ASSESSMENT OF SIMPLIFIED METHODS FOR EVALUATION OF STRESS INTENSITY FACTORS IN TUBULAR JOINTS

By

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PREFACE

There are two separate, but complementary, parts to this research. First is the analysis of uncracked tubular Y-joints using the 3D finite element method to obtain the stress concentration factor, degree of bending and hot-spot angle. The results are compared to parametric equations proposed by different authors. It is found that parametric equations proposed by Efthymiou and Smedley produce stress concentration factors in best agreement with the present finite element results.

The second part of this research involves analysis of tubular Y-joints with semi-elliptical cracks at the weld toe. The crack tips are modeled with collapsed hexagonal elements. Over a thousand joints have been analyzed. The stress intensity factors from the finite element analysis are then compared with stress intensity factors from simplified methods proposed by Haswell and BSI PD6493. It is found that both methods produce stress intensity factors on the high side of the present results. Haswell's method is simple to use, but is limited to an a/c ratio of 0.2 and tends to be overconservative for some joints. The method proposed by BSI is complicated to apply, but produces stress intensity factors that are in better agreement with the present results.

Based on the data available for Y-joints with an included angle of 60° and subjected to brace axial tension, a method as simple as Haswell's and as accurate as BSI's is proposed. The proposed method is a linear function that depends only on the stress concentration factor for the joint and the crack geometry.

ACKNOWLEDGMENTS

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This work is dedicated to my wife, Jye Yuann, and my daughter, Selena, for their love and trust over the years.

Finally, I wish to thank the School of Civil Engineering for supporting during the years of study.

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NOMENCLATURE

a	depth of crack
c	half length of crack
d	diameter of brace
D	diameter of chord
DoB	degree of bending
K	stress intensity factor
l	length of brace
L	length of chord
P	tension load along axis of brace
SCF	stress concentration factor
SIF	stress intensity factor
t	thickness of brace
T	thickness of chord
Y	stress correction factor
σ_{hs}	hot-spot stress
σ_n	nominal stress at brace end
θ	included angle between chord and brace
α	ratio of chord length to chord radius = 2L/D
β	ratio of brace diameter to chord diameter = d/D

γ ratio of chord radius to chord thickness = D/2T

τ ratio of brace thickness to chord thickness = t/T

CHAPTER I

INTRODUCTION

Nature of the Problem

Tubular members are the standard building components for jacket platforms used in the offshore oil industry. The weld toe area of a tubular joint is the most fatigue sensitive location. Defects at the weld toe often become sites for crack initiation and propagation. Fracture mechanics is a reliable technique for assessing the influence of these defects on structural behavior. Fracture mechanics is used to derive a stress intensity factor, which defines the stress field at the tip of the crack. Accuracy of the fatigue life calculation depends on the accuracy of the stress intensity factor solution.

Because of the complicated geometry of a tubular joint, it is difficult to calculate the stress intensity factor. There is no closed-form analytical solution available and experimental determination of the stress intensity factor is not possible. However, with the present development of computer hardware and software, computing stress intensity factors using 3D finite element methods is feasible.

Though using numerical methods to obtain stress intensity factors for tubular joints is feasible, it is also time consuming and requires practice, skill, and specialized software. One approach to making fracture mechanics analyses more generally accessible is to use finite element analyses for development of a database, from which parametric equations may be developed. These parametric equations may then be used for preliminary assessment of fatigue life.

Brief Review of Previous Research

Since no closed-form analytical solutions for stress intensity factors are available, some researchers have tried to solve the problem by modifying the solution for a flat plate. As computers became more powerful, others tried to solve the problem by numerical methods. However, these researchers usually modeled the tube wall and welds with thin or thick shell elements. Han[23] developed a more realistic model of the joint. Han modeled the tube wall, using the SESAM software package, with thin shell elements and an exact profile of the weld with solid elements. Using this model, cracks can be placed at the weld toe. A sensitivity analysis for different finite element models has been reported. The finite element model used in this research is very similar to the one suggested by Han.

Since there is no closed-form solution, simplified methods in the form of parametric equations are suggested by many authors. Some of these equations are very simple, such as the one suggested by Haswell[25]. Reliability of these methods has been studied only on a very small scale. A thorough comparison of these methods to "exact" finite element solutions is the major purpose of this research.

Objective of Study

A special 3D finite element package SESAM is used to analyze tubular Y-joints with/without semi-elliptical cracks at the weld toe. A typical Y-joint is shown in Figure 1. The nomenclature used follows the standard convention for the offshore industry. The joint is usually defined by its parameters, namely :

θ = included angle between chord and brace

α = ratio of chord length to chord radius = 2L/D

β = ratio of brace diameter to chord diameter = d/D

γ = ratio of chord radius to chord thickness = D/2T

τ = ratio of brace thickness to chord thickness = t/T

Parametric equations have been proposed by many authors[14,30,66,71] to calculate stress concentration factors for tubular joints. The first stage of this research is to analyze tubular joints without cracks. The data obtained is used to check the reliability of these parametric equations.

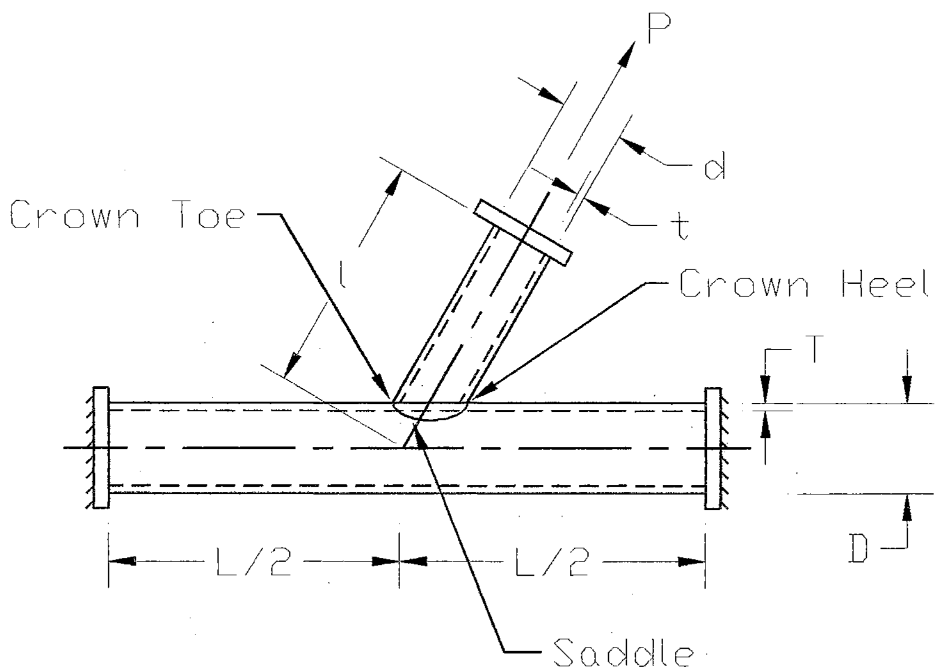


Figure 1. Geometry of Y-Joint

In the second stage of this research, joints with a semi-elliptical crack at the weld toe of the chord are analyzed by the finite element method. The results are compared to existing simplified methods. Also, a new simplified method is developed based on the data generated. The reliability of the new method is also examined.

Scope of Report

The first part of this report consists of Chapters 2 to 4, which describe the analysis of uncracked tubular joints. In Chapter 2, parametric equations most commonly used to calculate stress concentration factors are discussed. In Chapter 3, information is provided on analysis procedures. Chapter 3 also contains a detailed discussion of results. Chapter 4 focuses on comparisons of the present finite element results with the parametric equations.

The second part of this report consists of Chapters 5 to 7, which describe analyses of cracked tubular joints. Chapter 5 reports on analysis procedures for joints with semi-elliptical cracks at the weld toe. All three stress intensity factor modes for each joint analyzed are listed in Appendix D. Chapter 6 discusses existing simplified methods used to calculate stress intensity factors. The data obtained are used to check the accuracy of these methods. Finally, a new method is proposed in Chapter 7. This new method is simple yet has the same accuracy as the existing methods.

In the final chapter, conclusions are drawn based on the research results. Suggestions for future study are given.

CHAPTER II

PARAMETRIC EQUATIONS ON UNCRACKED JOINTS

Review of Parametric Equations

Before analyzing a cracked joint, the behavior of an uncracked joint should be understood. It is hoped that the stress intensity factor of a cracked joint can be related in some ways to the stress concentration factor of an uncracked joint. Therefore, the first part of this research will involve the analyses of uncracked joints and comparison with parametric equations commonly used in industry.

Several organizations have conducted finite element analyses on uncracked tubular joints. Based on their results, these organizations have proposed parametric equations to calculate stress concentration factors. Stress concentration factor is defined as the ratio of the maximum principal stress at the weld toe to the nominal stress at the brace end. The hot-spot is the location where the maximum stress concentration occurs. Following is a summary of parametric equations used to calculate the stress concentration factors at chord saddle or hot-spot locations for T- and Y-joints subjected to brace axial tension. Only the most commonly used equations are discussed in this report.

Kuang[38] at Exxon Production Research used a special finite element program called TKJOINT, developed at the University of California at Berkeley, to analyze T and TK-joints. In the program, by taking advantage of symmetry, only half of the joint was meshed using thin-shell elements. After 35 to 40 analytical solutions were obtained for each joint type, Kuang proposed parametric equations to calculate stress concentration factors in the chord and brace. Kuang did not specify the exact location of the hot-spot. The equation used to calculate stress concentration factors in the chord is listed in Appendix A.

In the Netherlands, Efthymiou and Durkin[14] analyzed tubular joints with a finite element package called PMBSHELL. PMBSHELL uses 16-node thick shell elements for the tube and 8-node thick shell elements for the weld. The stress concentration factors are based on maximum principal stresses linearly extrapolated to the weld toe. Their proposed parametric equation to calculate stress concentration factors at the chord saddle for T- or Y-joints with fixed chord ends and subjected to brace axial tension loading is listed in Appendix A. They also proposed equations to calculate stress concentration factors at other locations such as the chord crown, brace saddle and crown. For more complex joints, Efthymiou[15] suggested that stress concentration factors can be obtained by combining the basic joints through an influence function.

In University College London, Dover and Sutomo led a research program in which approximately 900 joints were analyzed using thin-shell finite-element models. Hellier, Connolly and Dover[30] provide equations to calculate position of hot-spot stress sites and sets of equations to calculate stress concentration factors along the weld-toe. The equation to calculate stress concentration factors at the chord hot-spot is listed in Appendix A. Connolly, Hellier, Dover and Sutomo[7] also proposed parametric equations to calculate the degree of bending. Degree of bending is defined as the ratio of bending stress component to total stress at the hot-spot.

Lloyd's Register of Shipping, U.K. has also conducted research on tubular joints. Scaled models built from acrylic tubes were tested, and the peak stress was investigated by using brittle lacquer and strain gages. Wordsworth and Smedley[71] proposed an equation to calculate stress concentration factors at the chord saddle for T- and Y-joints under brace axial load. Later, Smedley and Fisher[66] proposed a set of refined equations to calculate stress concentration factors at the saddle and crown for T- and Y-joints under brace axial load.

All the above mentioned parametric equations are list in Appendix A. The valid range of parameters used in the these parametric equations varies slightly for different authors. They are summarized in Table A1 in Appendix A.

Comparison of SCF Among Parametric Equations

Values of stress concentration factors based on parametric equations proposed by authors discussed above are plotted in Figures 2 through 5 for comparison. In the figures, the stress concentration factors are all located on the chord side, either at its hot-spot or saddle depending on the parametric equations. The γ value for all four figures is kept at 20. Figure 2 shows the case when θ and β are both small. The parameter θ is the included angle between the brace and chord. A small β value means that the brace diameter is small relative to the chord diameter. In this case, stress concentration factors predicted by all authors agree very well with each other.

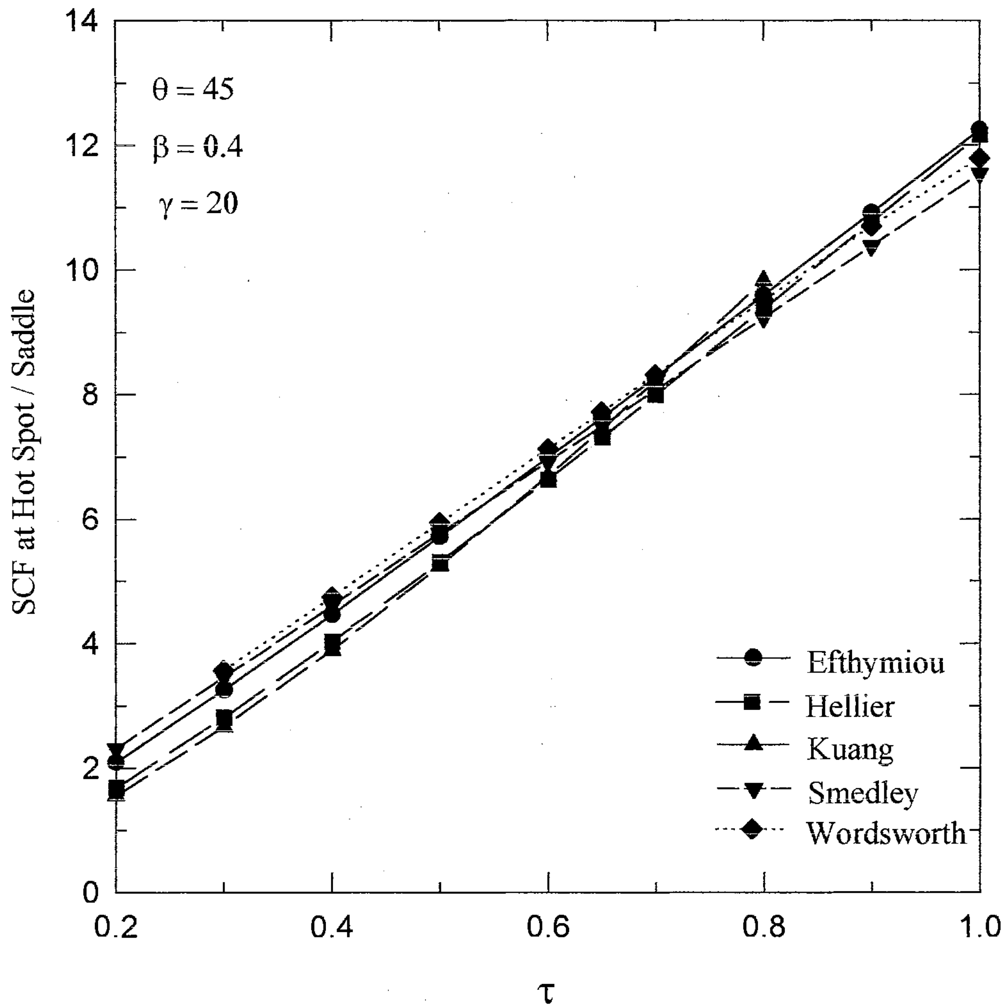


Figure 2. Comparison Among Parametric Equations for θ=45, β=0.4 & γ=20

When β increases, i.e., when the diameter of the brace is comparatively large, differences in the equations increase, and Kuang's equation provides the lowest stress concentration factors. In Figure 3, the β is increased to 0.8, as compared with 0.4 in Figure 2.

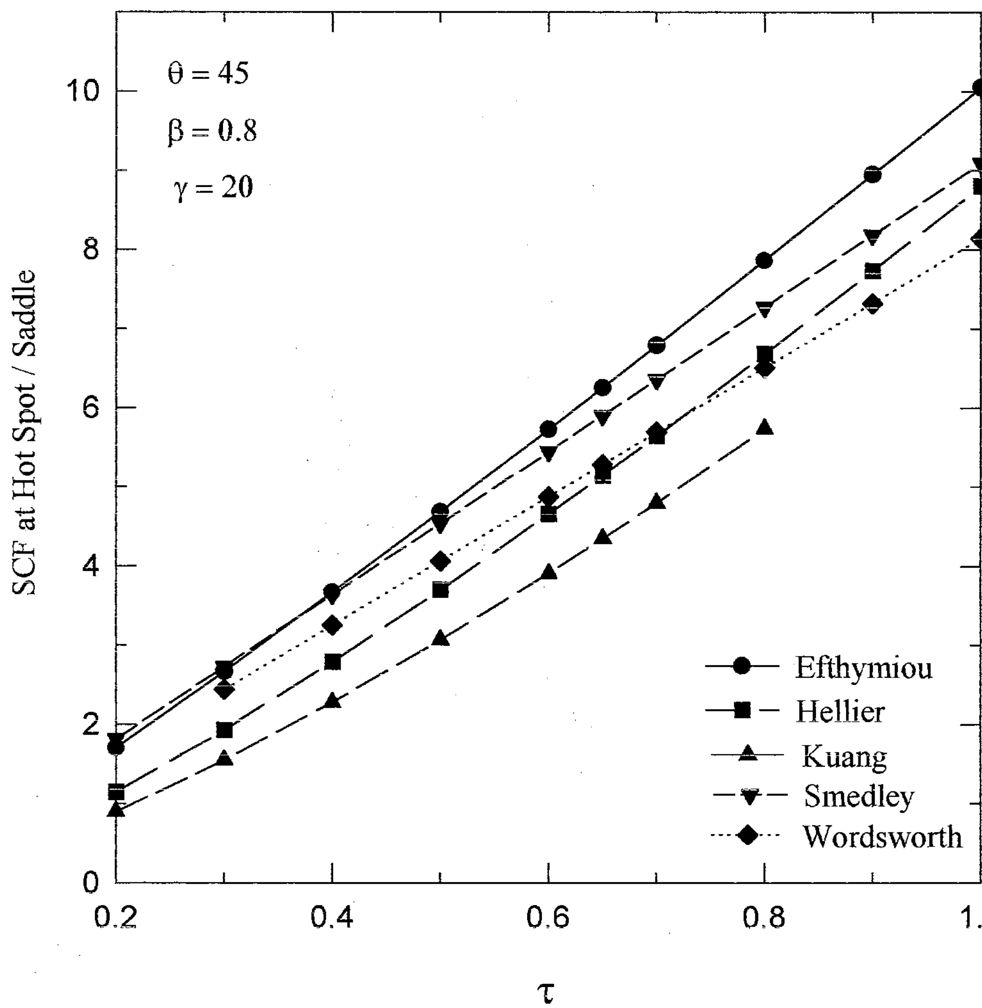


Figure 3. Comparison Among Parametric Equations for θ=45, β=0.8 & γ=20

In Figures 4 and 5, β and γ are kept the same as in Figure 3 but θ is increased from 45° to 60° and 90° respectively. Stress concentration factors based on Kuang's equation again give the lowest value.

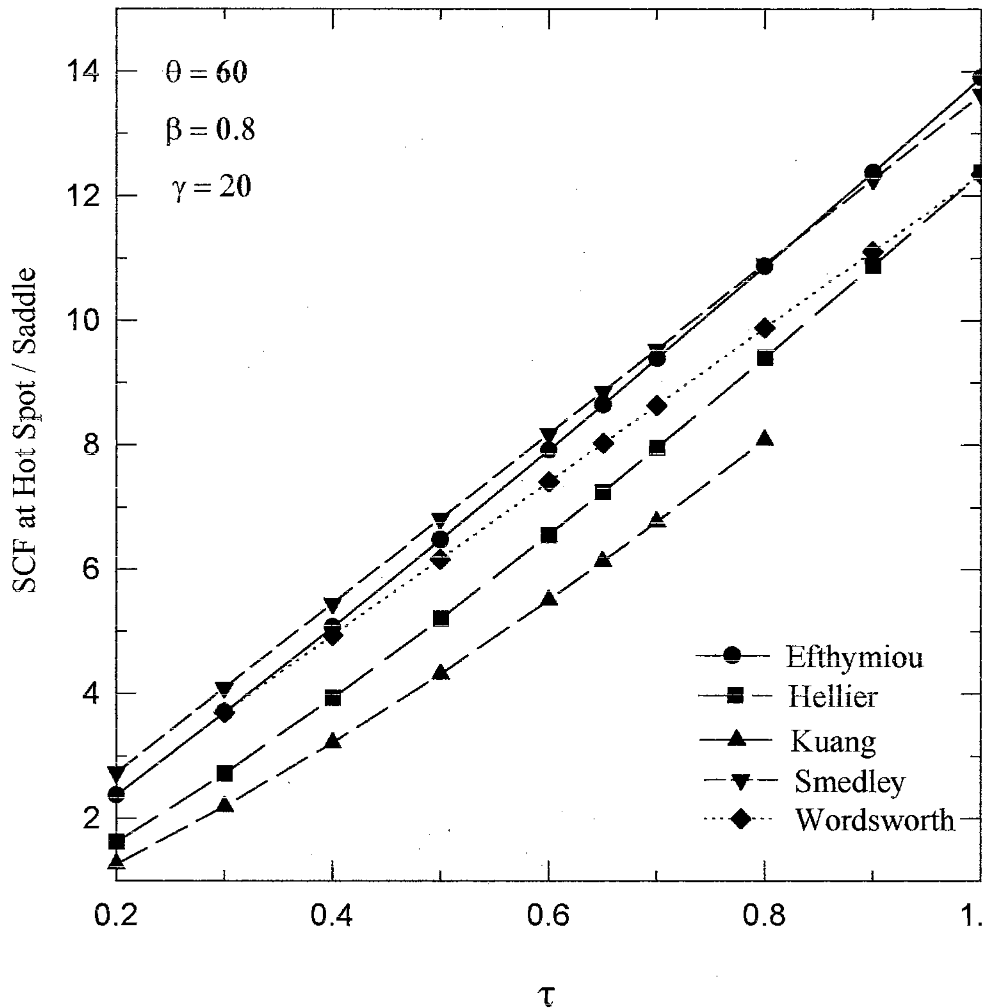


Figure 4. Comparison Among Parametric Equations for θ=60, β=0.8 & γ=20

In Figure 5, θ is increased to 90°. Differences between equations remain consistent for θ's of 45°, $60^{\circ}$and 90°. Kuang's equation continues to provide the lowest value.

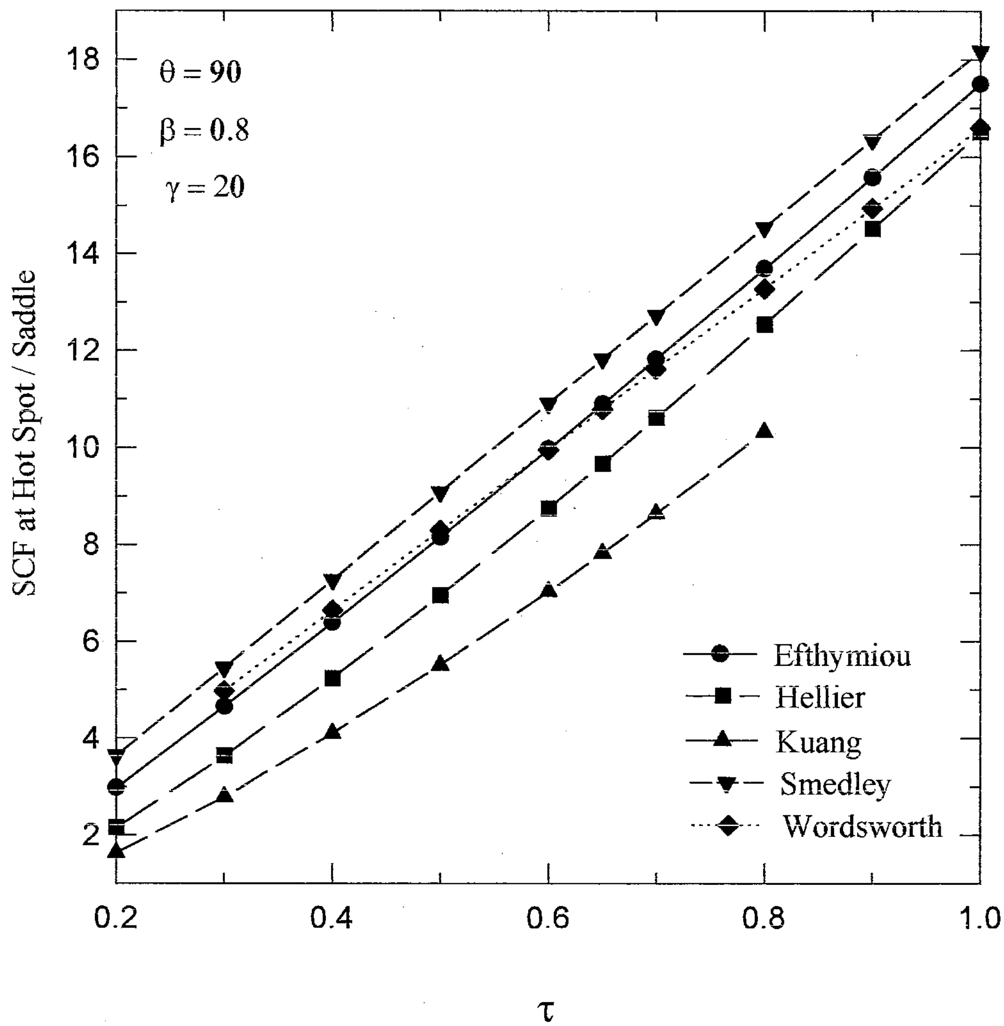


Figure 5. Comparison Among Parametric Equations for θ=90, β=0.8 & γ=20

As a conclusion, Kuang's equation always produces the lowest stress concentration factor, especially when the values of the parameters are large. The stress concentration factors given by Efthymiou, Hellier, Smedley and Wordsworth tend to overlap and exhibit similar trends. Actually, Smedley and Wordsworth developed their parametric equations based on some common experimental data; Smedley's equations are refined version of Wordsworth's equations. Therefore, only Efthymiou, Hellier and Smedley's equations will be considered in future comparisons. They are the most commonly used parametric equations in the industry. No matter which author's equations are used, they will produce very similar results.

Effect of Joint Parameters on Stress Concentration Factors

Effect of α on SCF

Comparing parametric equations proposed by Efthymiou, Hellier and Smedley, only Hellier's equation contains the parameter α. Its effect on the stress concentration factor is negligible since the term α in Hellier's equation is raised to a very small power.

Effect of τ on SCF

This is the main parameter that affects stress concentration factors. As seen from the preceding figures, stress concentration factors increase with increasing τ. Both Wordsworth and Smedley's equations show that stress concentration factor is linearly proportional to τ. For Efthymiou and Hellier, τ is expressed as a complicated function in the equations, but shows up as a straight line in the figures. For joints of same chord dimension, an increase in τ means an increase in the wall thickness of the brace, or a higher stiffness for the brace. The strong brace will cause the chord to deform more, thus resulting in higher stress concentrations on the chord side.

Effect of θ on SCF

When the included angle θ increases, the stress concentration factor at the hot spot also increases. Therefore, a T-joint gives the highest stress concentration factor. Figure 6 shows the variation of stress concentration factors against θ. This figure is drawn based on Efthymiou's equation. The same trend is obtained with equations from other authors.

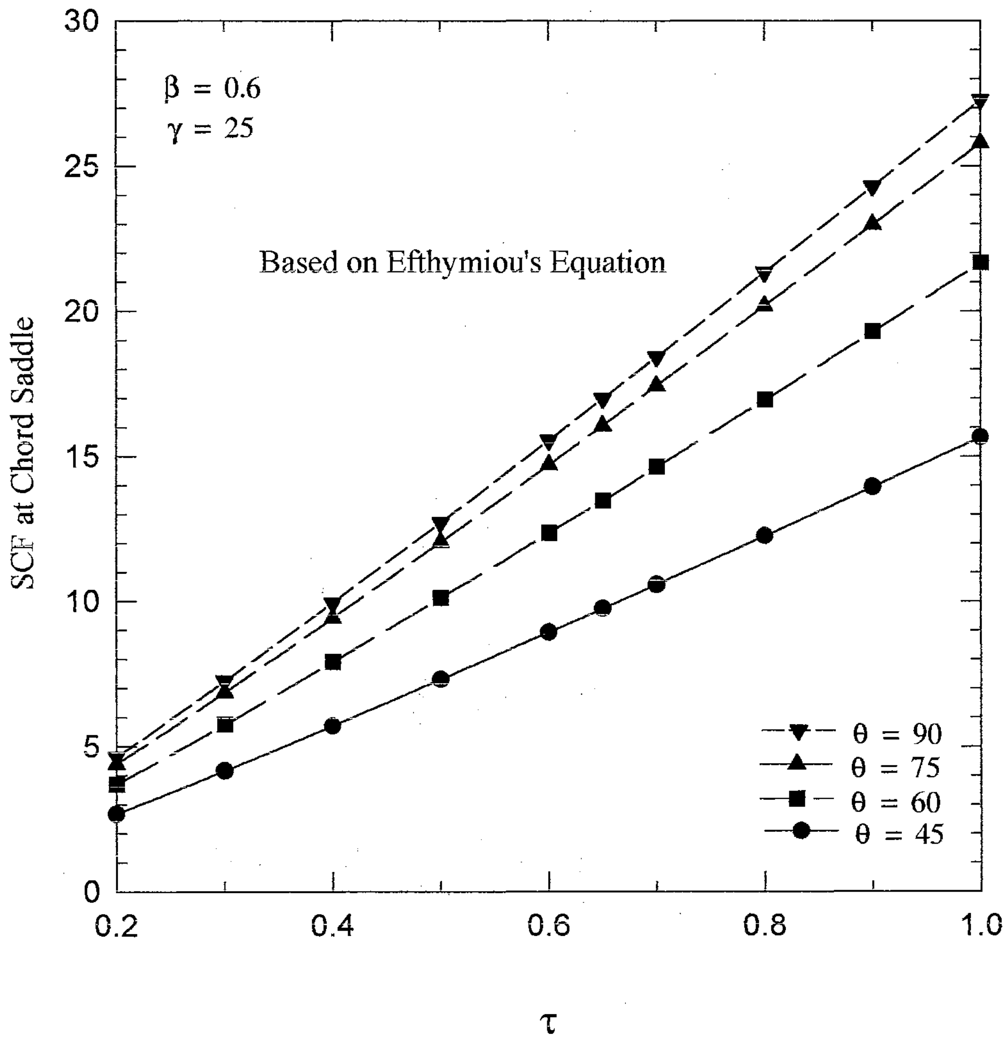


Figure 6. Effect of θ on SCF

Effect of γ on SCF

A reduction in γ means an increase in the wall thickness of the chord. As shown in Figure 7, which is based on Hellier's equation, increasing the wall thickness of the chord will reduce the stress concentration factors. A strong chord wall will lessen the deformation in the chord, thus reducing its stress concentration.

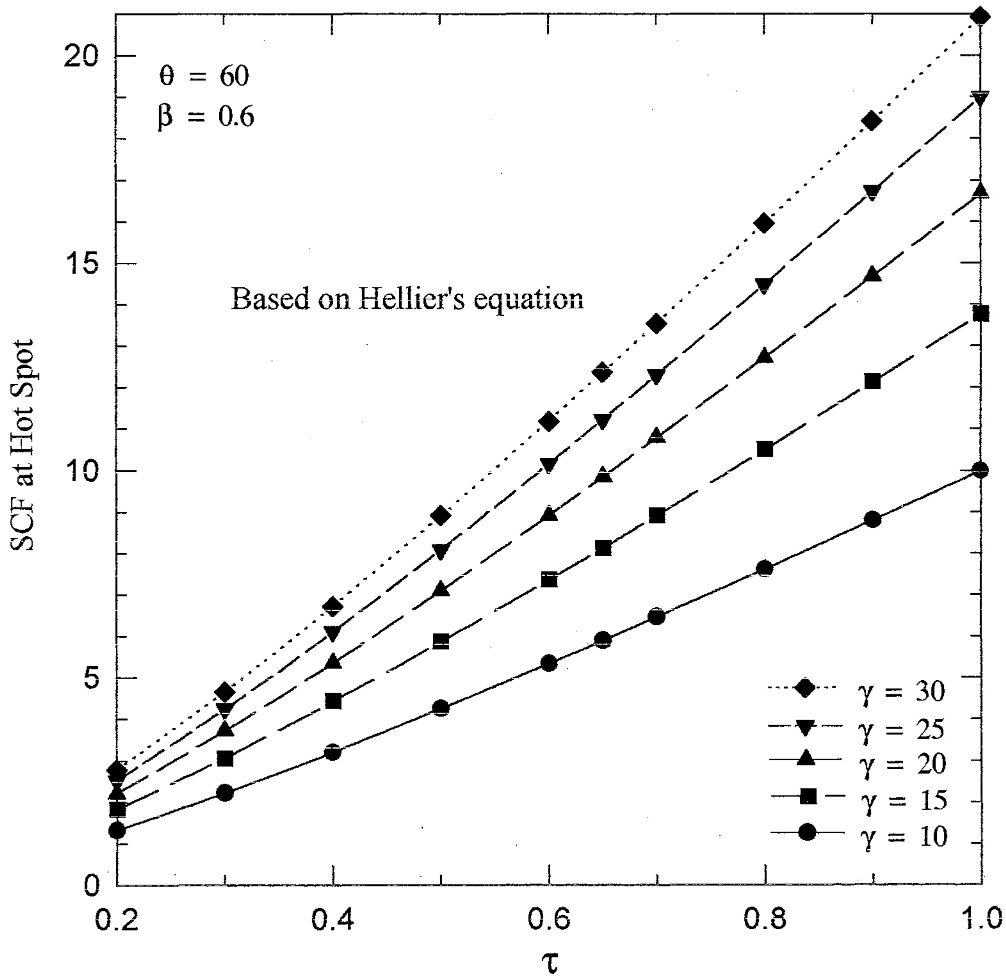


Figure 7. Effect of γ on SCF

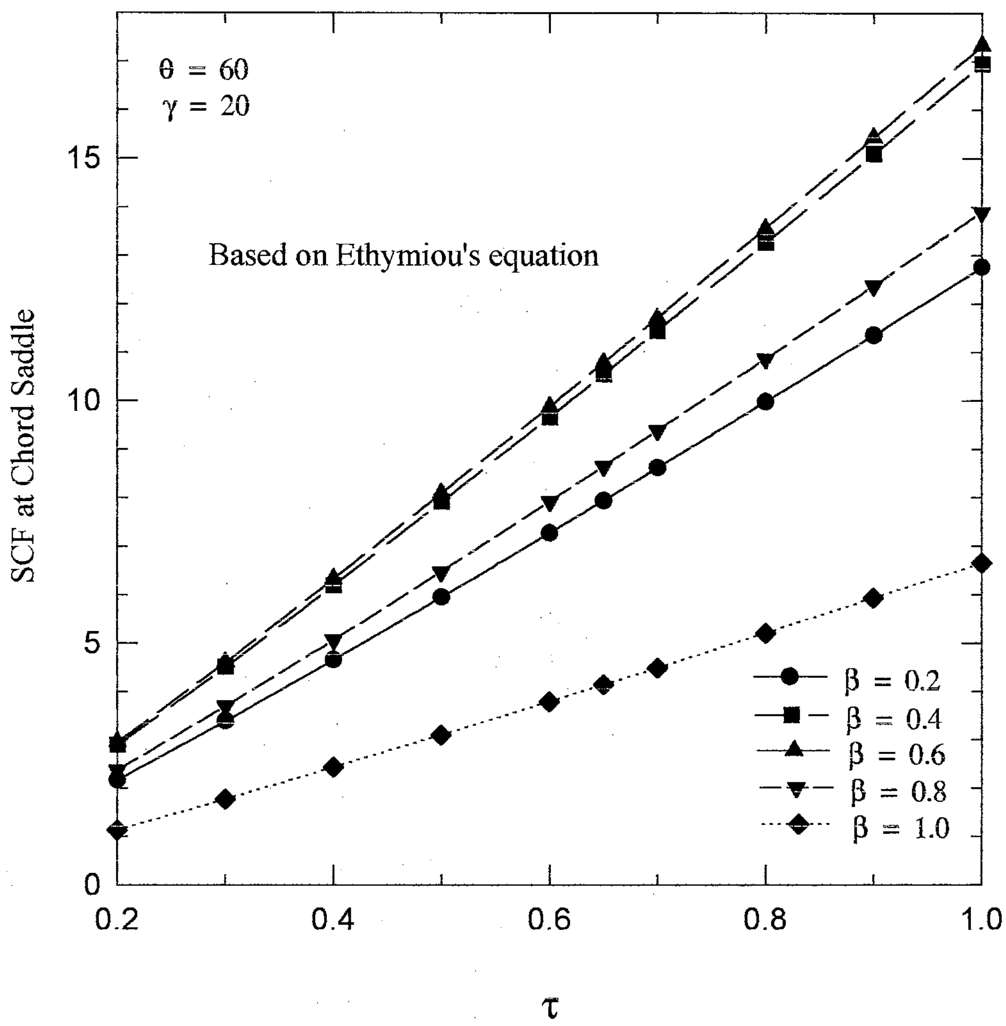


Figure 8. Effect of β on SCF based on Efthymiou's Equation

Effect of β on SCF

Figures 8 and 9 show that an increase in β will increase the stress concentration factor, except when β is larger than 0.6. As β approaches 1.0, the diameter of the brace approaches the diameter of the chord. Only Efthymiou and Wordsworth/Smedley claim that their valid range for β extends up to 1.0. When the diameter of the brace approaches the diameter of the chord, the profile of the weld is different from the standard weld profile. This causes the drop in stress concentration factors.

Figure 8 is drawn based on Efthymiou's equation, while Figure 9 is based on Smedley's equation. Both figures show that when β is larger than 0.6, the stress concentration factors start to drop.

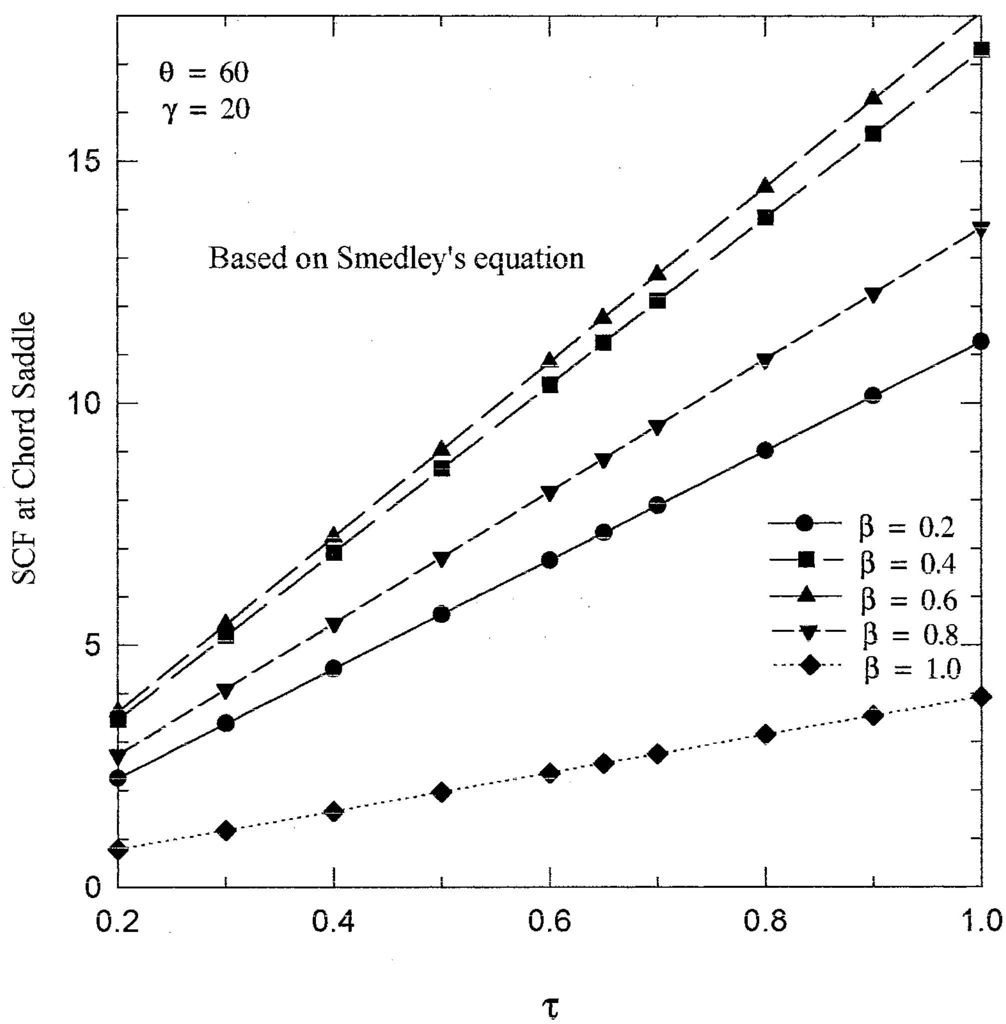


Figure 9. Effect of β on SCF based on Smedley's Equation

Effect of Joint Parameters on Degree of Bending

Only researchers in University College London have proposed parametric equations to calculate the degree of bending at the hot-spot. Degree of bending is defined as the ratio of the bending stress component to the total stress. The effect of the joint parameters on the degree of bending is studied based on these equations.

Effect of α on DoB

As seen from the equation for degree of bending in Appendix A, α is raised to a very small power. Therefore, its effect on degree of bending is negligible. When the value of α increases four fold, from 6 to 36, the degree of bending increases only 4%.

Effect of τ on DoB

For all values of θ, γ, and β, degree of bending increases with increasing τ. A large τ means a brace with thick walls. When the stiffness of the brace is large compared to that of the chord, the result is more deformation on the chord side under external loads. This excess deformation will induce higher internal moments.

Effect of θ on DoB

As shown in Figure 10, degree of bending decreases with increasing included angle θ. However, when θ is larger than 60°, the rate of decrease is very small. A T-joint has the lowest degree of bending. The same results are obtained for other values of β and γ.

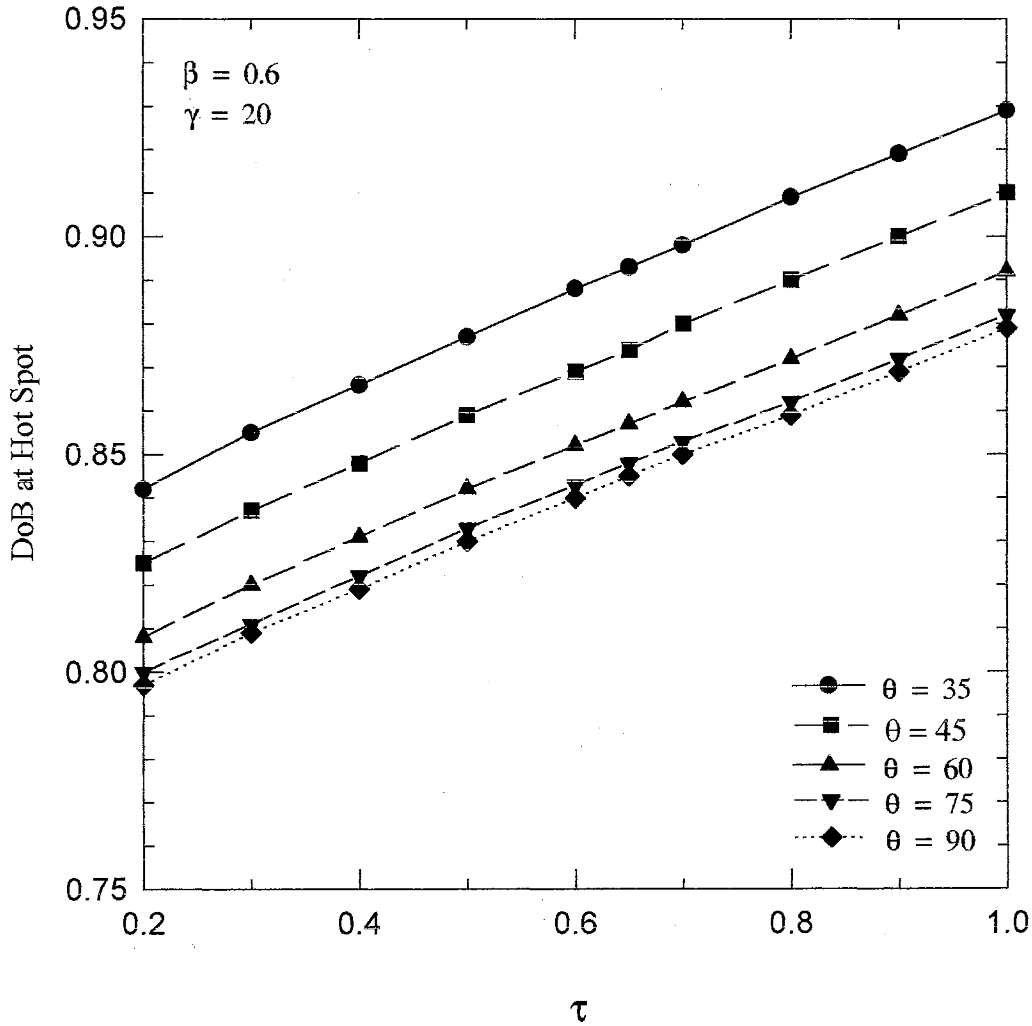


Figure 10. Effect of θ on DoB for Y-joints Subjected to AT

Effect of γ on DoB

Degree of bending increases with increasing γ. A small γ means thick chord walls. When the chord-wall thickness increases, degree of bending decreases. This is due to the increase in stiffness of the chord. The effect is opposite to that of increasing τ.

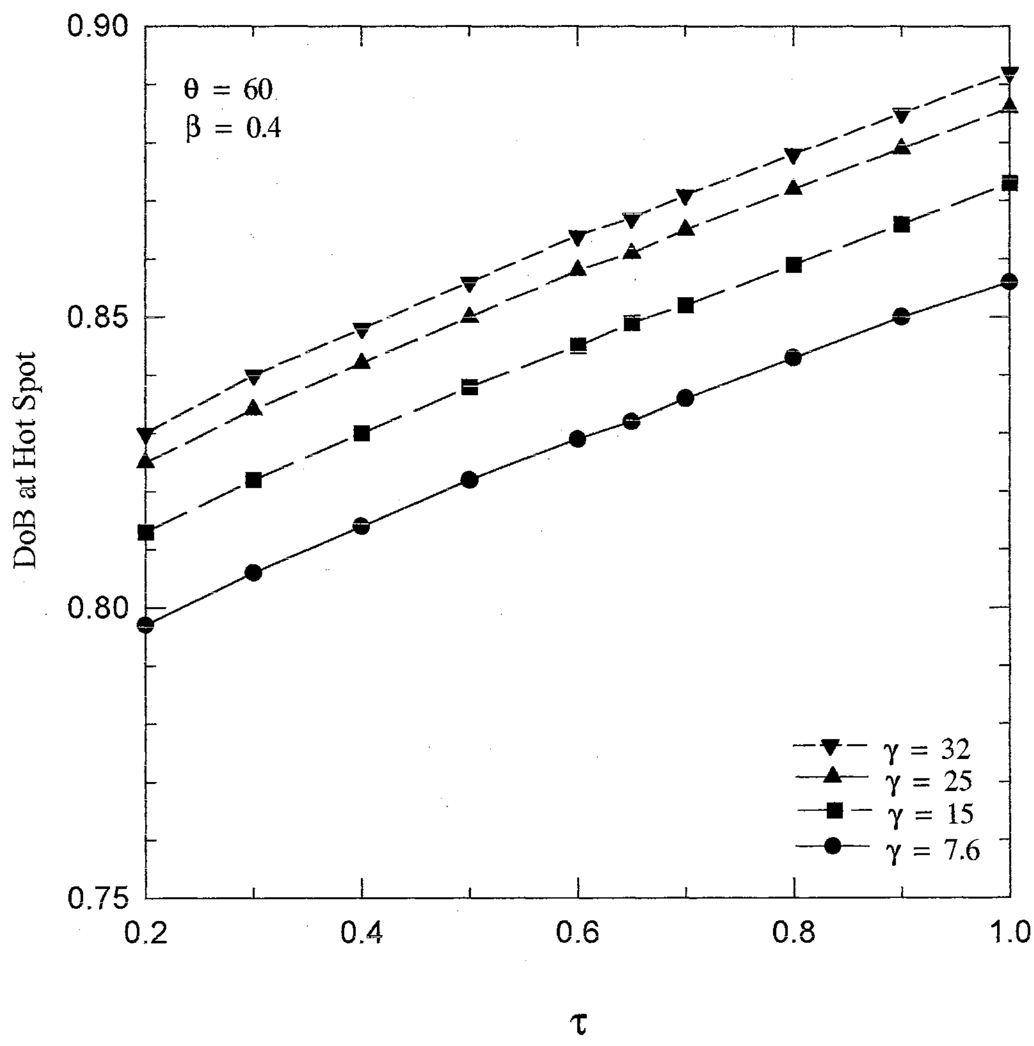


Figure 11. Effect of γ on DoB for Y-joints Subjected to AT

Effect of β on DoB

The effect of β on degree of bending is very complex. From Figure 12 and Figure 13, no definite trend for degree of bending can be drawn.

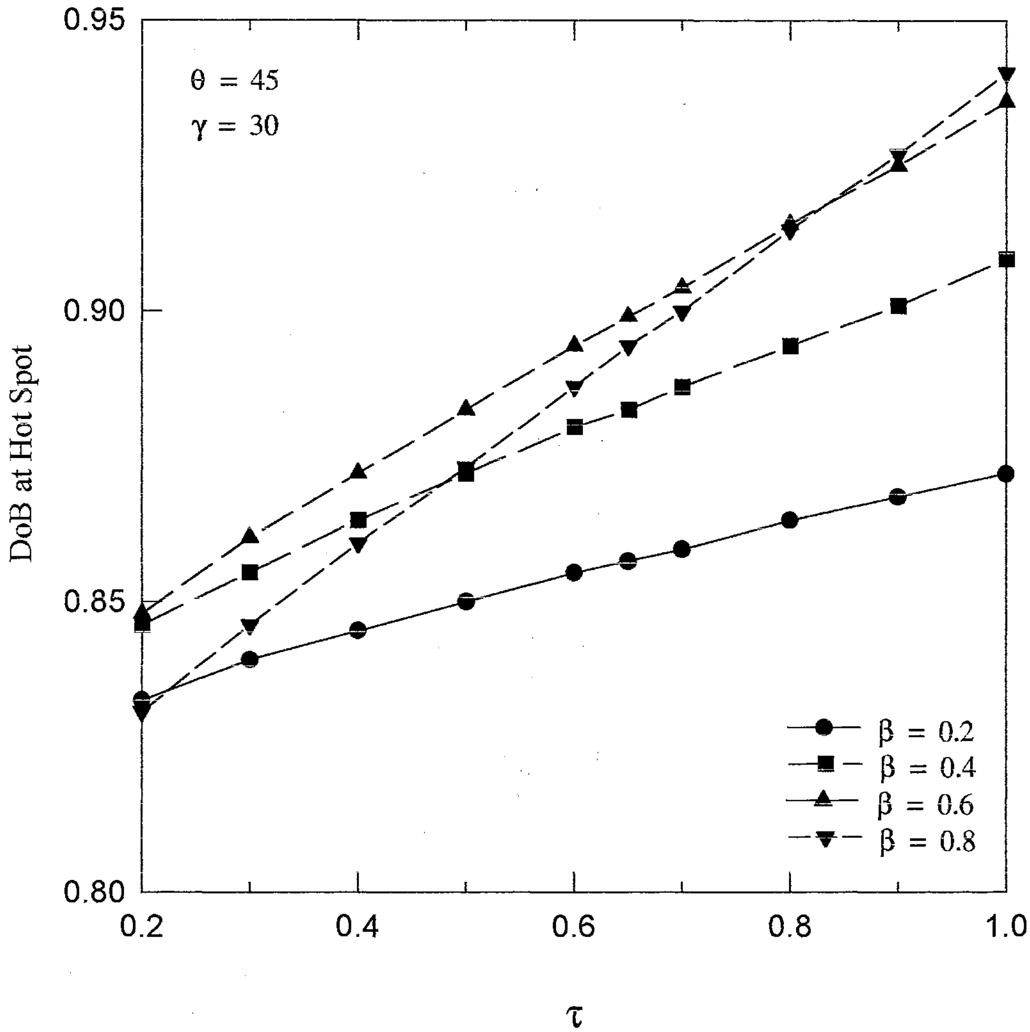


Figure 12. Effect of β on DoB for Y-joints Subjected to AT for θ=45 & γ=30

Figure 12 is drawn for joints with $\theta = 45^{o}$ and $\gamma = 30$. Except when β is larger than 0.6, degree of bending increases with increasing β. However, for other θ and γ values, such as shown in Figure 13, with $\theta = 75^{\circ}$ and $\gamma = 10$, degree of bending decreases with increasing β.

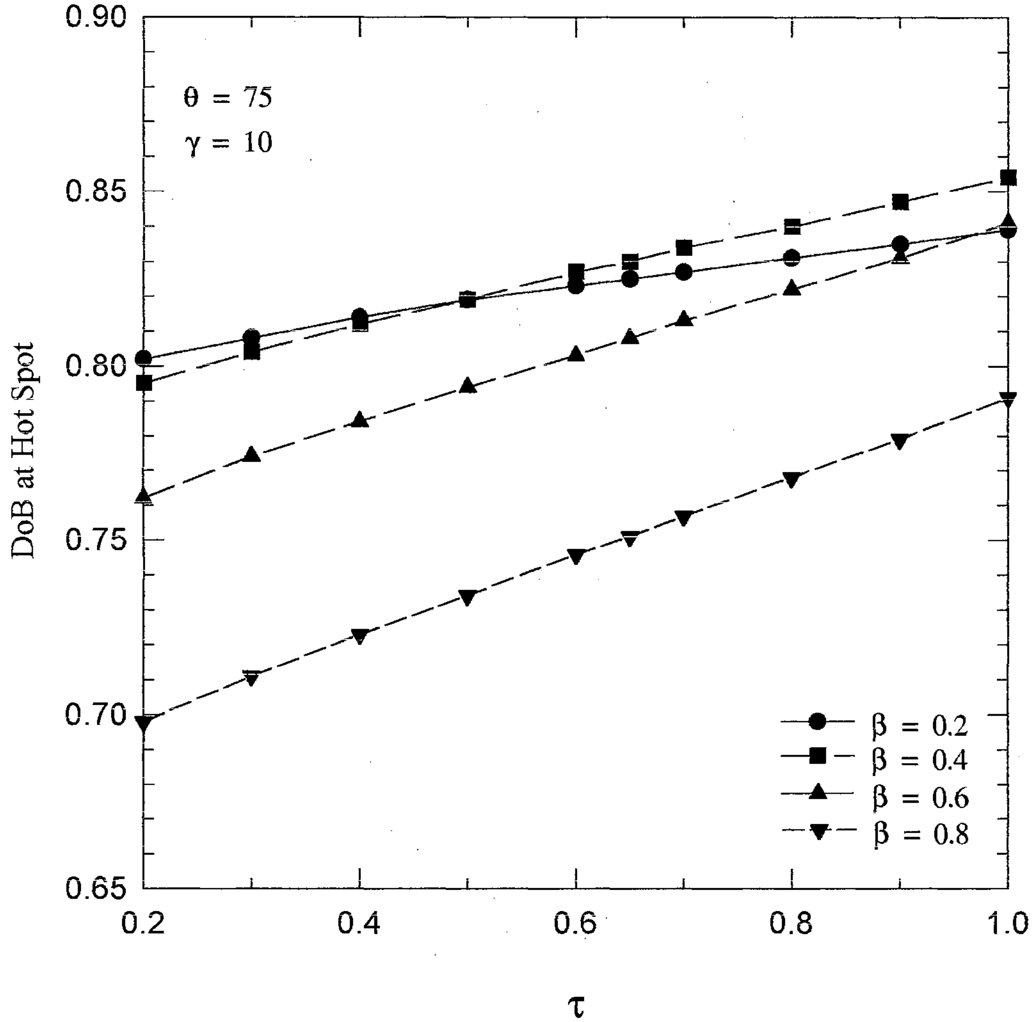


Figure 13. Effect of β on DoB for Y-joints Subjected to AT for θ=75 & γ=10

According to Connolly's equation, for Y-joints subjected to brace axial tension, the range of degree of bending in the chord is between 0.671 to 0.969, with most joints having values between 0.8 to 0.9. Stresses in the chord wall are therefore composed mostly of bending stress.

Table 1

Parameters for Minimum and Maximum DoB

	Valid Range	Min. DoB	Max. DoB
DoB		0.671	0.969
θ	35°-90°	90°	35°
α	>=6.21	12	12
β	0.2-0.8	0.8	0.8
γ	7.6-32	7.6	32
τ	0.2-1.0	0.2	1.0

The parameters where the maximum and minimum degree of bending occur are shown in Table 1. Also shown in the table are the valid range of parameters. It is seen that the maximum and minimum degrees of bending occur at the extreme values of the parameters except β. Both maximum and minimum degrees of bending occur at the same β value of 0.8. Therefore, there is not a definite trend on how the parameter β effects the degree of bending.

CHAPTER III

ANALYSIS OF UNCRACKED JOINTS BY

3D FINITE ELEMENT METHOD

Finite Element Modeling

All tubular joints in this research are analyzed using the finite element package SESAM which is divided into several modules with each doing a specific task. The modules and their tasks are:

PREFEM	Preprocessor for general finite element programs.
PRETUBE	Finite element preprocessor for tubular joints.
SESTRA	Super element structural analysis.
PREPOST	Utility program for data conversion.
POSTFEM	General finite element graphics postprocessor.
POSTSIF	Linear fracture mechanics analysis.

The complete package of SESAM is installed on an IBM RS/6000 work station. Immediately after the installation, examples delivered with each module were test-run. The results were compared with delivered output to ensure proper installation of each module. For modules PREFEM, PRETUBE and POSTFEM, results were also checked by graphic display.

SESAM is very complicated software. For someone not familiar with the software, to learn the way each module runs and to master the basic commands in each module requires approximately five weeks with forty hours per week. For one who has some basic computing background, it is still not difficult to learn to use the program.

Once a basic understanding of the whole package was achieved, the author developed a set of standard input files for each module in order to minimize the input effort. For each joint analyzed, one has only to change the joint geometry, boundary conditions and loadings in the input file for PRETUBE. Then each module can be run in the background with the appropriate input files to minimize the time spent in front of the screen.

Finite Element Mesh

The finite element model for the whole joint is generated using PRETUBE. The chord and brace are modeled using 8-node shell elements, the welds are modeled using 20-node solid elements with a profile according to the AWS specification, and 15-node transition elements are inserted between the shell and solid elements. The finite element mesh of a typical Y-joint is shown is Figure 14. SESAM applies the concept of super-elements to minimize calculating time and to optimize use of hardware. In PRETUBE, the chord and the chord plug are modeled automatically using one super-element for each. To form a better mesh, the brace must be divided manually into two super-elements. The weld is then divided automatically into two super-elements.

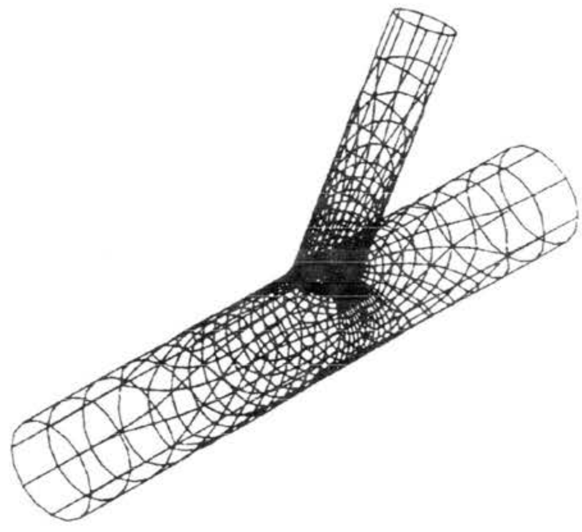


Figure 14. Finite Element Mesh Model

Computing Procedure

The first step is to generate the finite element mesh for the joint using the module PRETUBE. One can do that by following the steps suggested in the manual. A more simple way is to change the joint data in the input file developed by the author. The data includes the chord and brace dimensions, and types of loading used. Then the finite element mesh for the whole joint is generated using PRETUBE, which will also produce a data file for each super-element. These data files are used as input files for SESTRA, which will perform the tasks of numerical analysis. PREPOST is used to convert the output results from SESTRA for graphic presentation. POSTFEM will present the results in graphics, such as the displacements and stress fields. The results of some particular elements can be pulled out and written to a file by POSTFEM. Using POSTFEM, the nodal stresses for those elements around the weld toe can be extracted. The author wrote a program in Fortran to extract the stresses for the nodes around the weld toe, and calculate the stress concentration factors and degree of bending from these extracted data.

Stress Distribution Around the Weld Toe

The stress at the weld toe is expressed by the non-dimensional stress concentration factor. The stress concentration factor is the ratio of the maximum principal stress, regardless of its direction, to the nominal stress at the brace end. The maximum principal stress is calculated from the stress components of the node at the weld toe. They are not obtained by extrapolating to the weld toe. For brace axial tension loading, the nominal stress, σ_n, is defined as the loading in the brace divided by the cross-sectional area of the brace, i.e.

$$\sigma_n = \frac{P}{\pi\left[d^2 - (d-2t)^2\right]/4}$$

where P = axial tension in the brace,

d = diameter of the brace, and

t = thickness of the brace.

The stress concentration factors on the chord side around the weld toe for a series of joints are shown in Figure 15. The figure shows joints with the same chord size and brace diameter but different brace thickness. The stress variation for each joint is represented by a curve in the figure.

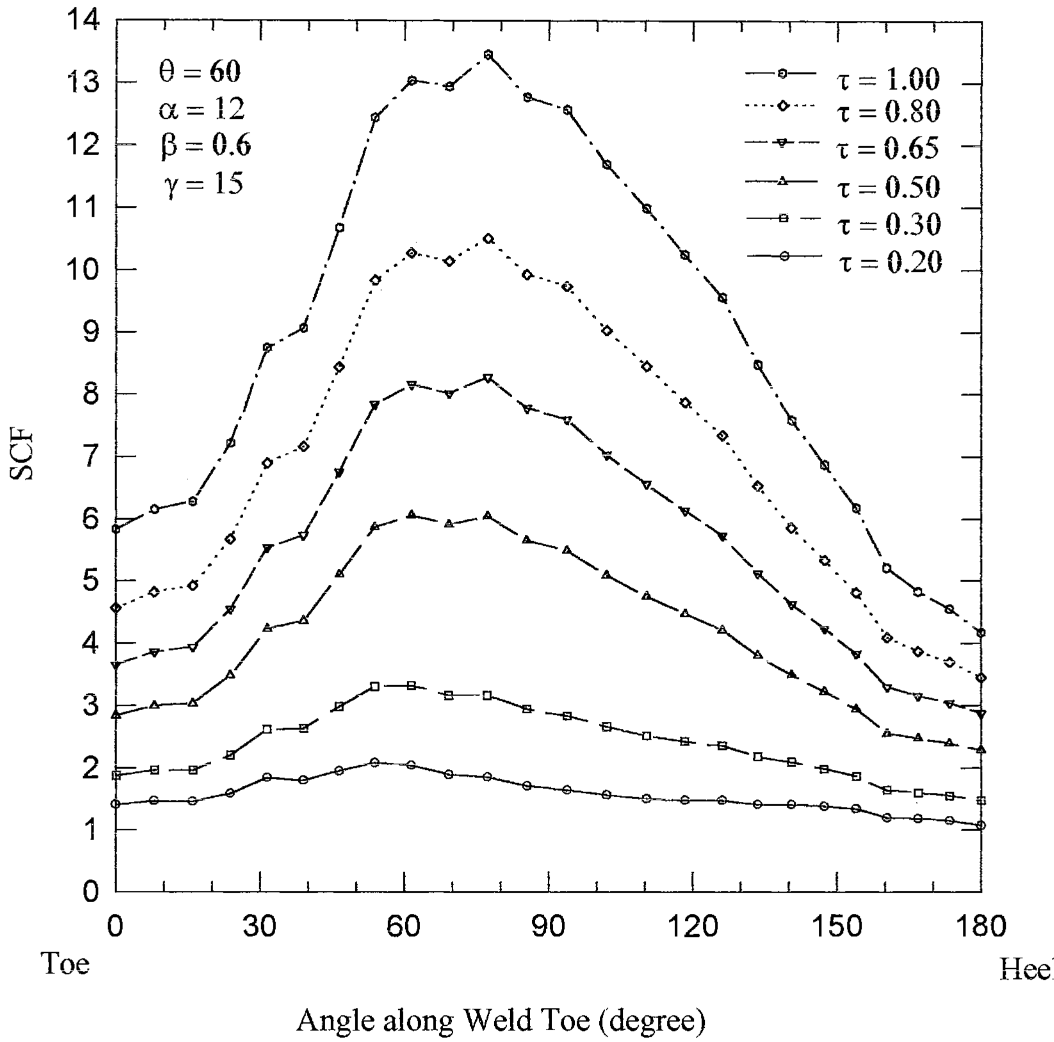


Figure 15. SCF Distribution at Weld Toe on Chord Side

The hot-spot angle is the angle at which the maximum stress concentration factor is located. The hot-spot angles mentioned in this report are all measured from the crown toe. The saddles of these joints are all located at 86.3°, but the hot-spot is not on the same location as the saddle. The hot-spot shifts slightly towards the crown toe. As the brace thickness reduces, the hot-spot shifts closer to the crown toe and becomes less obvious.

Stress Variation Through the Wall Thickness

Figures 16 and 17 show the variation of stresses through the chord wall-thickness for joints with β=0.6 and β=0.8 respectively. The stresses are expressed in terms of stress concentration factors. Joints for both figure have the same dimensions, except for the brace diameter. Comparison of Figures 16 and 17 shows that the through-thickness stress variation at different locations along the weld toe is similar for the two joints.

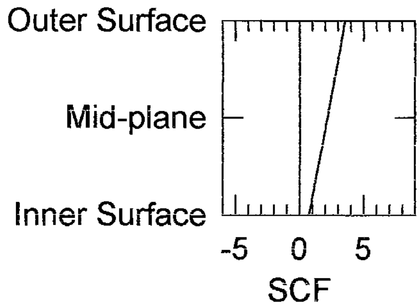
Degree of bending is defined as the ratio of bending stress to total stress, i.e.

$$DoB = \frac{\sigma_b}{\sigma_b + \sigma_m}$$

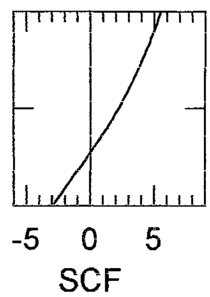
where σ_b = bending stress component, and

σ_m = membrane stress component.

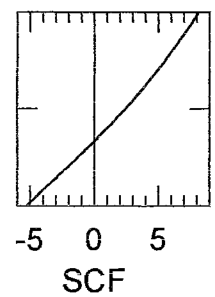
Thus, degree of bending can be calculated from the through-thickness stress concentration factors. In doing so, the stress through the wall thickness is assumed to be linear, though it is slightly nonlinear as shown in Figures 16 and 17. The value of the degree of bending mentioned in this report refers to the one that is located at the hot-spot.



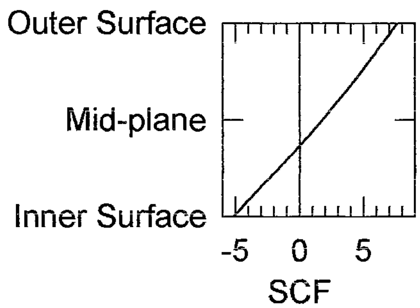
(a) At $\phi = 0^{O}$ (Toe)



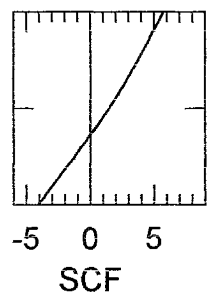
(b) At $\phi = 30^{O}$



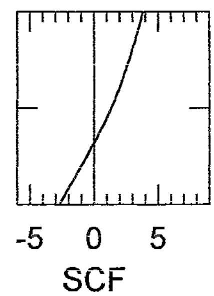
(c) At $\phi = 60^{O}$



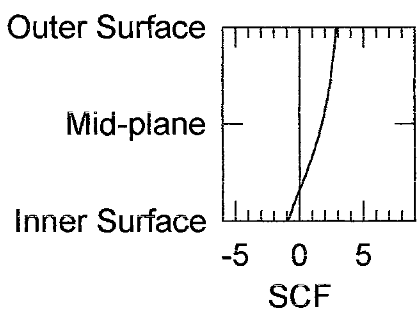
(d) At $\phi = 90^{O}$



(e) At $\phi = 120^{O}$



(f) At $\phi = 150^{O}$



(g) At $\phi = 180^{O}$ (Heel)

Note: $\alpha = 12$
$\theta = 60^{o}$
$\beta = 0.6$
$\gamma = 15$
$\tau = 0.65$

Figure 16. Variation of Stresses Through Chord Wall Thickness for β=0.6

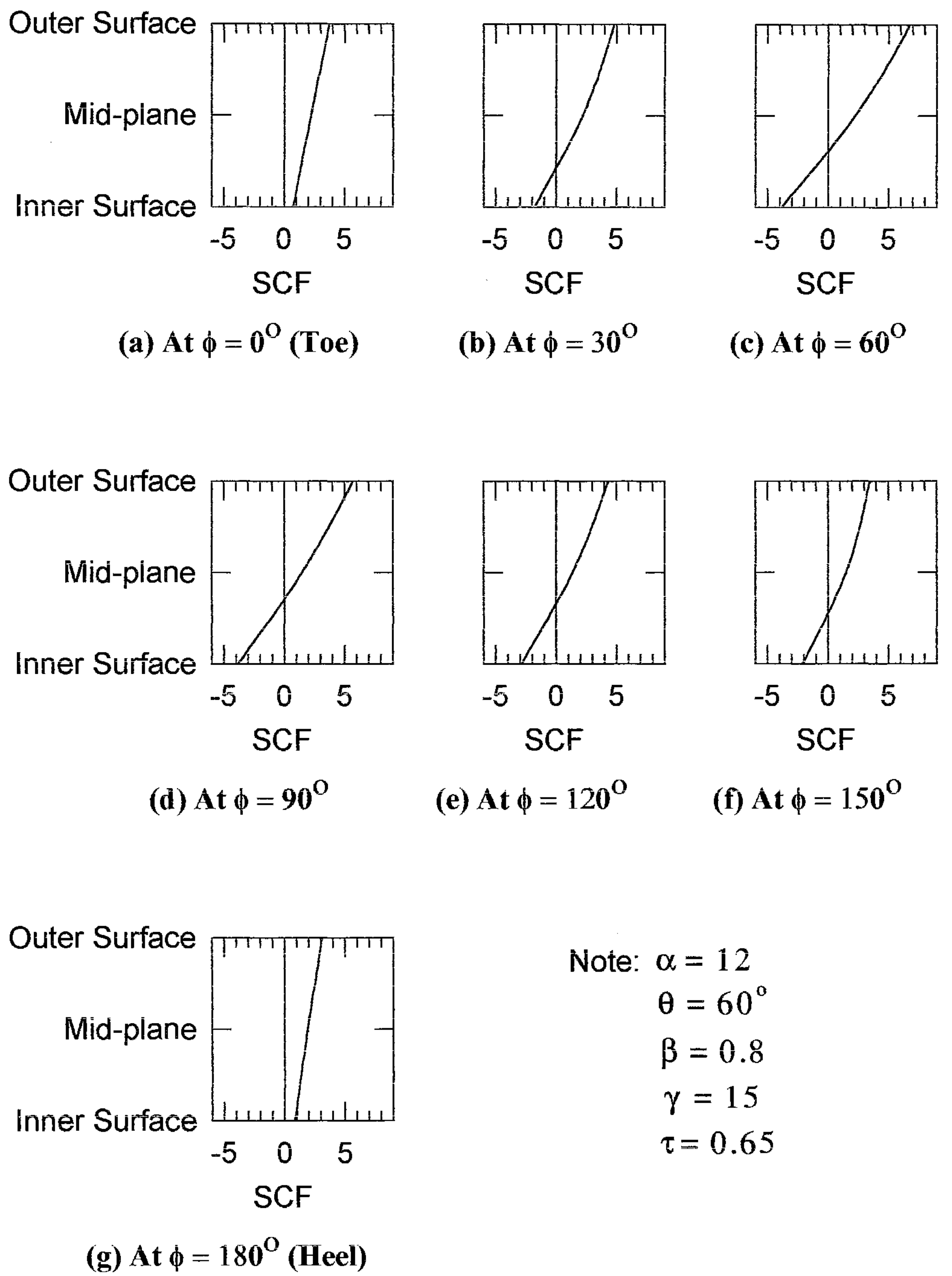


Figure 17. Variation of Stresses Through Chord Wall Thickness for β=0.8

Effect of Types of Elements Used Around Weld Toe

In the preceding discussion, the weld was modeled with 20-node solid elements and the tube wall was modeled with 8-node shell elements. A row of 15-node transition elements was placed between the solid and shell elements. In order to study the effect of the element type on stresses at the weld toe, two other forms of modeling was used. First, the row of 15-node transition elements was changed to 20-node solid elements which were then connected directly to the shell elements. Second, the solid elements of the weld were connected to a row of 20-node solid elements, followed by a row of 15-node transition elements. The result of these three types of meshing are show in Figure 18.

In the figure, there is not much difference between the model using a row of brick elements only and the model using a row of transition elements only. However, for the model using a row of brick elements followed by a row of transition elements, a lower value of stress concentration factor is obtained. This is due to the increase in rigidity caused by the addition of an extra row of solid elements beside the weld.

The figure also shows a comparison with values calculated from parametric equations. Efthymiou[14] and Smedley[66] provide equations to calculate the stress concentration factor at the saddle. Hellier[30] provides a set of equations to calculate the stress concentration factors along the weld toe. Han[23] has analyzed a similar joint. The stress concentration factors from these authors are shown in the figure for comparison. The maximum stress concentration factors agree very well with each other. The model using only a row of 15-node transition elements between the solid and shell elements gives the result closest to all the other values. Therefore, in the remainder of this report, all joints are analyzed using a row of 15-node transition elements around the weld toe.

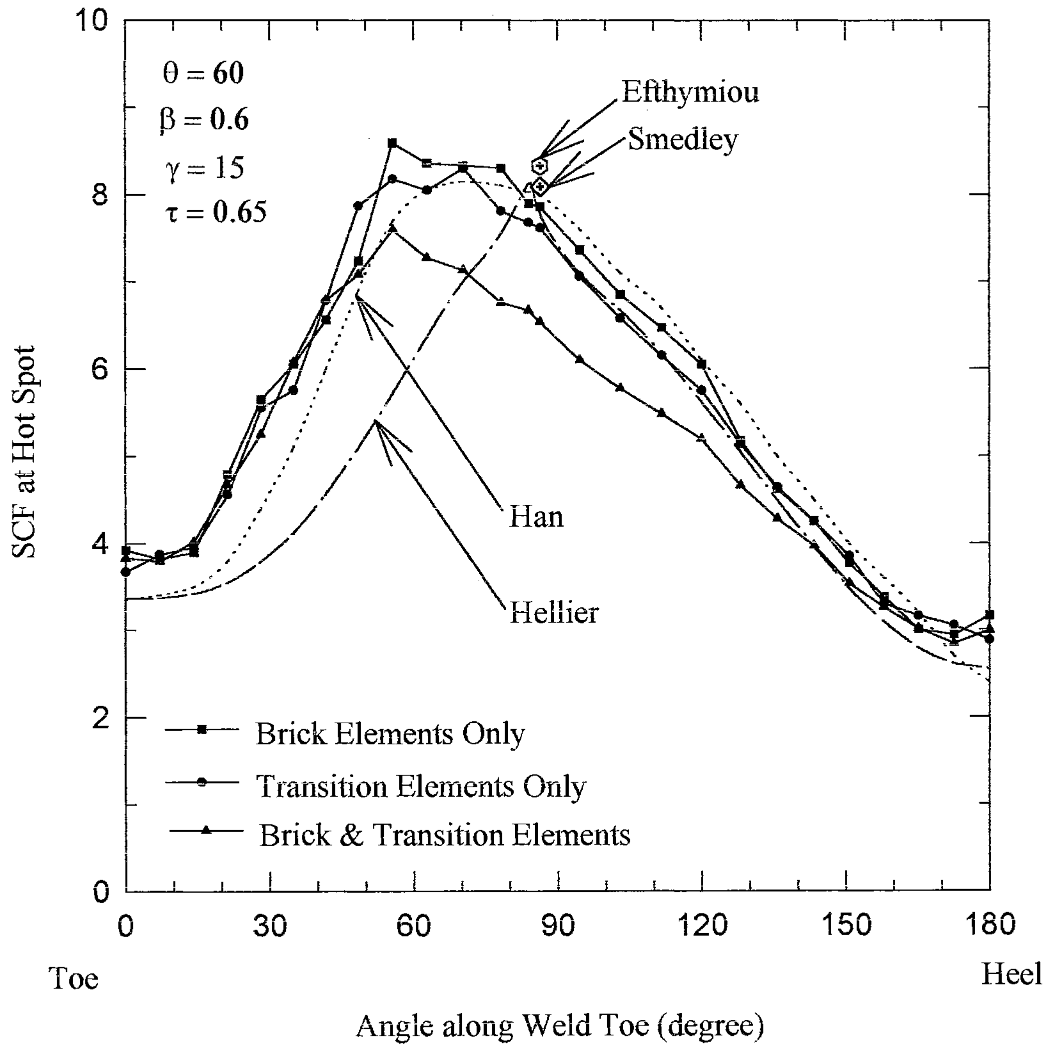


Figure 18. Effect of Element Type on SCF

Comparison with Experimental Results

Dijkstra[9] has conducted full scale tests on tubular joints fabricated from steel. A T-joint from his research is chosen to check the present finite element model. This joint has dimensions, in millimeters, shown in Figure 19.

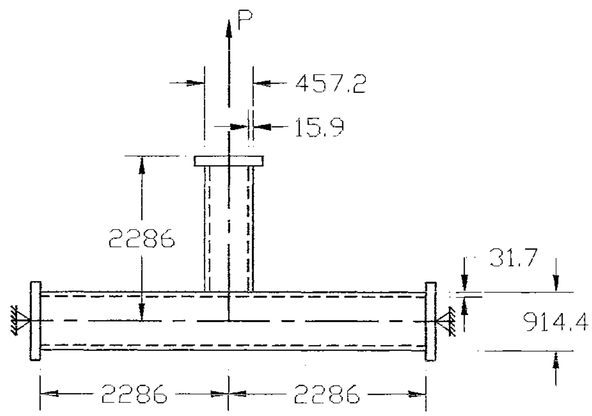


Figure 19. Tubular Joint from Dijkstra

With the above dimensions, the joint parameters have the values shown in Table 2. Strain gages are placed at locations suggested by Marshall[47] to measure the strain at the surface of the chord and brace. The measured strains are then extrapolated to the weld toe to obtained the strain concentration factor.

This joint is modeled using the same finite element mesh as mentioned previously: 8-node shell elements for the tube walls, 20-node solid elements for the weld and with 15-node transition elements between the shell and solid elements. The weld has a profile according to AWS specifications. The finite element results, together with the experimental results, are listed in Table 3. The results calculated from the parametric equations are also listed in the table.

Table 2

Parameters of Joint from Dijkstra

Parameter	Value
θ	90°
α	10.0
β	0.50
γ	14.42
τ	0.50

Table 3

Comparison with Experimental Results

Author	SCF	DoB	ϕ_{hs}
Ho	7.95	0.80	90°
Dijkstra	7.7		
Efthymiou	7.46		
Smedley	8.26		
Hellier	7.90	0.82	88.4°

As shown in Table 3, the stress concentration factor from the present finite element modeling matches very well with Dijkstra's experimental results. Parametric equations from Efthymiou[14] and Hellier[30] also produce results very close to the present model. Parametric equation by Smedley[66] gives a higher value of stress concentration factor for this particular joint. The degree of bending and angle of hot-spot based on finite element analysis match very well with Connolly's[7] parametric equations.

It is concluded that the present finite element model produces reliable results. Therefore the same modeling procedure will be used to analyze other tubular joints.

Finite Element Analysis Results

In the present research, a total of 54 uncracked joints have been analyzed. All these joints are 60° Y-joints with a chord diameter of 1000mm and a chord length of 6000mm. The joints are fixed at both chord ends and subjected to a brace axial tension. As before, the tube walls are modeled with 8-node shell elements, the welds are modeled with 20-node elements, and a row of 15-node transition elements is placed between the shell and solid elements. The weld has a profile according to the AWS specifications.

The finite element analysis results for these joints are shown in Appendix B. The stress concentration factors shown are calculated using the maximum principal stress of the nodes at the surface of the chord at the weld toe divided by the nominal stress of the brace. Degree of bending is the ratio of bending stress to total stress at the hot-spot. The hot-spot is the location where the maximum principal stress occurs, and is measured from the crown toe. It is assumed that the maximum stress occurs at the node. Therefore, the coordinates of the nodes at the weld toe are used to calculate the hot-spot angle without any extrapolation between nodes. The angle between two nodes is about 8 degrees. Therefore the calculated angle has an error of ±4 degrees.

Table B1 in Appendix B shows the results for joints with β=0.4. Stress concentration factors are presented graphically in Figure 20. It is seen that, for β=0.4, the stress concentration factor is directly proportion to the parameter τ. The stress concentration factor also increases with increasing γ, following the same trend as the parametric equations.

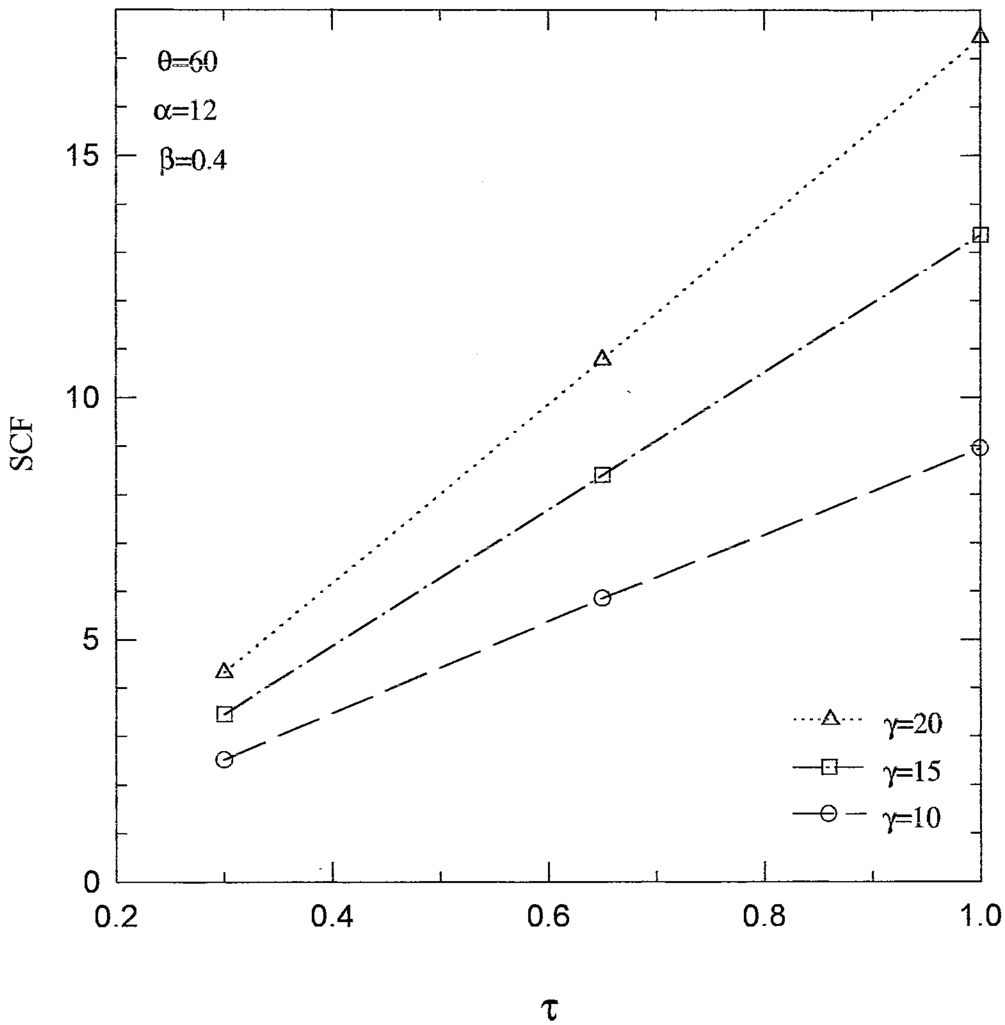


Figure 20. Stress Concentration Factors for β=0.4

For joints with β=0.6, the stress concentration factors are shown in Table B2 and presented graphically in Figure 21. In the same manner as for β=0.4, the stress concentration factors are directly proportion to the parameter τ, and increase with increasing γ.

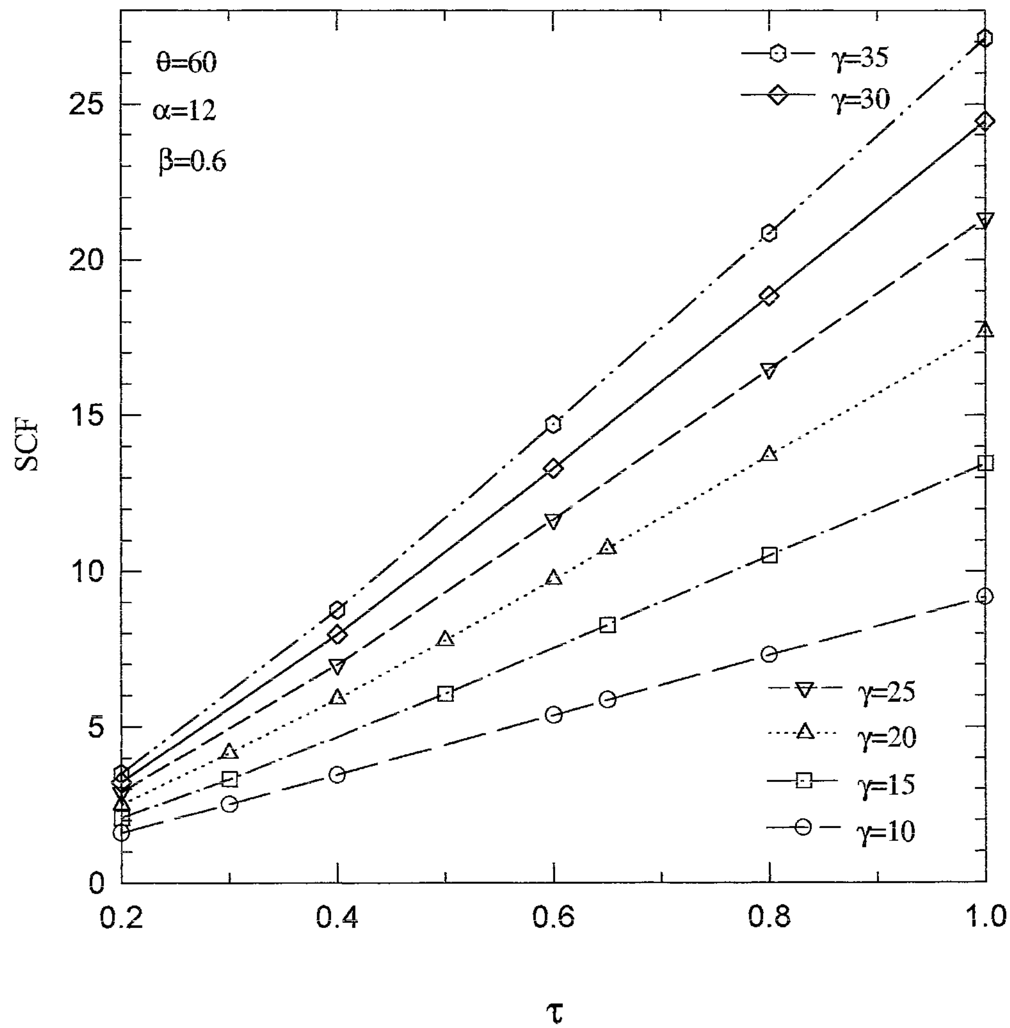


Figure 21. Stress Concentration Factors for β=0.6

The stress concentration for β=0.8 is shown in Table B3 and presented graphically in Figure 22. As before, stress concentration factors are directly proportion to the parameter τ and increase with increasing γ.

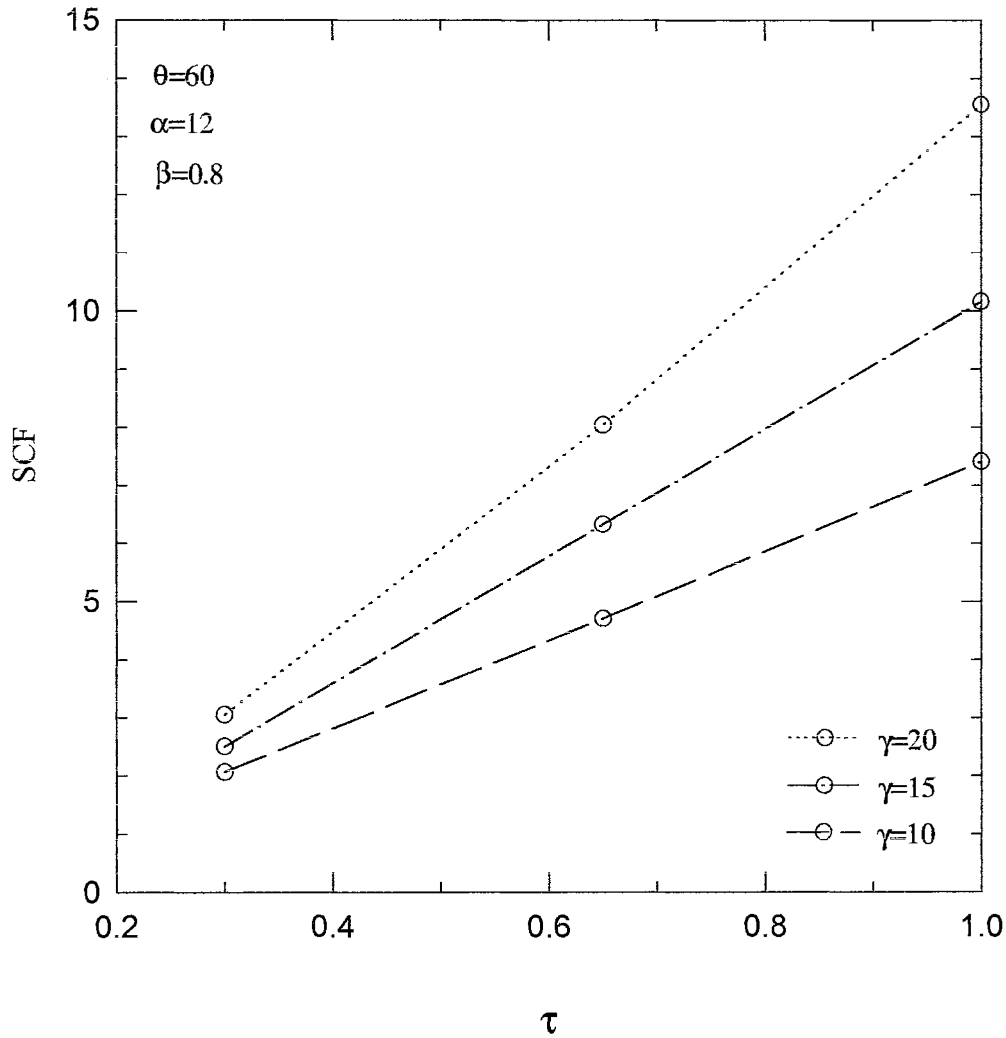


Figure 22. Stress Concentration Factors for β=0.8

As a conclusion, for 60° Y-joints subjected to brace axial tension, the stress concentration factors are directly proportional to the parameter τ. In other words, for joints that vary only in the brace thickness, a thicker brace-wall will produce a larger stress concentration factor. The increase in wall thickness will increase the stiffness of the brace. Hence it will cause more deformation in the chord side which results in a higher stress level.

The stress concentration factor also increases with increasing γ. A larger γ means a thinner chord wall. This has the same effect as decreasing τ. Therefore, either increasing the brace-wall thickness, or reducing the chord-wall thickness will cause the stress concentration factors on the chord side to increase.

CHAPTER IV

COMPARISON OF RESULTS WITH PARAMETRIC EQUATIONS

Comparison of SCF with Parametric Equations

The parametric equations used for comparisons are those proposed by Efthymiou[14], Smedley[66] and Hellier[30]. Smedley's equation is also known as the Lloyd's Register equation. All these equations are listed in Appendix A. As stated in Chapter II, all these equations produce stress concentration factors that are quite close to each other.

It has already been demonstrated in Chapter III that the model used in the present finite element analysis produces results very close to one set of experimental data. The stress concentration factors obtained by finite element analysis are now compared with parametric equations to check their accuracy.

The stress concentration factors calculated according to parametric equations proposed by Efthymiou, Smedley and Hellier are shown in Table 4. Also shown in the table are the stress concentration factors obtained from the present finite element analysis. The stress concentration factors, regardless of which method is used for calculation, agree very well with each other. The comparison is shown in more detail in Figures 23 through 27.

Table 4

Comparison of SCF with Parametric Equations (i)

β	γ	τ	Ho	Efthymiou	Lloyd's	Hellier
0.4	10	0.30	2.52	2.25	2.26	2.37
0.4	10	0.65	5.85	5.28	4.90	6.16
0.4	10	1.00	8.95	8.47	7.53	10.26
0.4	15	0.3	3.46	3.38	3.68	3.27
0.4	15	0.65	8.40	7.91	7.96	8.49
0.4	15	1.00	13.36	12.71	12.25	14.15
0.4	20	0.30	4.32	4.51	5.19	3.96
0.4	20	0.65	10.78	10.55	11.25	10.28
0.4	20	1.00	17.44	16.95	17.30	17.13
0.6	10	0.20	1.61	1.48	1.57	1.33
0.6	10	0.30	2.52	2.30	2.36	2.23
0.6	10	0.40	3.46	3.16	3.15	3.21
0.6	10	0.60	5.38	4.94	4.72	5.34
0.6	10	0.65	5.86	5.40	5.12	5.90
0.6	10	0.80	7.30	6.78	6.30	7.62
0.6	10	1.00	9.17	8.67	7.87	9.99
0.6	15	0.20	2.08	2.21	2.56	1.83
0.6	15	0.30	3.32	3.46	3.84	3.08
0.6	15	0.50	6.06	6.06	6.40	5.87
0.6	15	0.65	8.27	8.09	8.33	8.13
0.6	15	0.80	10.51	10.17	10.25	10.50
0.6	15	1.00	13.45	13.00	12.81	13.77
0.6	20	0.20	2.51	2.95	3.62	2.22
0.6	20	0.30	4.16	4.61	5.43	3.73
0.6	20	0.40	5.89	6.33	7.24	5.36
0.6	20	0.50	7.78	8.09	9.04	7.10
0.6	20	0.60	9.74	9.88	10.85	8.92
0.6	20	0.65	10.73	10.79	11.76	9.85
0.6	20	0.80	13.71	13.56	14.47	12.72
0.6	20	1.00	17.68	17.33	18.09	16.68
0.6	25	0.20	2.91	3.69	4.73	2.53
0.6	25	0.40	7.00	7.91	9.46	6.11
0.6	25	0.60	11.67	12.35	14.19	10.16
0.6	25	0.80	16.48	16.95	18.91	14.49
0.6	25	1.00	21.33	21.66	23.64	19.00

Table 4

Comparison of SCF with Parametric Equations (ii)

β	γ	τ	Ho	Efthymiou	Lloyd's	Hellier
0.6	30	0.20	3.23	4.43	5.89	2.79
0.6	30	0.40	7.96	9.49	11.77	6.35
0.6	30	0.60	13.31	14.82	17.66	10.91
0.6	30	0.80	18.84	20.34	23.54	15.96
0.6	30	1.00	24.45	26.00	29.43	20.93
0.6	35	0.20	3.50	NA	7.08	NA
0.6	35	0.40	8.75	NA	14.16	NA
0.6	35	0.60	14.71	NA	21.24	NA
0.6	35	0.80	20.86	NA	28.32	NA
0.6	35	1.00	27.11	NA	35.40	NA
0.8	10	0.30	2.07	1.85	1.78	1.63
0.8	10	0.65	4.71	4.33	3.86	4.35
0.8	10	1.00	7.41	6.95	5.93	7.42
0.8	15	0.30	2.51	2.77	2.90	2.25
0.8	15	0.65	6.33	6.49	6.27	5.99
0.8	15	1.00	10.16	10.42	9.65	10.23
0.8	20	0.30	3.06	3.70	4.09	2.72
0.8	20	0.65	8.04	8.65	8.86	7.25
0.8	20	1.00	13.55	13.90	13.63	12.38

Figure 23 shows a comparison of stress concentration factors for joints with a ratio of brace to chord diameter, β, of 0.4. The figure shows joints with γ ranging from 10 to 20. The stress concentration factors from finite element analysis are very close to the parametric equations proposed by Efthymiou, Lloyd's Register and Hellier.

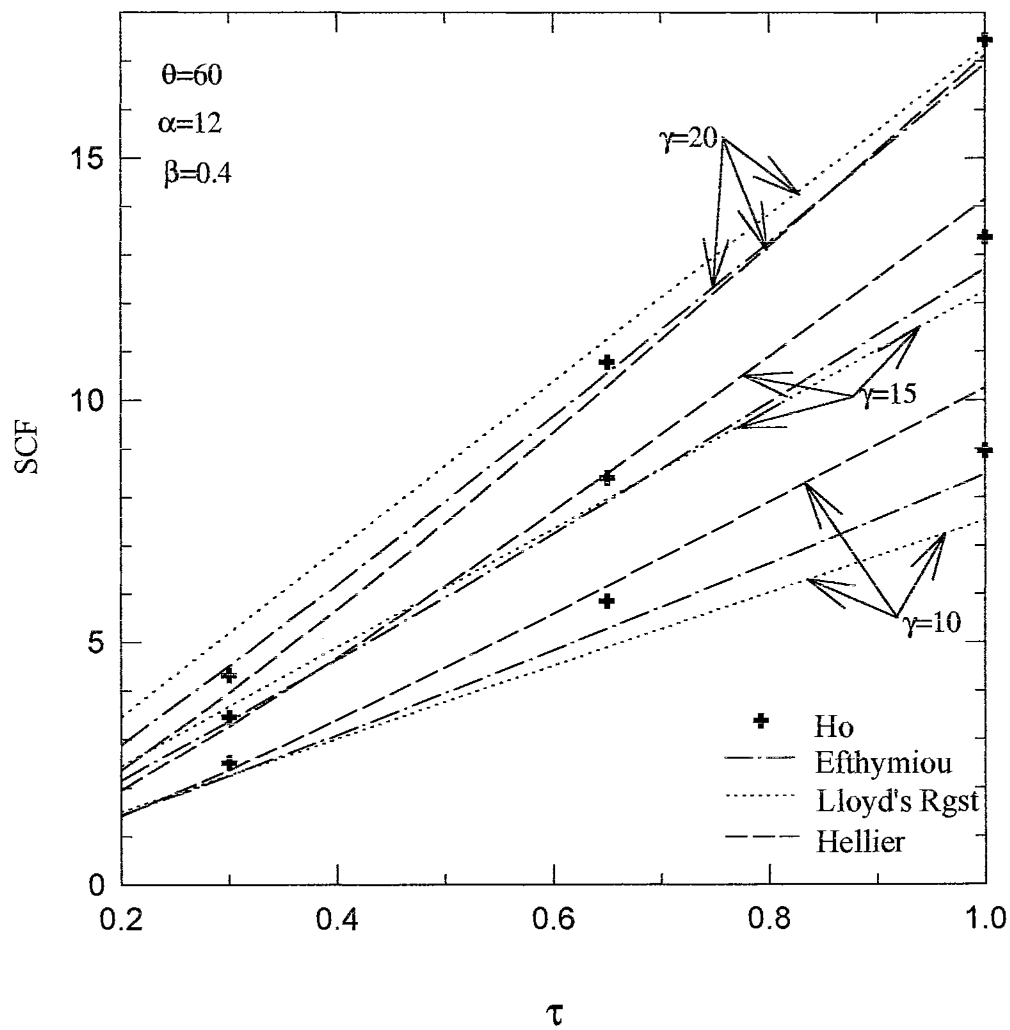


Figure 23. Comparison of SCF for β=0.4

For β=0.6, since more joints are analyzed, the comparisons are shown in the following three figures. Figure 24 shows joints with γ=10. The stress concentration factors calculated from the three parametric equations have almost the same values as those obtained from finite element analysis.

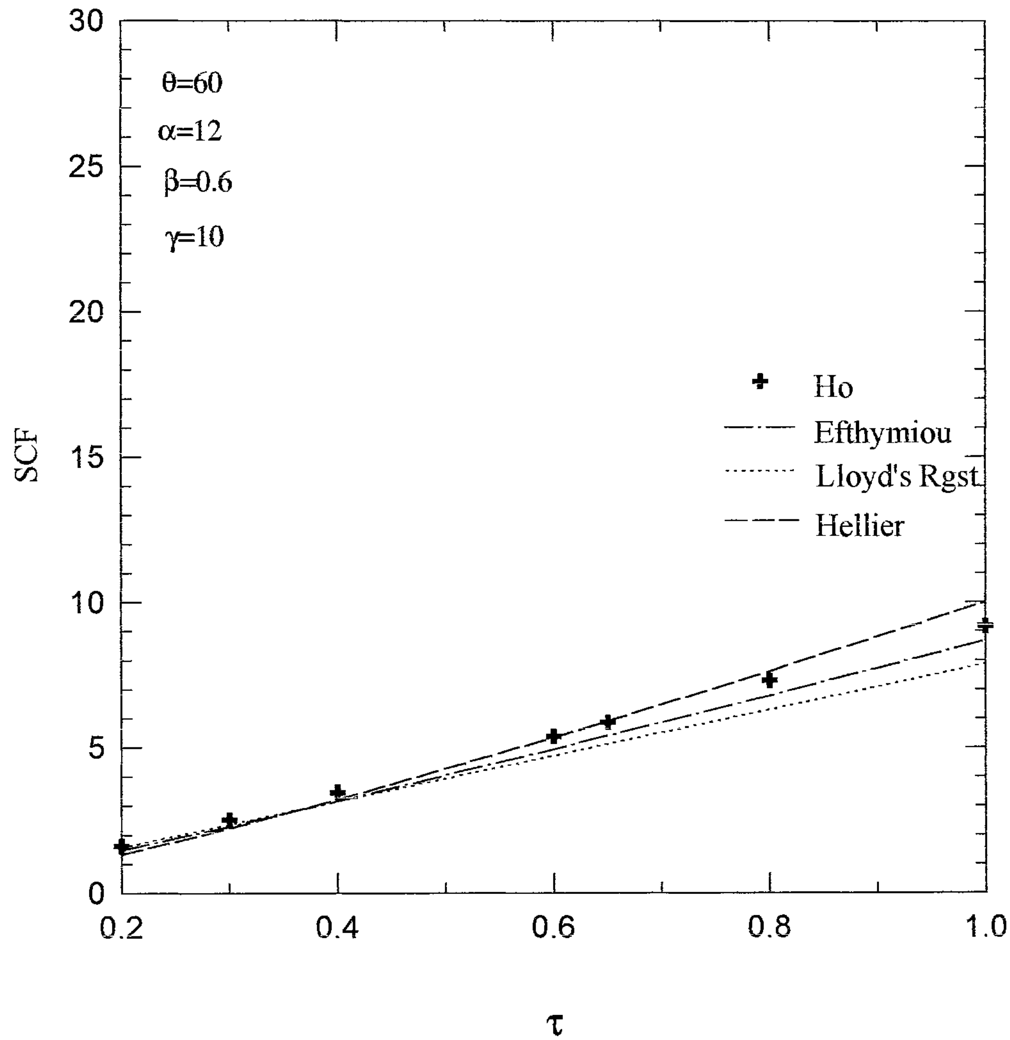


Figure 24. Comparison of SCF for β=0.6 and γ=10

When γ=20, Efthymiou's equation gives stress concentration factors closest to the finite element results as shown in Figure 25. However, the differences between the other two equations are extremely small. For this case, the stress concentration factors from finite element analysis match very well with the parametric equations.

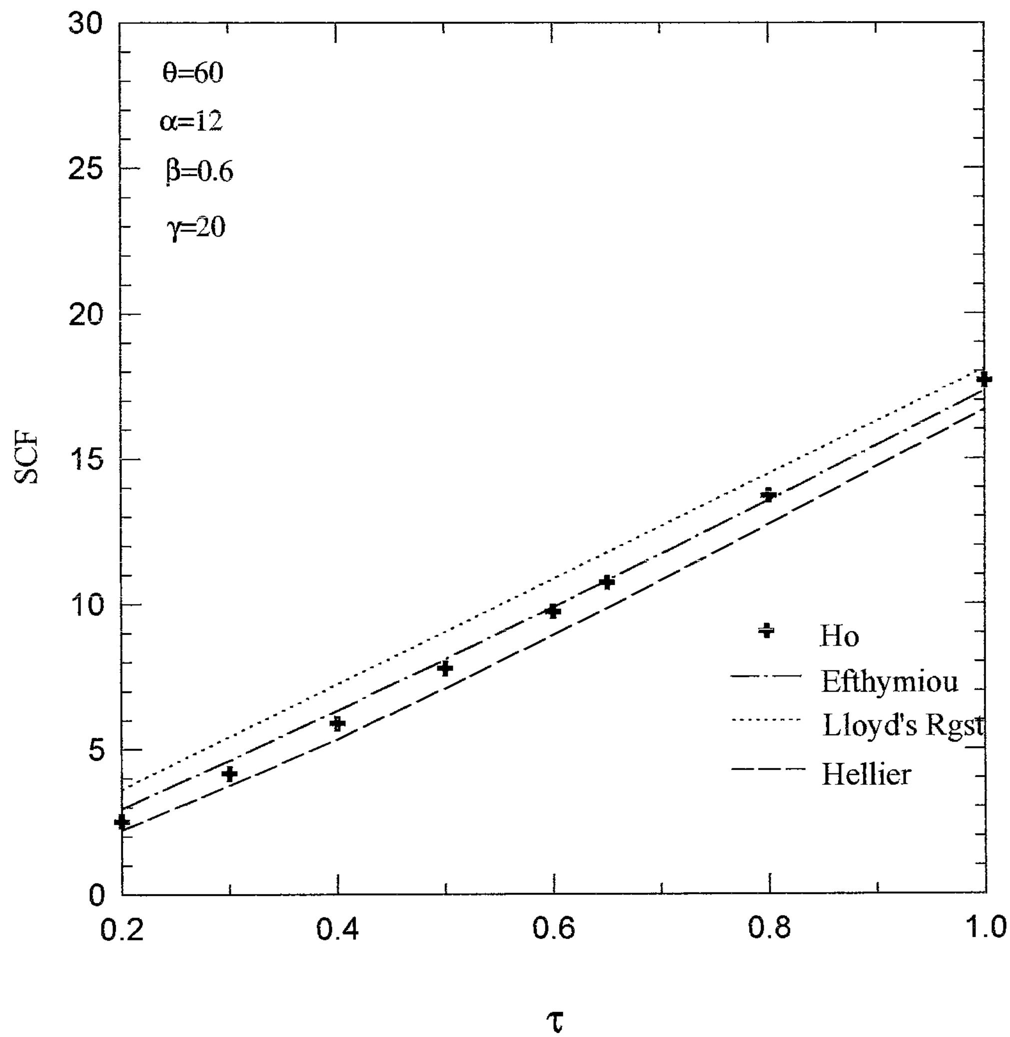


Figure 25. Comparison of SCF for β=0.6 and γ=20

As γ increases, Hellier and Lloyd's equations produce larger differences, with Hellier's equation on the lower side. Figure 26 shows the case where γ is 30. Efthymiou's equation gives the best matching results. Though the difference between both Hellier and Lloyd's Register is larger, neither is far away from the finite element analysis, ranging from 15% to 20%.

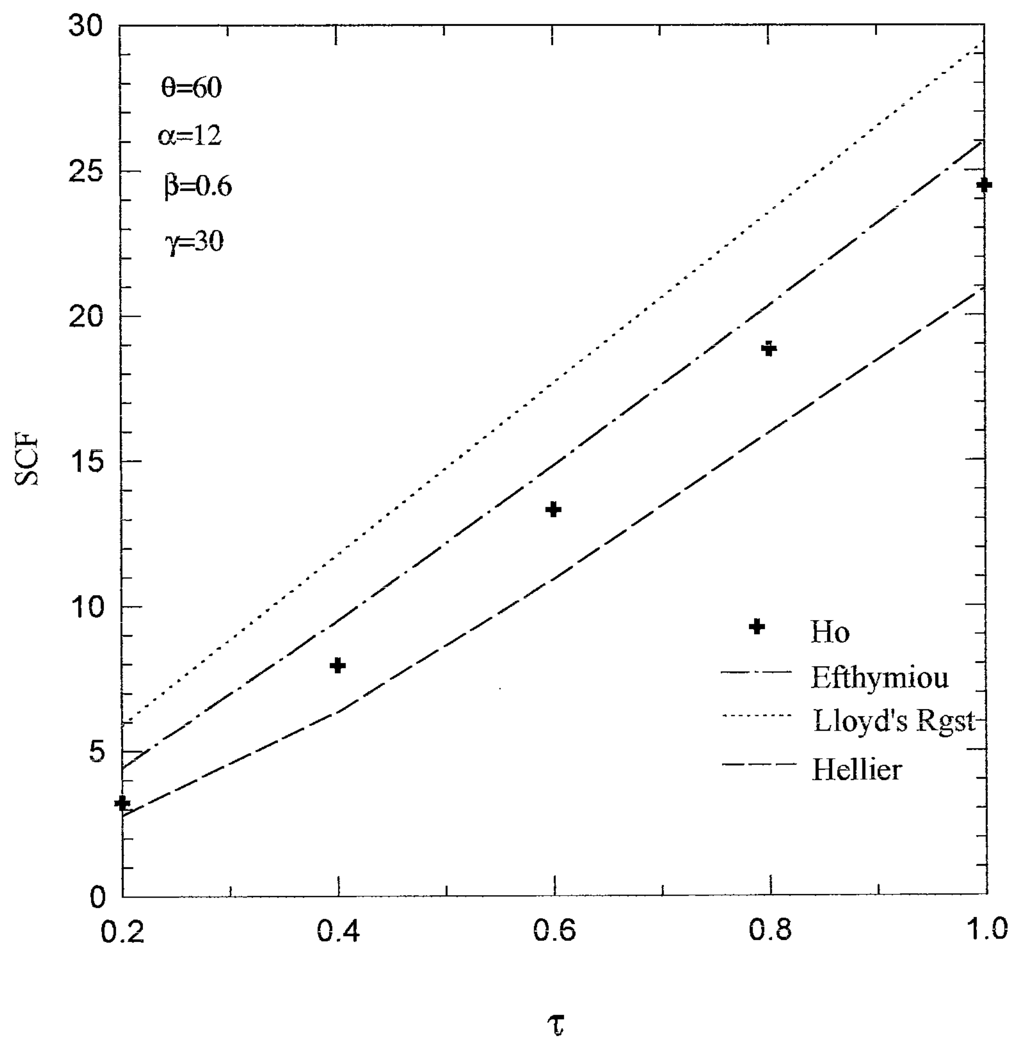


Figure 26. Comparison of SCF for β=0.6 and γ=30

For β=0.6, Efthymiou's equation produces results closest to the finite element analysis results, but equations proposed by Hellier and Lloyd's Register also closely match the finite element results.

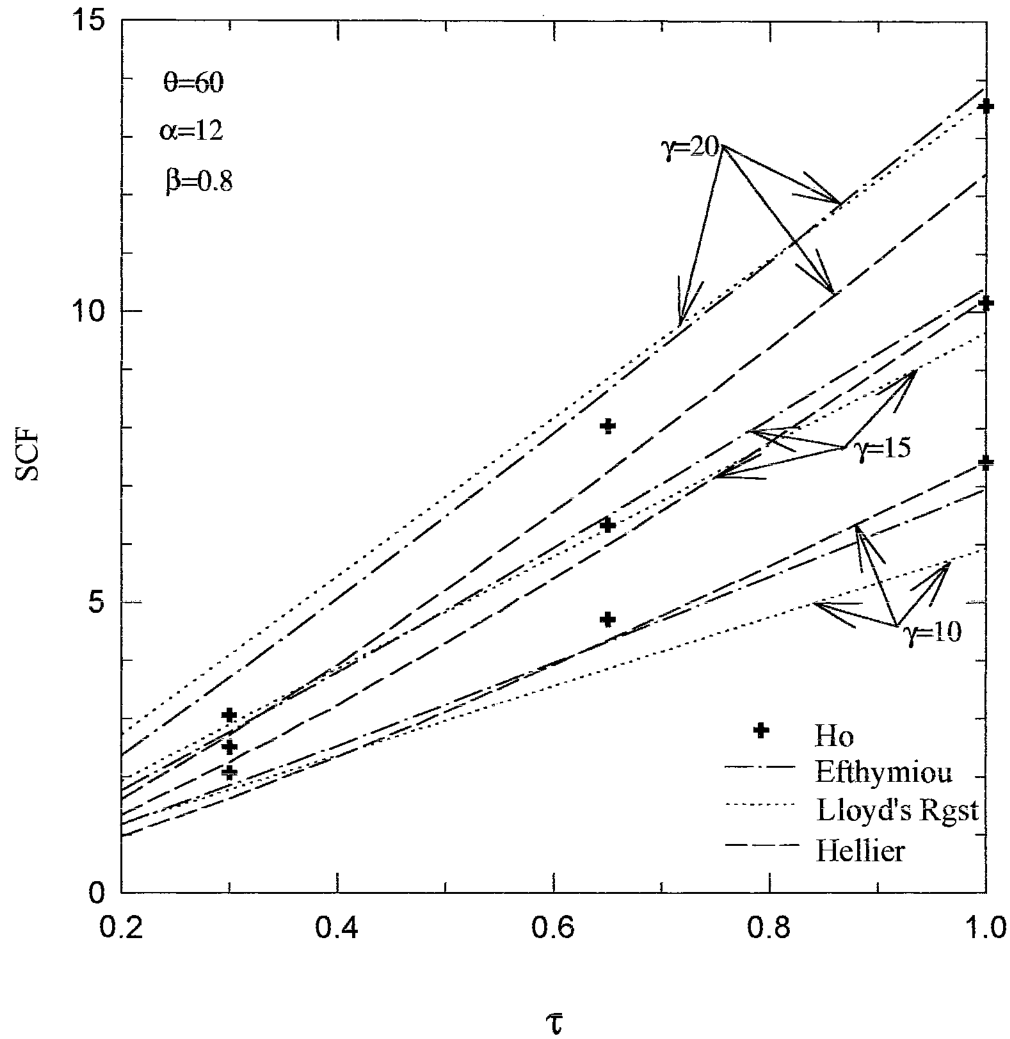


Figure 27. Comparison of SCF for β=0.8

For joints with β=0.8, the stress concentration factors from finite analysis again match very well with the parametric equations, as shown in Figure 27. The figure shows joints with γ ranging from 10 to 20. No matter what γ range, all of the parametric equations produce stress concentration factors that are very agreeable with the finite element results.

As a whole, for joints with β from 0.4 to 0.8, parametric equations proposed by Efthymiou, Lloyd's Register and Hellier produce stress concentration factors very close to the present finite element results. However, Efthymiou's equation produces stress concentration factors in closest agreement with the finite element results.

Comparison of DoB with Parametric Equations

Researchers in University College London proposed parametric equations to calculate degree of bending and hot-spot location for tubular joints. The parametric equation to calculate degree of bending proposed by Connolly[7] is compared with the values obtained from finite element analysis. The values of degree of bending are shown in Table 5. It is found that the degree of bending calculated according to the parametric equation is very close to the finite element analysis results. It should be noted that the difference between the maximum and minimum degree of bending is small. For all the joints analyzed, the degree of bending only ranges from 0.727 to 0.869. Therefore, the degree of bending is not very sensitive to joint parameters for Y-joints subjected to brace tension.

Table 5

Comparison of DoB and Hot Spot Angle (i)

β	γ	τ	Ho's DoB	Connolly's DoB	Ho's ϕ_{hs}	Hellier's ϕ_{hs}
0.4	10	0.30	0.791	0.813	66.1	55.7
0.4	10	0.65	0.809	0.839	66.1	73.5
0.4	10	1.00	0.818	0.863	66.1	83.1
0.4	15	0.3	0.818	0.822	66.1	59.8
0.4	15	0.65	0.836	0.849	82.4	77.0
0.4	15	1.00	0.849	0.873	82.4	86.3
0.4	20	0.30	0.832	0.829	66.1	61.8
0.4	20	0.65	0.848	0.856	82.5	78.7
0.4	20	1.00	0.860	0.880	82.4	87.9
0.6	10	0.20	0.765	0.771	53.9	50.8
0.6	10	0.30	0.773	0.782	53.9	57.1
0.6	10	0.40	0.780	0.792	53.9	62.5
0.6	10	0.60	0.790	0.812	53.9	71.0
0.6	10	0.65	0.792	0.817	53.9	72.7
0.6	10	0.80	0.797	0.831	53.9	77.2
0.6	10	1.00	0.802	0.850	53.9	81.9
0.6	15	0.20	0.793	0.792	53.9	55.1
0.6	15	0.30	0.804	0.804	61.5	61.1
0.6	15	0.50	0.817	0.825	61.5	70.9
0.6	15	0.65	0.836	0.840	77.3	76.2
0.6	15	0.80	0.841	0.855	77.3	80.6
0.6	15	1.00	0.846	0.874	77.3	85.2
0.6	20	0.20	0.812	0.808	61.5	57.2
0.6	20	0.30	0.824	0.820	61.5	63.1
0.6	20	0.40	0.831	0.831	61.5	68.3
0.6	20	0.50	0.844	0.842	77.3	72.7
0.6	20	0.60	0.847	0.852	77.3	76.4
0.6	20	0.65	0.848	0.857	77.3	78.0
0.6	20	0.80	0.853	0.872	77.3	82.2
0.6	20	1.00	0.858	0.892	77.3	86.7

Table 5

Comparison of DoB and Hot Spot Angle (ii)

β	γ	τ	Ho's DoB	Connolly's DoB	Ho's ϕ_{hs}	Hellier's ϕ_{hs}
0.6	25	0.20	0.821	0.821	61.5	58.4
0.6	25	0.40	0.847	0.844	77.3	69.4
0.6	25	0.60	0.853	0.865	77.3	77.4
0.6	25	0.80	0.859	0.885	77.3	83.2
0.6	25	1.00	0.864	0.905	77.3	87.7
0.6	30	0.20	0.825	0.831	61.5	59.2
0.6	30	0.40	0.849	0.855	77.3	70.2
0.6	30	0.60	0.855	0.876	77.3	78.1
0.6	30	0.80	0.862	0.897	77.3	83.8
0.6	30	1.00	0.867	0.917	77.3	88.3
0.6	35	0.20	0.826	NA	61.5	NA
0.6	35	0.40	0.850	NA	77.3	NA
0.6	35	0.60	0.856	NA	77.3	NA
0.6	35	0.80	0.863	NA	77.3	NA
0.6	35	1.00	0.869	NA	77.3	NA
0.8	10	0.30	0.727	0.719	41.3	59.2
0.8	10	0.65	0.747	0.759	41.3	72.6
0.8	10	1.00	0.761	0.799	44.6	81.3
0.8	15	0.30	0.770	0.757	54.1	63.2
0.8	15	0.65	0.800	0.800	54.1	76.2
0.8	15	1.00	0.811	0.843	54.1	84.6
0.8	20	0.30	0.792	0.786	58.3	65.1
0.8	20	0.65	0.825	0.831	73.4	77.9
0.8	20	1.00	0.834	0.875	73.4	86.2

Location of the hot-spot is also compared with Hellier's parametric equation. The hot-spot angle in this research is calculated directly from the coordinates of the nodes.

The hot-spot is assumed located at the nodes. No extrapolation is taken between the nodes. The angle between two nodes is about 8 degrees. Therefore the calculated angle has an error of ±4 degrees. As a result, the hot-spot angle calculated may be quite different from that of the parametric equation. However, as shown later in this research, the stress intensity factors are not very sensitive to the location of the hot-spot.

Figures 28 through 30 show the comparison of the degree of bending calculated from finite element analysis to that calculated from the parametric equation proposed by Connolly. Figure 28 is drawn for the case of $\beta = 0.4$, while Figure 29 is for $\beta = 0.6$ and Figure 30 is for $\beta = 0.8$. All three figures show that degree of bending calculated by finite element analysis is close to the parametric equation when τ is low. When the value of τ is high, the difference between the finite element values and parametric equation increases with the parametric equation always on the higher side. Connolly uses shell elements to model the whole joint, while in the present analysis the weld is modeled with solid elements. With the brick elements used in the present analysis, stresses at the outer and inner chord wall surface can be obtained. The stress variation through the wall thickness is assumed linear when calculating the bending stress component.

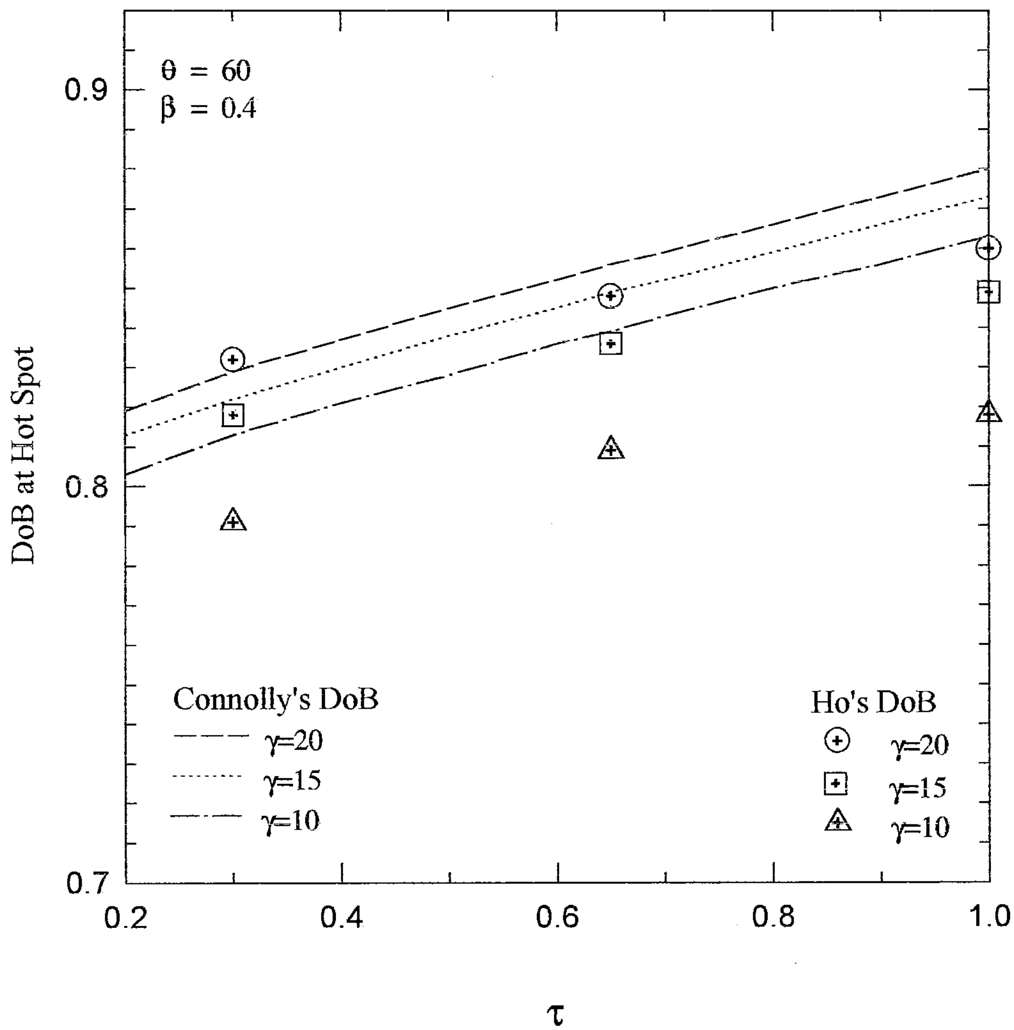


Figure 28. Comparison of DoB with Parametric Equation for β=0.4

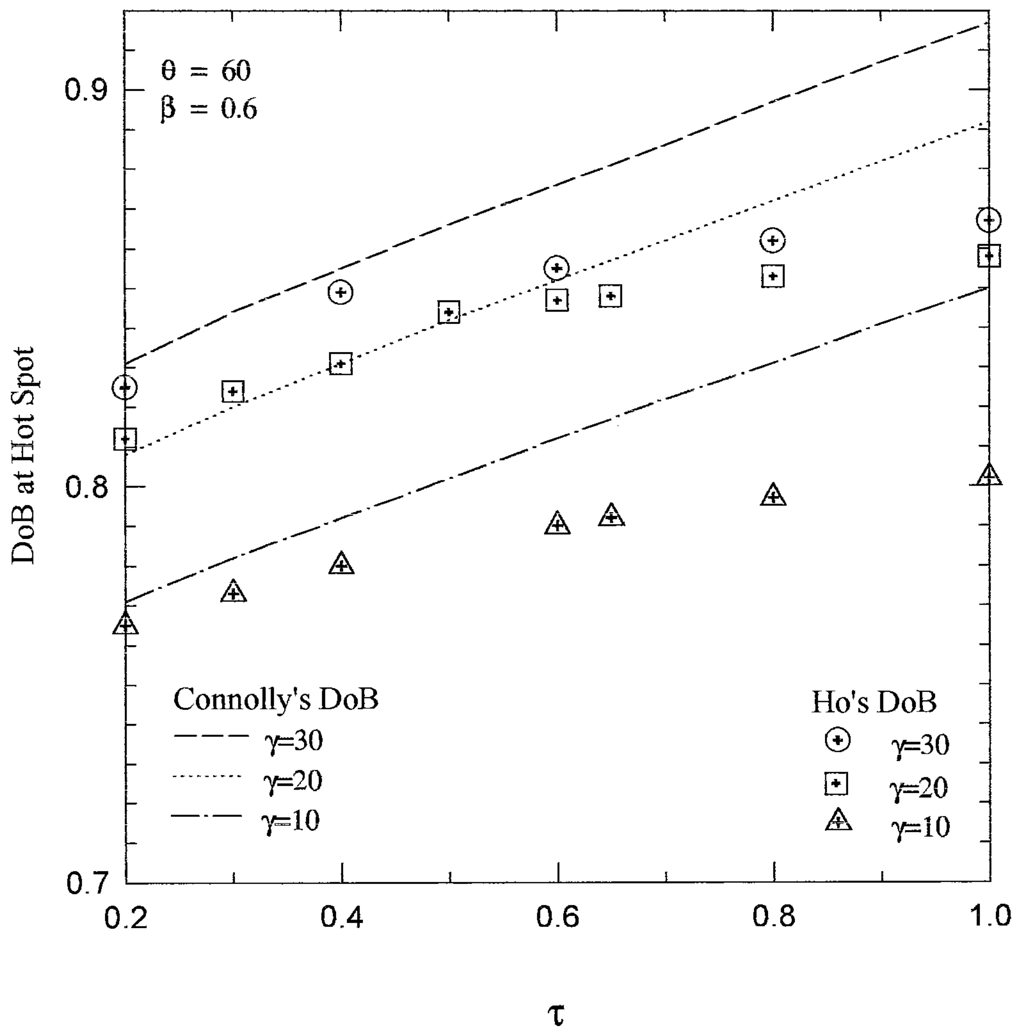


Figure 29. Comparison of DoB with Parametric Equation for β=0.6

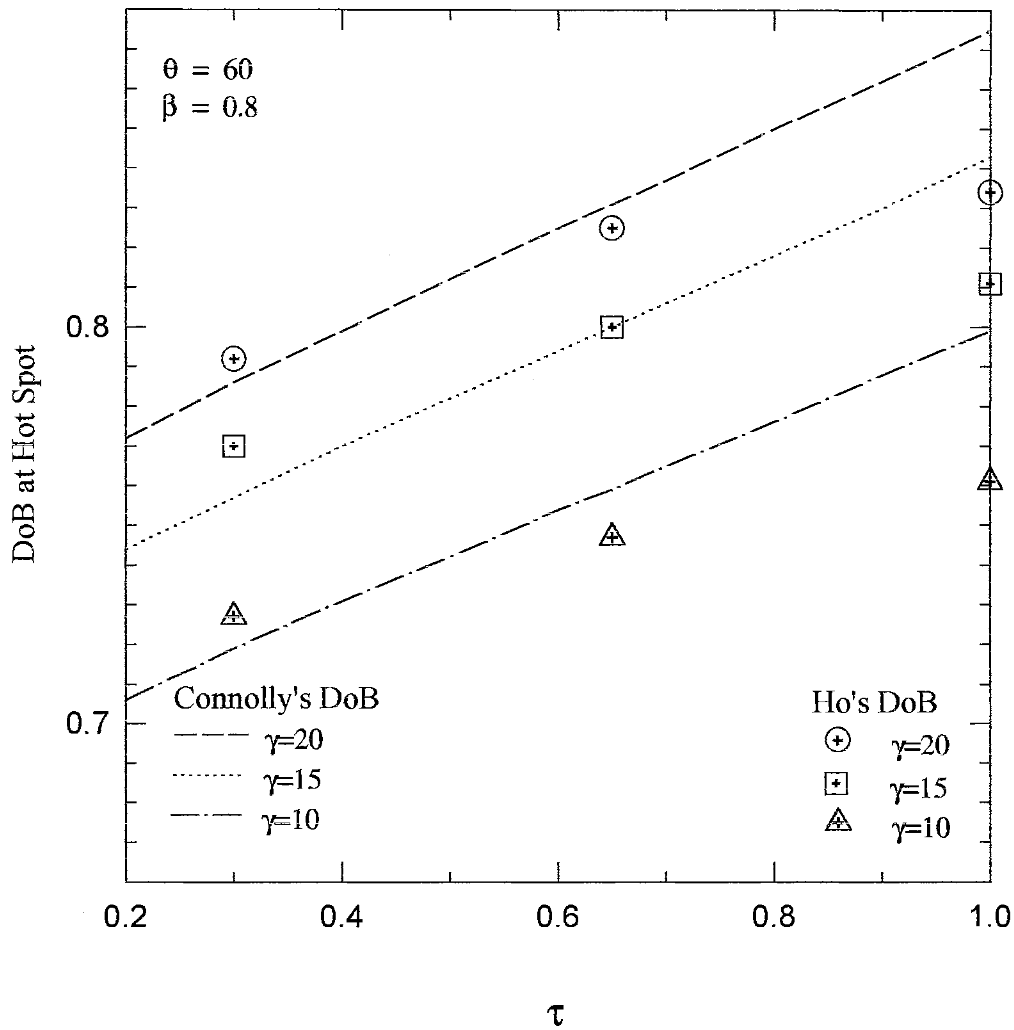


Figure 30. Comparison of DoB with Parametric Equation for β=0.8

Concluding Remarks

The joints analyzed in this research cover the most practical range of 60° Y-joints used in industry. The parametric equations proposed by Efthymiou, Smedley and Hellier all produce stress concentration factors that are in good agreement with the finite element results. By inspecting the form of equation in Appendix A, Efthymiou's equation is very simple, but it produces the most agreeable results over the range of parameters studied.

Over the range of parameters studied, the degree of bending varies only from 0.727 to 0.869 based on finite element analysis. The parametric equation proposed by Connolly gives degree of bending in acceptable agreement with the finite element results.

CHAPTER V

ANALYSIS OF CRACKED JOINTS BY 3D FINITE ELEMENT METHOD

Finite Element Modeling

The cracked tubular joint is modeled in a way similar to an uncracked joint. The tube-walls are modeled with 8-node shell elements, the weld with 20-node solid elements, with a row of 15-node transition elements between the shell and solid elements. The weld has a profile according to AWS specifications.

Modeling of Crack

The crack is placed on the outer surface of the chord along the weld toe, with the crack surface perpendicular to the chord surface. The crack shape is semi-elliptical, with length of "2c" and depth "a". The crack is modeled with one layer of elements over and one layer under the crack surface. At the crack tip, six 20-node collapsed hexagonal elements are used.

Development of a crack mesh is begun by dividing the chord wall into suitable patches with one long and narrow patch adjacent to the weld toe where the crack will be placed. A super-element is modeled in this patch which contains only two rows of 20-node solid elements. The crack will be situated along the line that divides the patch into two rows of solid elements. One row of solid elements is then moved under the weld. As a result, the crack opening line will lie along the weld toe. The crack opening line is defined by specifying the two crack tip coordinates. This can be achieved either by showing the patch on the screen and then pointing to two points on the patch, or by typing in the coordinates of the two crack tips. The crack front is defined by specifying a half elliptical crack shape and the maximum depth of the crack. The mesh will be created automatically by PRETUBE after all parameters are defined.

A person who already knows how to generate the mesh for an uncracked joint can learn in two 40-hour weeks how to generate the mesh for a cracked joint. At first, it takes two days to create a joint with a crack. With experience, the time reduces to a half day.

There are some common difficulties that a first-time user may encounter when generating a crack mesh. The chord wall must be divided into several patches in order to make a long and narrow patch near the weld toe where the crack will be placed. This is best done on the screen with the developed view of the chord wall. However, the positions are only judged by comparing the relative shapes on the screen. The long patch where the crack will be located may not be in the right position or may not be long enough for the crack. If this occurs, the chord wall must be divided again.

After the chord wall is divided into patches, the number of nodes on the boundary of each patch must be specified. The mesh of the patch will be generated according to the nodes on the boundary. The program may not be able to divide the patch into small elements when the number of boundary nodes are not in the right proportion. If the right proportion is not achieved, the number of boundary nodes must be adjusted until a suitable mesh is generated.

Due to the complex profile of the weld, it is impossible to calculate the coordinates of the two crack tips. The crack is usually defined by making two points on the screen, but that will not give the exact length of crack desired. The easiest way to obtain the correct crack length is to print out the coordinates of the nodes on the crack front. The coordinates are adjusted to obtain the correct length and position. This procedure may require several runs to get the desired crack length.

Computing Procedure

The mesh of the joint with the crack is generated by PRETUBE. The joint is analyzed with SESTRA. POSTSIF is used to extract data for nodes on the crack front. POSTSIF will also calculate stress intensity factors from these data. The length and position of the crack is calculated from coordinates of the crack front. Due to the profile of the weld, the curved length of the crack is very difficult to calculate. Therefore length of the crack is taken as the straight line distance between the two crack tips. In this way, a 200mm long crack has an error of only 4mm.

The length of the crack may not be the expected one. Then another run has to be carried out by refining the crack tip coordinates. The length of crack should converge to the expected length after two to four runs.

Re-Analysis of Joints in Previous Research

Joint Geometry and Crack Size

Several Y-joints with different crack sizes subjected to brace axial tension have been analyzed by Han[23] using the 3D finite element method. These joints are analyzed again to check the present finite element model and software. All joints are 60^{o} Y-joints with a chord diameter of 1000mm and a chord length of 6000mm, fixed at both chord ends. The brace has a length of 3000mm and a diameter varying from 600mm to 800mm. The parameters of each joint are shown in Table 6.

The crack tip coordinates used for these joints has been reported by Han. This information is reproduced in Appendix C for reference. The same crack tip coordinates will be used to generate the crack. With the given coordinates, the cracks are situated at the saddle (86.3^{o} from the crown toe). For joints S1 to S6 and L1 to L6, the joints are of the same geometry but different crack size. For joints YS10 to YS27, the crack size is kept constant but the joint geometry varies. Cracks are modeled as discussed previously. Stress intensity factors are calculated using POSTSIF.

Analysis Results

Table 6 shows the results of the present analysis together with Han's results. The stress intensity factor of each joint is represented by the non-dimensional stress correction factor, Y, which is defined as:

$$Y_{ia} = \frac{K_{ia}}{\sigma_n \sqrt{\pi a}}$$

where K = stress intensity factor

σ_n = nominal stress in brace, and

i = 1, 2, 3 which refers to the mode of fracture.

The subscript "c" on Y would represent the stress intensity factor located at the surface of the crack, and "a" represents that at the deepest point. Y_{ea} is the effective stress correction factor at the deepest point of the crack. Based on the energy release rate concept, Y_{ea} is defined as:

$$Y_{ea} = \sqrt{Y_{1a}^2 + Y_{2a}^2 + \frac{Y_{3a}^2}{(1-\nu)}}$$

where ν = Poisson's ratio, taken as 0.3.

As seen from Table 6, the stress intensity factors for the first mode, Y_{1a}, are very agreeable with Han's results except for joint S4 which has a very shallow and long crack. The sign of the stress intensity factors of second mode is opposite to that of Han. This is simply due to different orientation of the coordinates taken to generate the mesh of the joint. The stress intensity factors of the second and third mode are very low. On the whole, the present finite element model produces results in agreement with Han.

In the present analysis, the postprocessor used to calculated the stress intensity factors is called POSTSIF, which is supplied as a module by SESEAM. POSTSIF calculates the stress intensity factors using the displacements of the nodes on the crack front. Han used the postprocessor called KAARL which was developed at Conoco. That is part of the reason why some results are different between the two analyses.

Table 6

Analysis Results for Joints from Previous Research

Joint	β	γ	τ	a/T	a/c	Ho's Y_{1a}	Han's Y_{1a}	Ho's Y_{2a}	Han's Y_{2a}	Ho's Y_{3a}	Han's Y_{3a}	Ho's Y_{ea}	Han's Y_{ea}
S4	0.6	15	0.65	0.05	0.10	10.65	7.31	-3.41	2.27	-0.74	-0.28	11.21	7.66
S1	0.6	15	0.65	0.05	0.30	8.56	7.10	-3.41	1.94	-0.33	-0.28	9.22	7.37
S5	0.6	15	0.65	0.12	0.10	8.14	7.56	-1.72	1.14	-0.45	-0.27	8.34	7.66
S2	0.6	15	0.65	0.12	0.30	6.91	6.66	-1.75	1.00	-0.21	0.27	7.14	6.75
S6	0.6	15	0.65	0.20	0.10	7.14	7.24	-1.14	0.99	-0.36	0.36	7.25	7.32
L4	0.6	15	0.65	0.20	0.20	6.39	6.23	-1.06	0.71	-0.32	0.28	6.49	6.28
S3	0.6	15	0.65	0.20	0.30	5.85	5.96	-1.07	0.81	-0.20	0.22	5.95	6.02
L1	0.6	15	0.65	0.20	0.40	5.40	5.50	-1.05	0.77	-0.13	0.22	5.50	5.56
L5	0.6	15	0.65	0.50	0.20	4.40	4.74	-0.48	0.51	-0.29	-0.17	4.44	4.78
L2	0.6	15	0.65	0.50	0.40	3.05	3.34	-0.34	0.39	-0.21	-0.23	3.08	3.37
L6	0.6	15	0.65	0.80	0.20	2.60	3.07	-0.55	0.53	-0.28	-0.18	2.68	3.12
L3	0.6	15	0.65	0.80	0.40	1.10	1.36	-0.44	0.34	-0.20	0.25	1.21	1.44
YS12	0.6	10	0.30	0.13	0.20	1.85	1.59	-0.29	0.40	-0.18	-0.16	1.88	1.65
YS17	0.6	10	0.65	0.13	0.20	4.63	4.25	-1.01	0.96	-0.28	-0.25	4.75	4.37
YS18	0.6	10	1.00	0.13	0.20	7.25	6.54	-1.61	1.40	-0.39	-0.31	7.44	6.70
YS10	0.6	15	0.30	0.20	0.20	2.53	2.32	-0.26	0.39	-0.19	-0.16	2.56	2.36
YS15	0.6	15	0.65	0.20	0.20	6.39	6.14	-1.06	0.86	-0.32	-0.25	6.49	6.21
YS14	0.6	15	1.00	0.20	0.20	10.12	9.94	-1.63	1.37	-0.46	-0.44	10.26	10.04
YS13	0.6	20	0.30	0.27	0.20	2.91	2.89	-0.24	0.35	-0.20	-0.15	2.93	2.92
YS11	0.6	20	0.65	0.27	0.20	7.36	7.61	-1.08	0.64	-0.26	-0.25	7.44	7.64
YS16	0.6	20	1.00	0.27	0.20	11.68	12.27	-1.63	1.21	-0.36	-0.39	11.80	12.34
YS24	0.8	10	0.30	0.13	0.20	1.19	1.16	-0.16	0.28	-0.17	-0.11	1.22	1.20
YS23	0.8	10	0.65	0.13	0.20	3.30	3.15	-0.58	0.56	-0.33	-0.22	3.37	3.21
YS21	0.8	10	1.00	0.13	0.20	5.39	5.08	-0.95	0.99	-0.57	-0.39	5.51	5.20
YS25	0.8	15	0.30	0.20	0.20	1.64	1.68	-0.13	0.24	-0.21	-0.10	1.67	1.70
YS19	0.8	15	0.65	0.20	0.20	4.92	4.88	-0.63	0.67	-0.43	-0.23	4.99	4.94
YS22	0.8	15	1.00	0.20	0.20	8.17	8.16	-1.03	1.12	-0.71	-0.42	8.28	8.25
YS20	0.8	20	0.30	0.27	0.20	1.92	2.08	-0.12	0.23	-0.20	-0.11	1.94	2.09
YS27	0.8	20	0.65	0.27	0.20	5.97	6.42	-0.55	0.61	-0.44	-0.23	6.02	6.45
YS26	0.8	20	1.00	0.27	0.20	10.02	10.56	-0.91	1.13	-0.70	-0.43	10.10	10.64

Comparison with Other Analysis Methods

Kim[37] and Hsu[34] have also analyzed these joints using their own approximate methods. Hsu assumes that the stress at the crack front can be separated into bending and membrane stresses. The stress intensity factor for each stress can be obtain by modifying with two factors the solution of a flat plate under the same stress. One factor is a correction factor which accounts for the notch effect at the weld toe. The other factor accounts for the variation of stress along the weld toe. The final stress intensity factor is obtained by combining the factors due to bending and membrane stresses.

Kim analyzed these joints using TJLIFE, a software used by Shell in designing fixed offshore structures. This software is based on a fracture mechanics model for fatigue life analysis.

Their results, together with Han's, are listed in Table 7 for comparison. The stress intensity factors are listed in the form of effective stress correction factors at the deepest point, Y_{ea}. The comparison is also shown graphically in Figures 31 and 32.

Table 7

Comparison of Y_{ea} with Other Analysis Methods

Joint	β	γ	τ	a/T	a/c	Ho	Han	Kim	Hsu
S4	0.6	15	0.65	0.05	0.10	11.21	7.66	10.73	9.63
S1	0.6	15	0.65	0.05	0.30	9.22	7.37	9.72	9.73
S5	0.6	15	0.65	0.12	0.10	8.34	7.66	8.55	8.25
S2	0.6	15	0.65	0.12	0.30	7.14	6.75	7.61	7.38
S6	0.6	15	0.65	0.20	0.10	7.25	7.32	7.69	7.59
L4	0.6	15	0.65	0.20	0.20	6.49	6.28	7.15	7.08
S3	0.6	15	0.65	0.20	0.30	5.95	6.02	6.64	6.64
L1	0.6	15	0.65	0.20	0.40	5.50	5.56	6.19	6.21
L5	0.6	15	0.65	0.50	0.20	4.44	4.78	5.69	5.45
L2	0.6	15	0.65	0.50	0.40	3.08	3.37	4.18	4.37
L6	0.6	15	0.65	0.80	0.20	2.68	3.12	3.70	4.04
L3	0.6	15	0.65	0.80	0.40	1.21	1.44	1.44	2.63
YS12	0.6	10	0.30	0.13	0.20	1.88	1.65	2.30	---
YS17	0.6	10	0.65	0.13	0.20	4.75	4.37	5.37	---
YS18	0.6	10	1.00	0.13	0.20	7.44	6.70	8.60	---
YS10	0.6	15	0.30	0.20	0.20	2.56	2.36	3.06	---
YS15	0.6	15	0.65	0.20	0.20	6.49	6.21	7.15	---
YS14	0.6	15	1.00	0.20	0.20	10.26	10.04	11.46	---
YS13	0.6	20	0.30	0.27	0.20	2.93	2.92	3.67	---
YS11	0.6	20	0.65	0.27	0.20	7.44	7.64	8.61	---
YS16	0.6	20	1.00	0.27	0.20	11.80	12.34	13.75	---
YS24	0.8	10	0.30	0.13	0.20	1.22	1.20	1.87	---
YS23	0.8	10	0.65	0.13	0.20	3.37	3.21	4.36	---
YS21	0.8	10	1.00	0.13	0.20	5.51	5.20	6.98	---
YS25	0.8	15	0.30	0.20	0.20	1.67	1.70	2.48	---
YS19	0.8	15	0.65	0.20	0.20	4.99	4.94	5.78	---
YS22	0.8	15	1.00	0.20	0.20	8.28	8.25	9.26	---
YS20	0.8	20	0.30	0.27	0.20	1.94	2.09	2.96	---
YS27	0.8	20	0.65	0.27	0.20	6.02	6.45	6.95	---
YS26	0.8	20	1.00	0.27	0.20	10.10	10.64	11.09	---

In Figure 31, the joints have the same geometry but different crack sizes. For joint S4, the present result is much higher than Han's. However, the present result is more agreeable with Kim's and Hsu's results. The other joints agree quite well with all the methods, except joint L3. Hsu's result for joint L3 is much higher than the others.

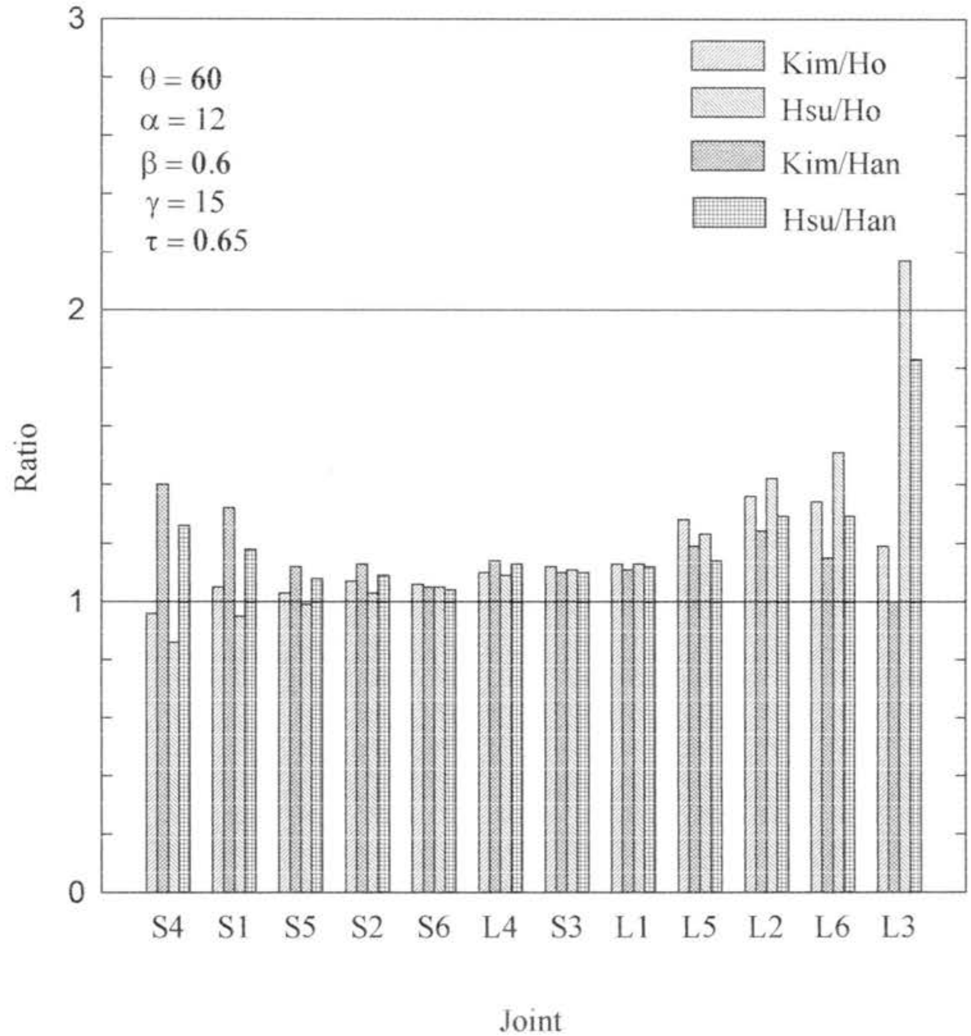


Figure 31. Comparison of Effective SIF (i)

The joints in Figure 32 have the same crack size - surface length of 66.67mm and depth of 6.67mm - but each joint has a different geometry. In this set of joints, no data is available from Hsu. The present results agree very well with Kim's results, with Kim's results on higher side.

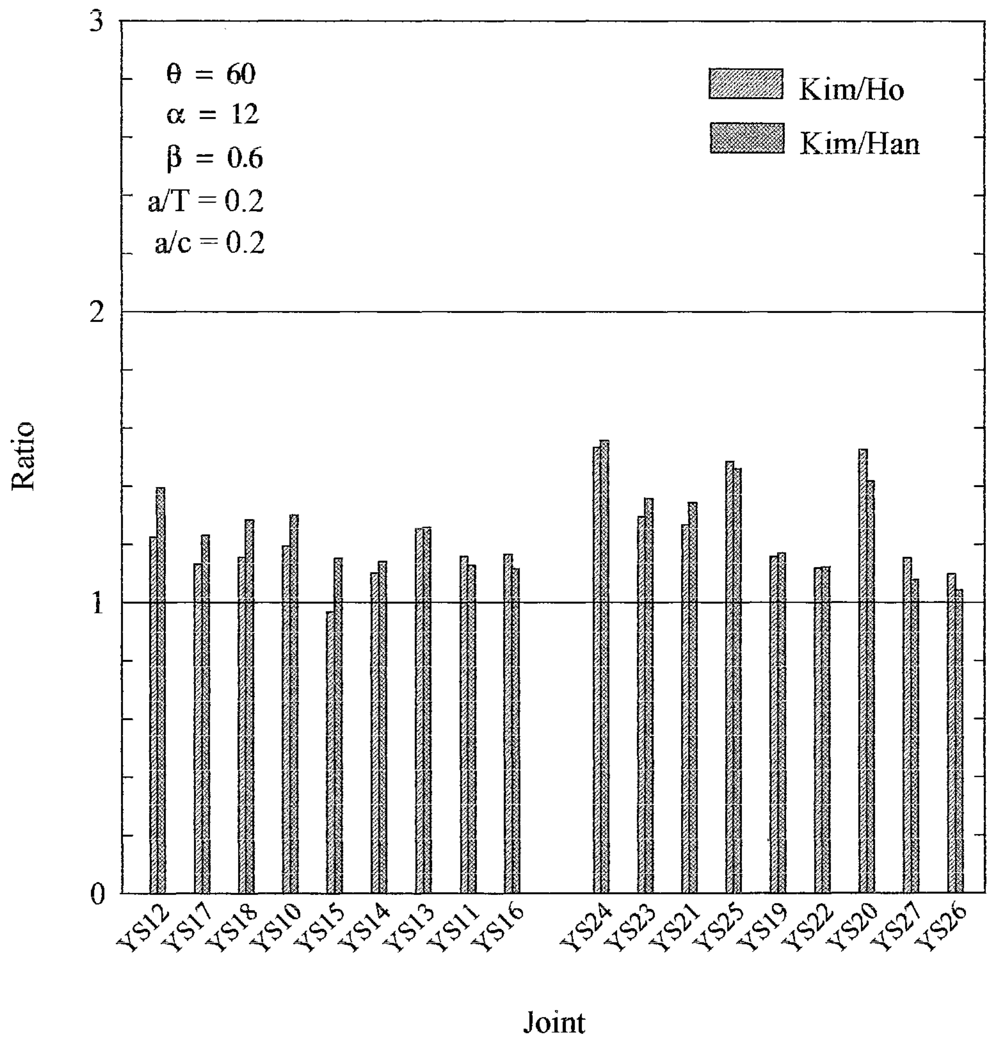


Figure 32. Comparison of Effective SIF (ii)

The present analysis employs the 3D finite element method. The above comparison shows that Hsu's and Kim's methods produce higher values for stress intensity factors than the 3D finite element method for most of the cases studied. Hsu obtains his solution by modifying the stress intensity factor of a flat plate. Kim solves the problem by computer package TJLIFE. Since both are approximate methods, a solution on the higher side is in order. On the basis of the comparisons discussed above, the present finite element model may be expected to provide a means for accurately computing stress intensity factors in cracked tubular joints. Therefore, the same model will be applied for all future analyses.

Effect of Location of Cracks on Stress Intensity Factors

For an uncracked joint, the hot-spot is the location where the maximum stress concentration occurs. Therefore, placing a crack at the hot-spot should produce a stress intensity factor that is higher than when the crack is placed at other locations. To verify this, cracks of the same size were placed at different locations along the weld toe of the chord. The joint was meshed using the same model mentioned previously. The results are shown in Figure 33.

In the figure, the stress intensity factor does not change significantly when the crack is placed anywhere between the hot-spot and the saddle. Therefore, it is not necessary to place a crack exactly at the hot-spot to obtain the maximum stress intensity factor. This is a great advantage in future analysis since, as mentioned previously, it is very difficult to model the crack at the exact desired location.

Although only one cracked joint is studied, it is still expected that placing the crack at the hot-spot will produce a maximum stress intensity factor. In Han's analysis, all cracks were placed at the saddle. In the present analysis, all cracks will be placed as close to the hot-spot as possible.

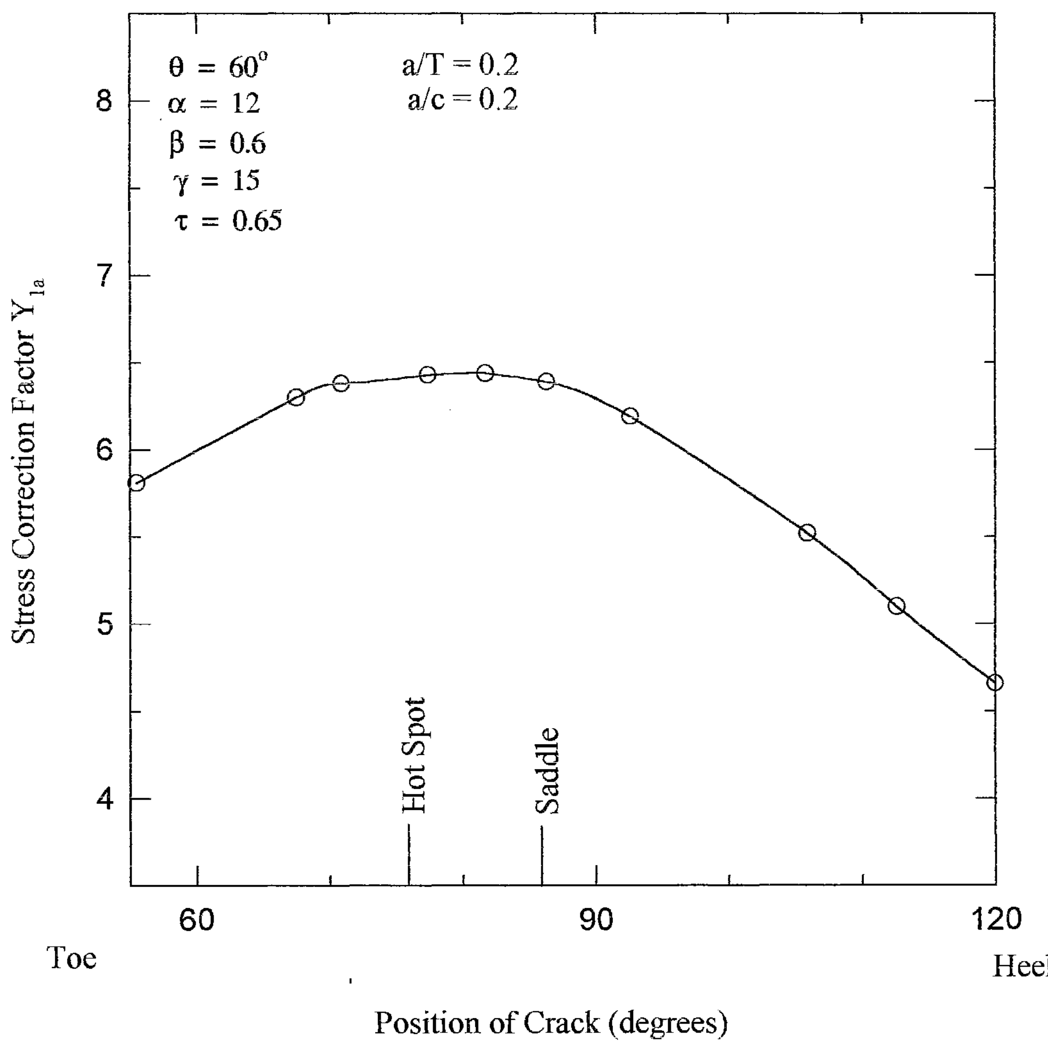


Figure 33 Effect of Position of Cracks on Y_{1a}

Variation of Stress Intensity Factors Along the Crack Front

The stress intensity factors of the three modes of fracture for the nodes along the crack front can be calculated using the module POSTSIF. Figure 34 shows the results of a typical joint with a crack at the hot-spot. The stress intensity factors are shown as the stress correction factors, Y_i. The stress correction factor of the first mode, Y_1, is much higher than the other two modes of fracture. For the curve Y_1, there is a peak near the mid-point of the crack. This peak value is taken as the stress correction factor at the deepest point, Y_{1a}, though the peak value may not be located exactly at the mid-point of the crack. The stress correction factors at the deepest point for the second and third mode, Y_{2a} and Y_{3a}, are taken as the values on the same location where Y_{1a} is taken. For the range of joints analyzed, the values of Y_2 and Y_3 are very low, so they have little effect on Y_e, the effective stress correction factor. As a result, the values of Y_1 and Y_e are very close.

The stress correction factor at the surface of the crack, Y_{1c}, is higher than that at the deepest point. This is due to difficulties in defining a normal to the crack front at the point where the curved crack front intersects the curved chord surface. Stress intensity factors at the surface will not be considered in this report.

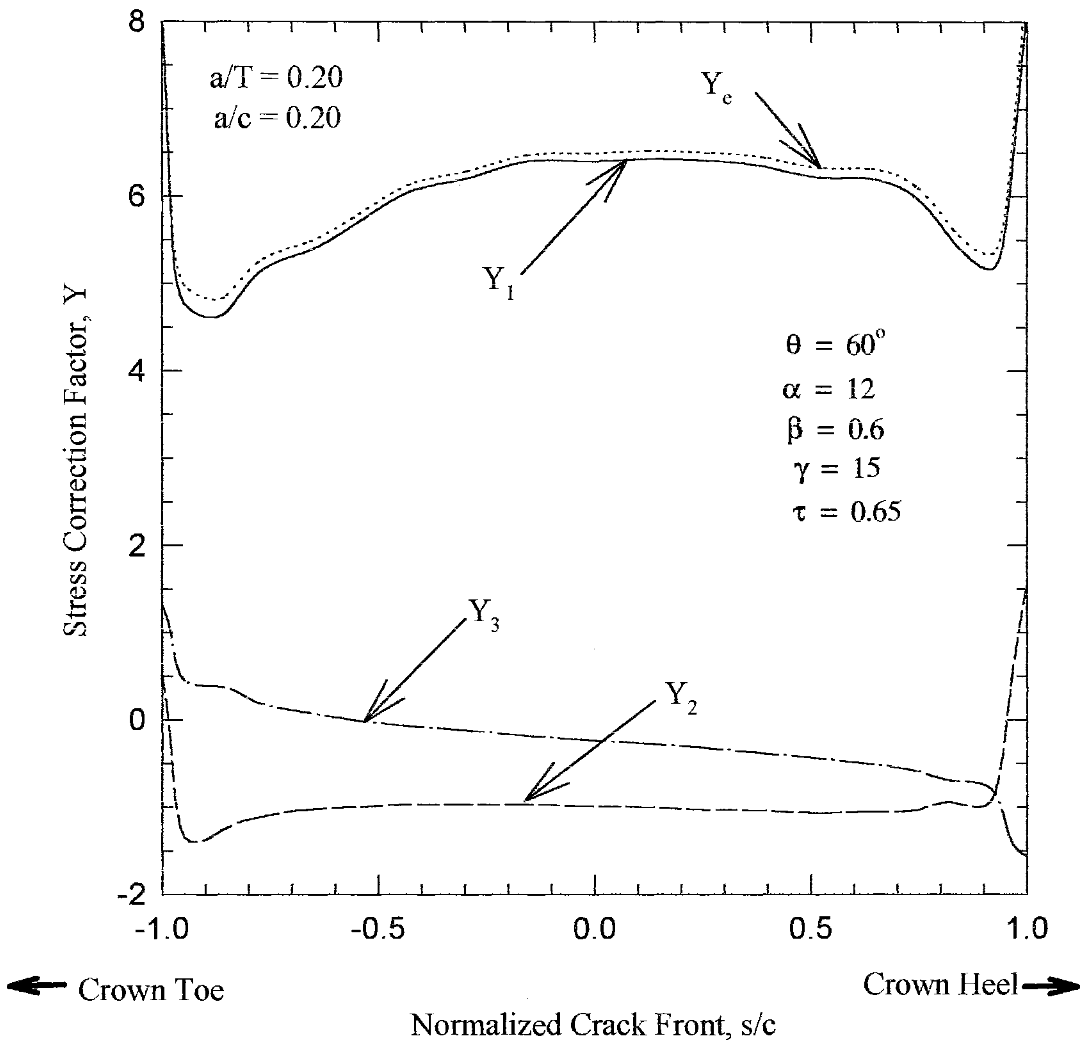


Figure 34. Variation of Stress Intensity Factors Along Crack Front

The curve Y_1 does not keep to the same shape for all joints. Its shape depends on the length and depth of the crack. For shallow cracks, as shown in Figure 35 where a/T=0.1, the curves have a peak near the mid-point of the crack. When the length of the crack reduces, i.e. when the a/c ratio increases, the peak tends to shift towards the crown heel side. Since stress intensity factor is at its highest near the center of the crack, the crack will grow faster through the wall thickness than across the surface. This is common for a shallow crack. The stress correction factors at the deepest point, Y_{1a}, are taken as the peak value, not the value at the mid-point of the crack.

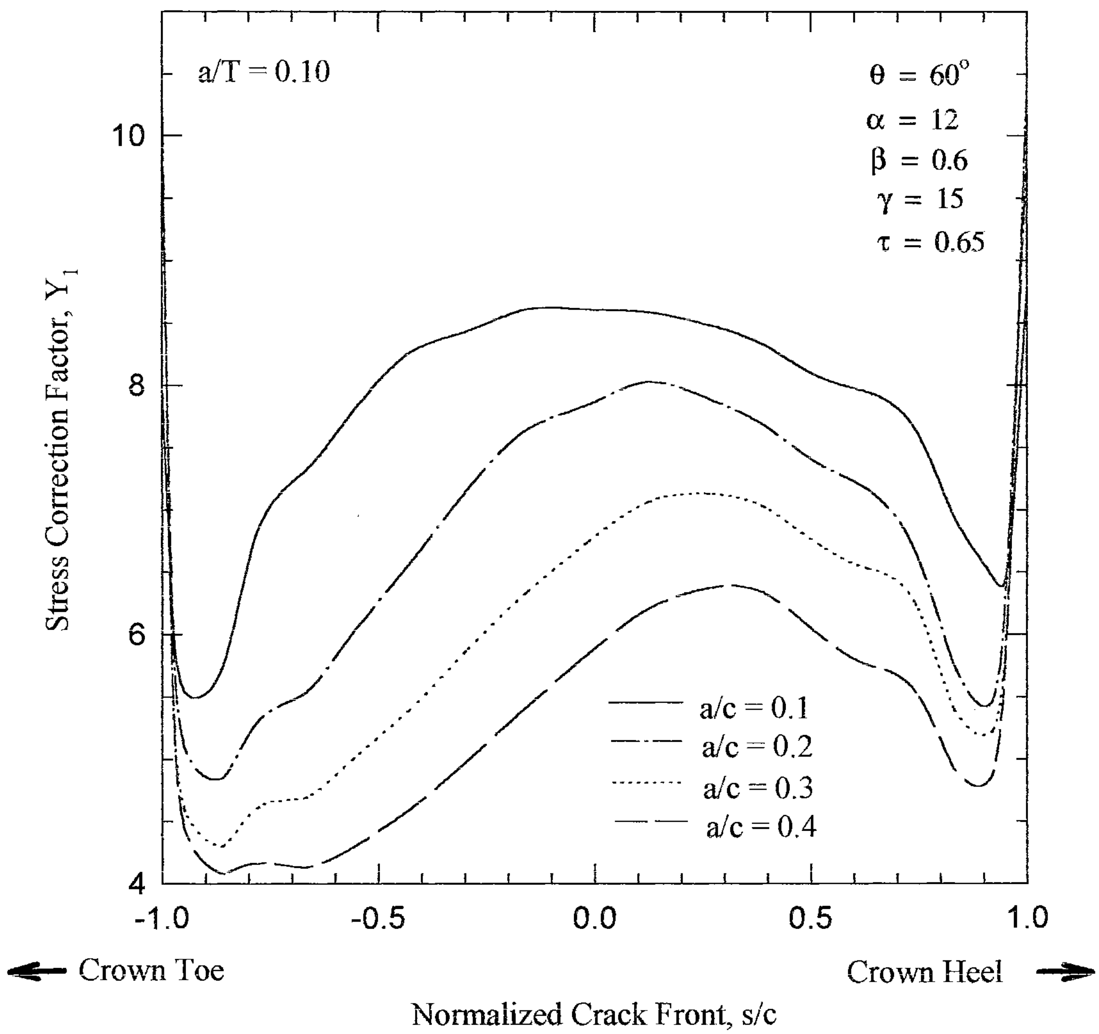


Figure 35. Variation of Y_1 Along Crack Front for a/T=0.1

When the depth of the crack increases, the peak reduces to a horizontal line at the center, such as shown in Figure 36. Figure 36 shows the case when a/T=0.4. The stress correction factor along the center portion of the crack becomes almost constant. When the curve is almost flat at the center portion of the crack, the value of Y_{1a} is chosen as the value at the mid-point of the crack.

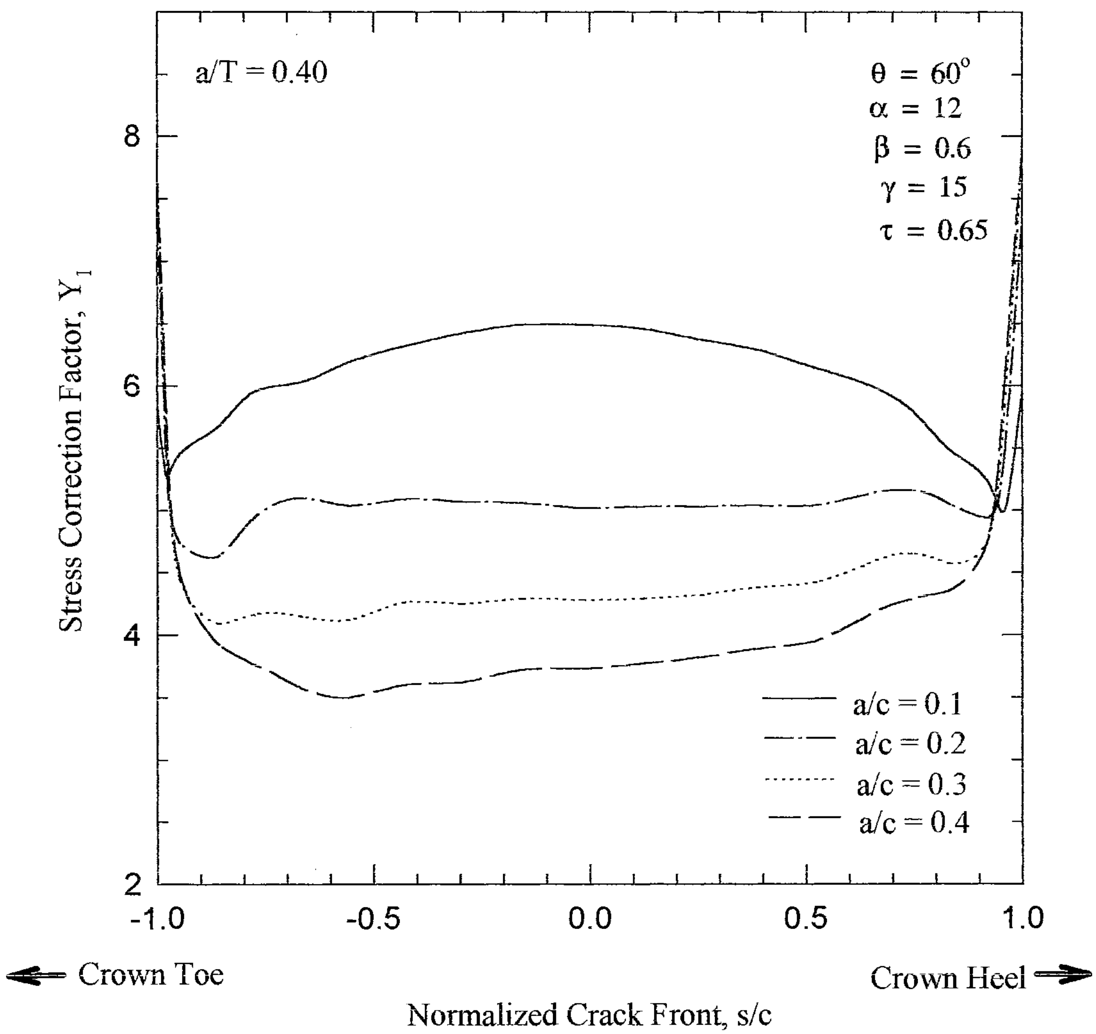


Figure 36. Variation of Y_1 Along Crack Front for a/T=0.4

When the depth of the crack increases still further, the curve changes from flat to concave upwards; that is, there is a minimum at the center. Figure 37 shows results for joints with a very deep crack, a/T=0.8. Since the stress intensity factor at center of the crack is the smallest, the crack will grow faster on the surface. For deep cracks, the minimum value near the mid-point of the crack is taken as the Y_{1a} value.

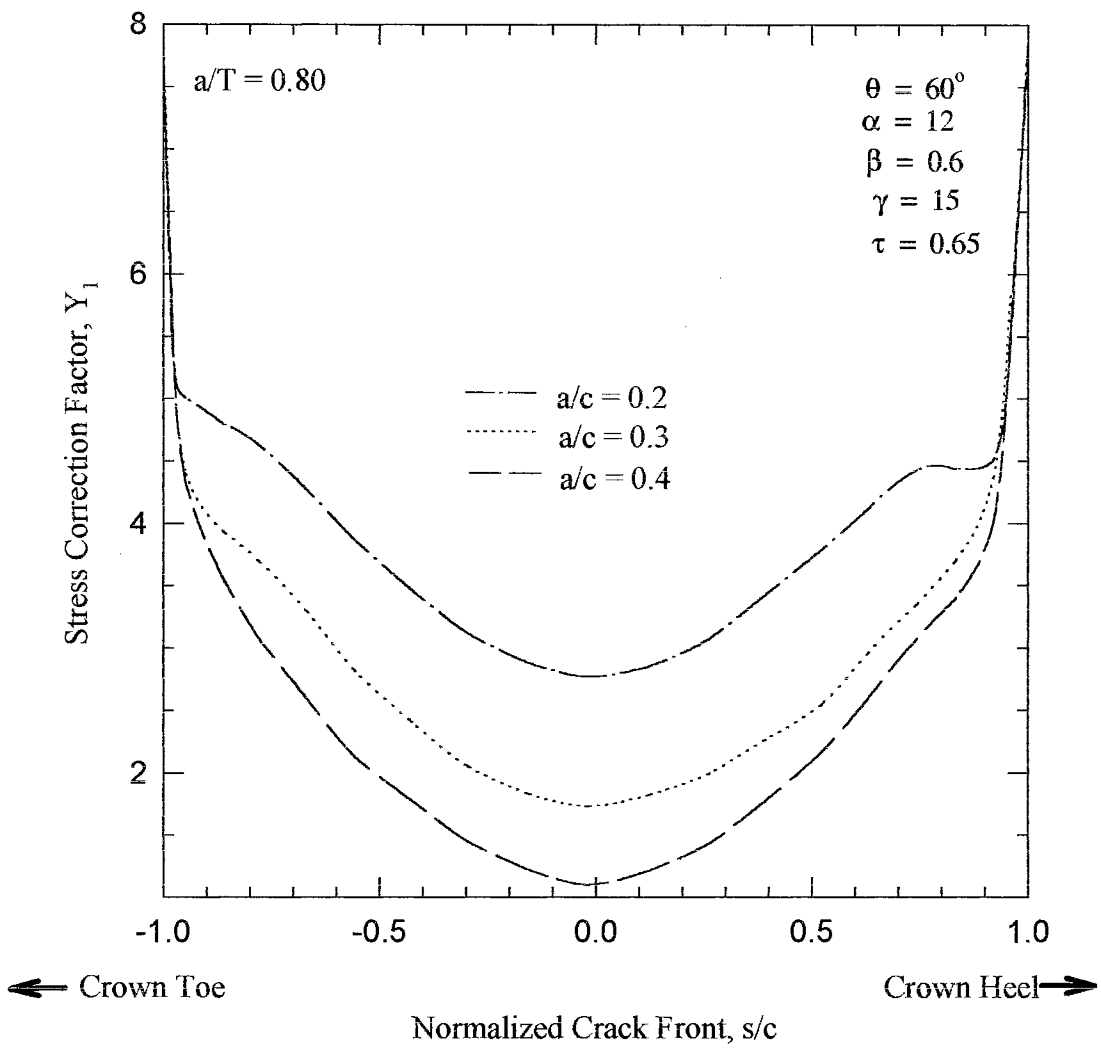


Figure 37. Variation of Y_1 Along Crack Front for a/T=0.8

The shape of the curve for Y_1 changes from concave downwards for a shallow crack to concave upwards for a deep crack. The stress intensity factor at the deepest point, Y_{1a}, may not be taken at the mid-point of the crack. However, the shape for the curves Y_2 and Y_3 does not change significantly. The stress intensity factor Y_{2a} and Y_{3a} are always taken as the same location where Y_{1a} is taken.

Finite Element Analysis Results

Approximately 1200 cracked joints have been analyzed. All these joints are 60° Y-joints with a chord diameter of 1000mm and a chord length of 6000mm. The brace has a length of 3000mm and diameters range from 600mm to 800mm. The joints are fixed at both chord ends and subjected to a brace axial tension. A semi-elliptical crack is placed at the hot-spot along the weld toe on the outer surface of the chord wall. The crack surface is perpendicular to the chord wall. The range of parameters covered is shown in Table 8. Joints with crack length longer than 200mm will not be analyzed.

Table 8

Range of Parameters

Parameter	Range
θ	60
α	12
β	0.6 to 0.8
γ	10 to 35
τ	0.2 to 1.0
a/T	0.1 to 0.8
a/c	0.1 to 0.4

The joint is modeled as described earlier. The tube is meshed with 8-node shell elements, the weld with 20-node solid elements with a row of 15-node transition elements between the shell and solid elements. Six 20-node collapsed hexagonal elements are used at the crack tip.

The results are tabulated in Appendix D. A representative sample of the results is shown in the following figures. Figure 38 shows the results for a joint with thick chord wall but thin brace wall (γ=10 and τ=0.2). Results for cracks with different a/T and a/c ratios are plotted. In the figure, the ratio Y_1/SCF is used as the vertical axis. The stress concentration factor for this joint is 1.61. As seen from the figure, for a/c=0.3 and a/c=0.4, the stress intensity factor varies directly with the ratio a/T. For a/c=0.2 and a/c=0.1, the line is discontinued because the length of the crack is longer than 200mm for higher values of a/T. Joints with crack length longer than 200mm are not analyzed.

For a constant a/T, the stress intensity factor decreases as the ratio a/c increases. Increasing a/c means reducing the length of the crack. A smaller crack will have a smaller stress intensity factor.

For a constant a/c, the stress intensity factor decreases as the ratio a/T increases. Increasing a/T means increasing the depth of the crack. When the depth of the crack is increased, less uncracked thickness remains to resist the load. Since the degree of bending is high, over 0.7 for all cases analyzed, bending stress is the main stress component. A reduction in thickness will reduce the stiffness; thus causing the stress to drop at that location. Therefore, stress intensity reduces as a/T increases.

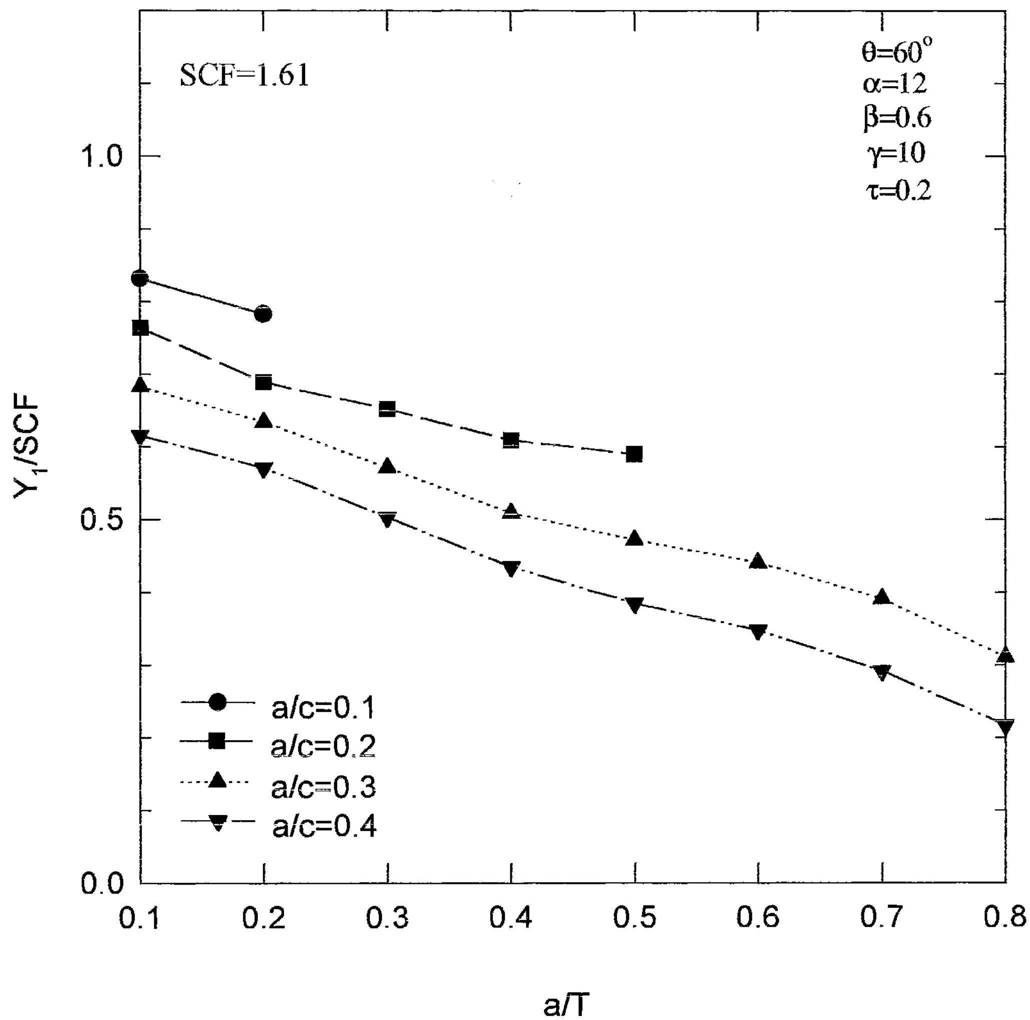


Figure 38. SIF Results for β=0.6, γ=10 and τ=0.2

The joint analyzed for Figure 39 has the same geometry for that in Figure 38, except with a thicker brace wall. The parameter τ is 0.4. The curves for a/c=0.3 and 0.4 are very close to a straight line.

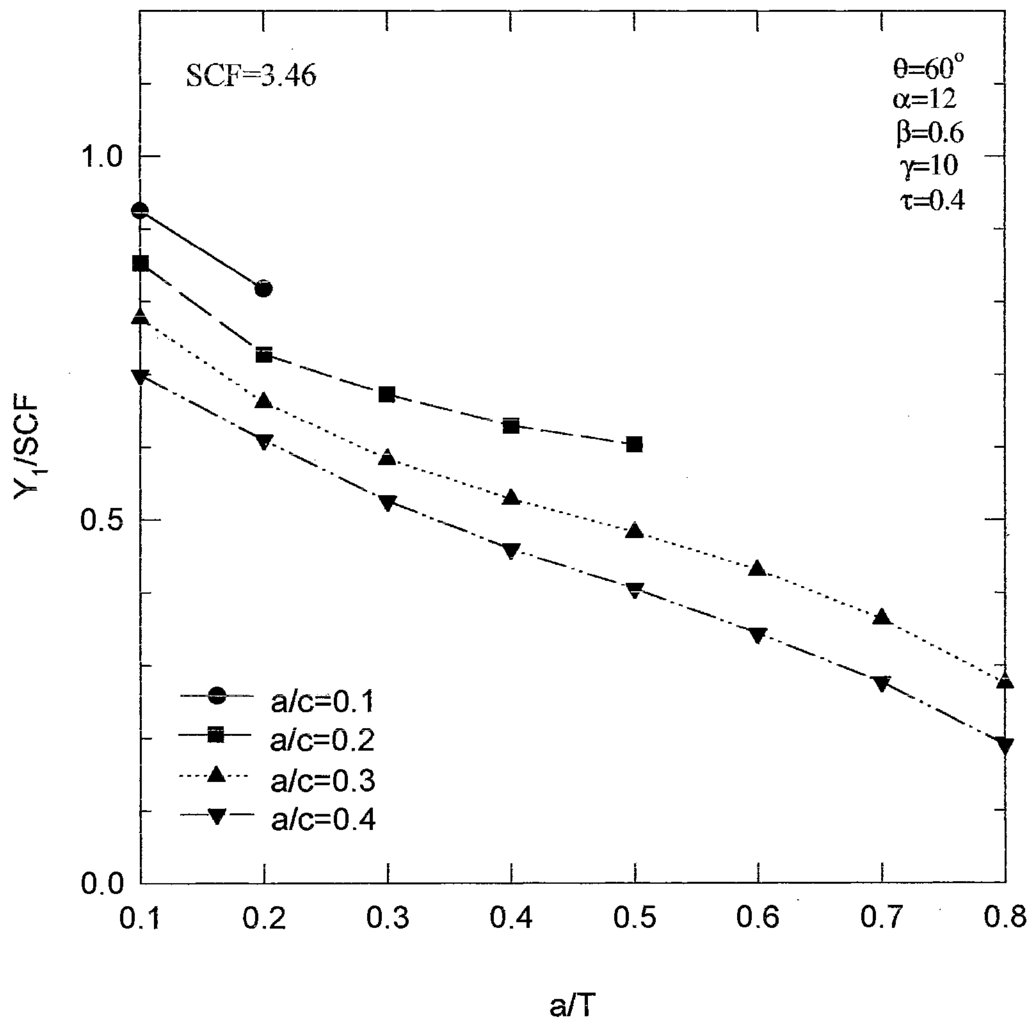


Figure 39. SIF Results for β=0.6, γ=10 and τ=0.4

The joint analyzed for Figure 40 has a thinner chord wall. The parameter γ is 20 and τ is 0.6. The curves shown are still very close to a straight line except for a/c=0.1

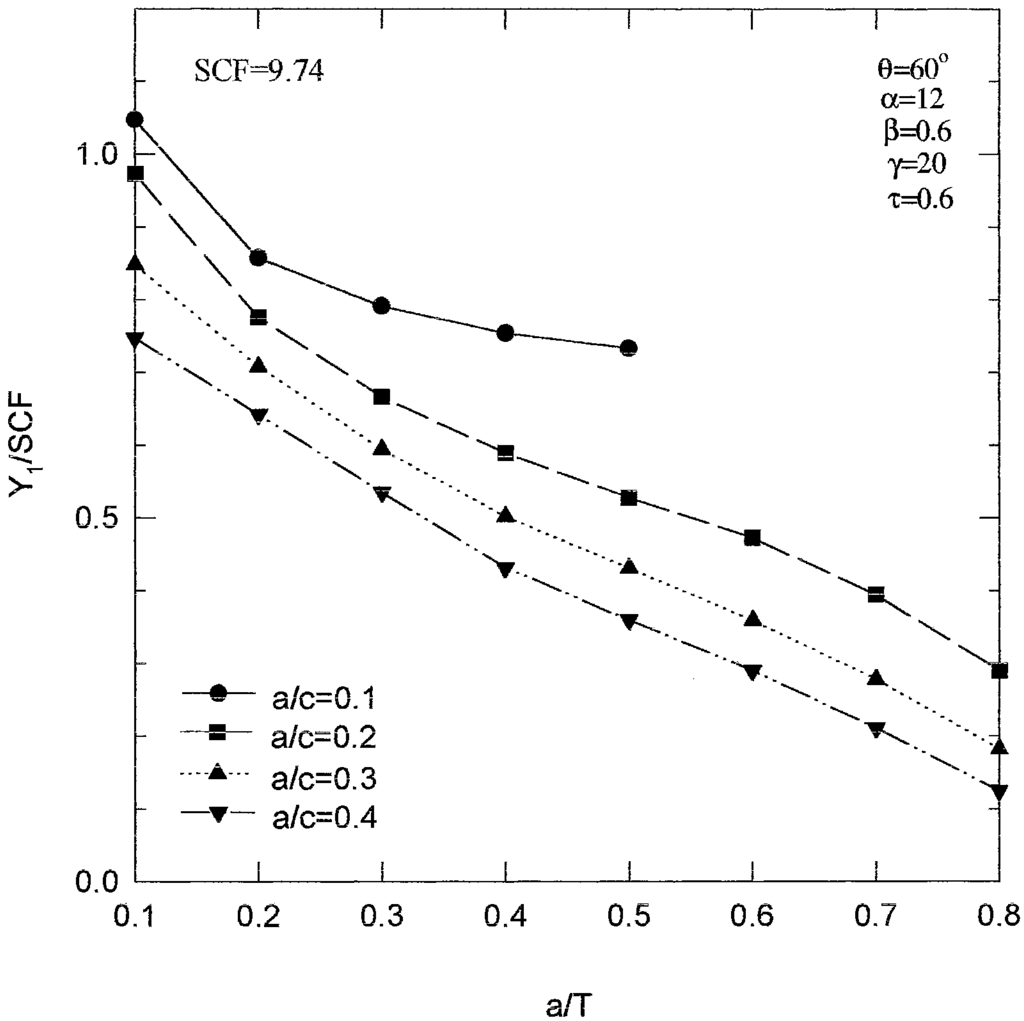


Figure 40. SIF Results for β=0.6, γ=20 and τ=0.6

In Figure 41, the chord wall is further reduced. The parameter γ is 30 and τ is 0.8. Except for a/c=0.1, the curves shown in the figure are very close to a straight line.

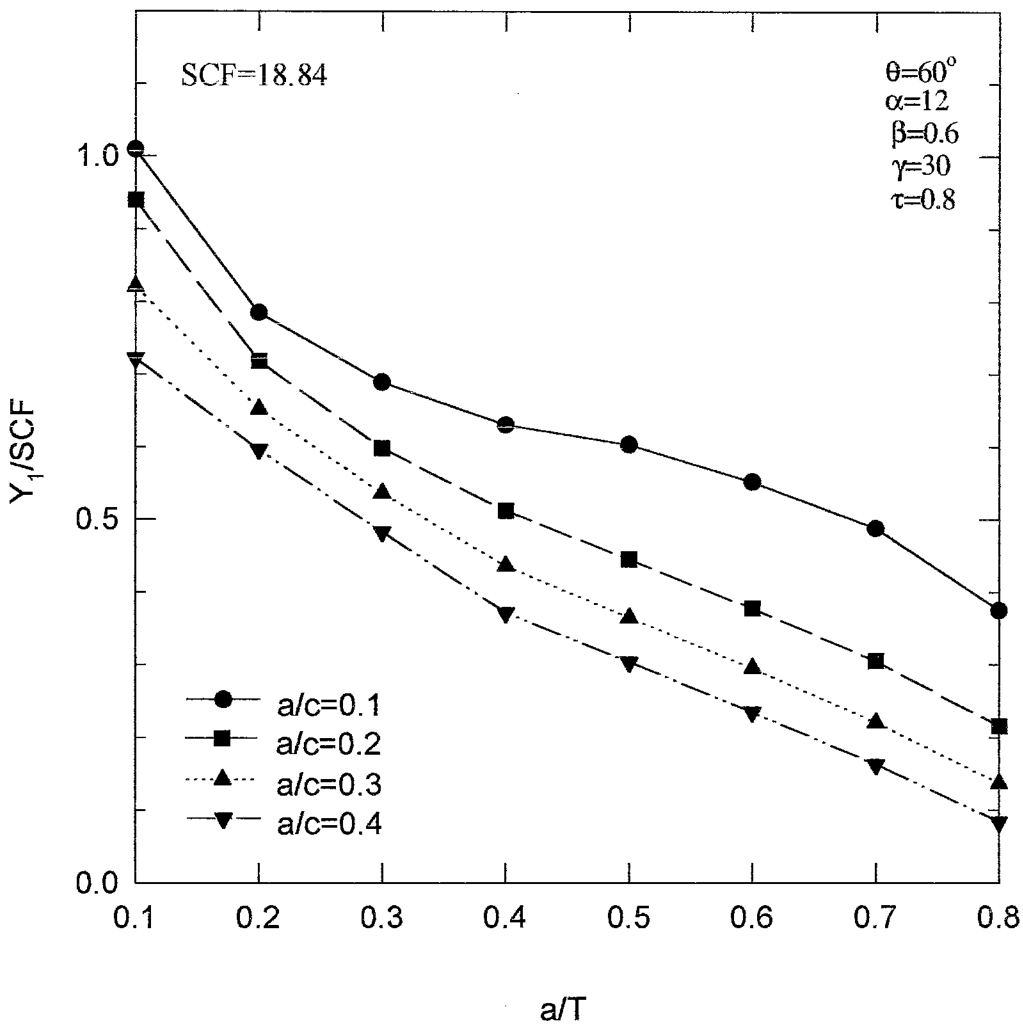


Figure 41. SIF Results for β=0.6, γ=30 and τ=0.8

The joint analyzed for Figure 42 has the same geometry as that shown in Figure 41 except with a thicker brace wall. The parameter τ is changed to 1.0. The curves shown are very closed to a straight line.

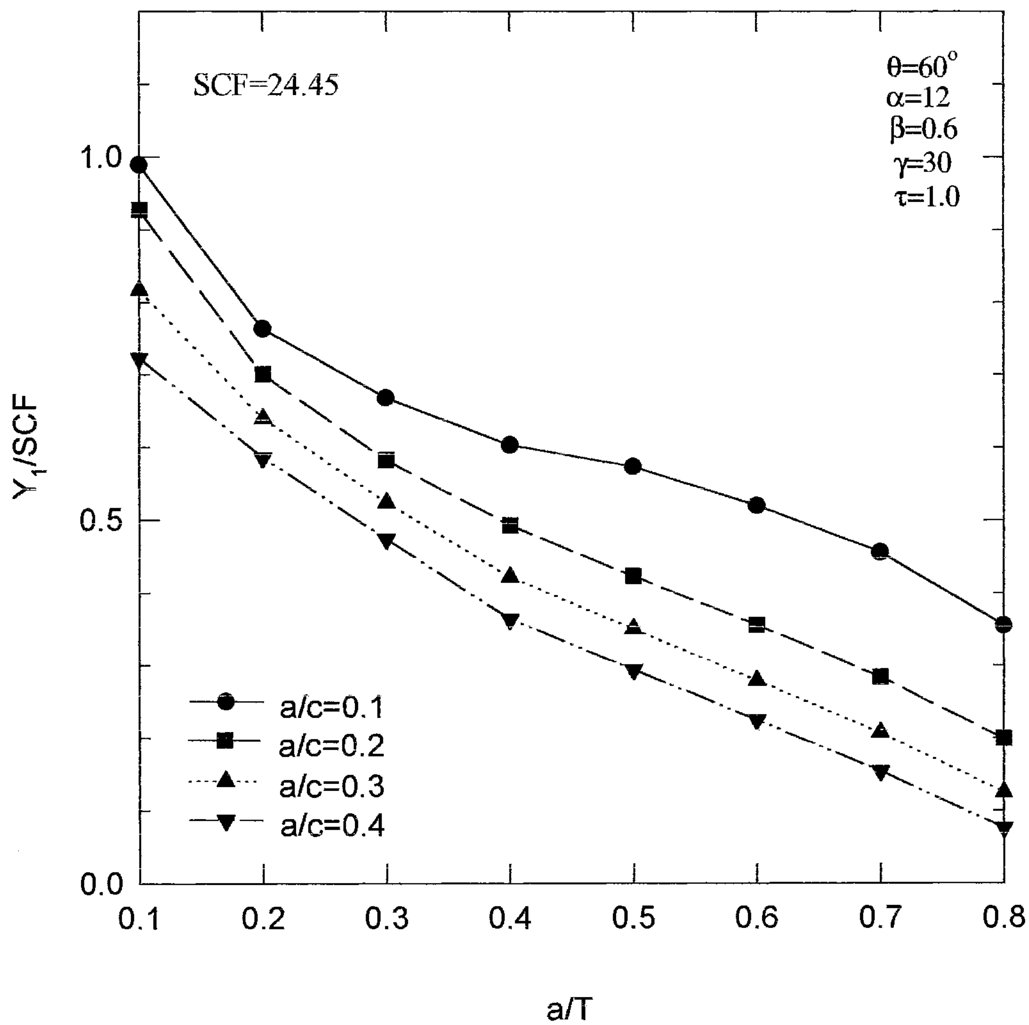


Figure 42. SIF Results for β=0.6, γ=30 and τ=1.0

The following two figures show results for joints with larger brace diameter. The parameter β is 0.8 for both figures. In Figure 43, the parameter γ is 10 and τ is 0.2; in Figure 44, γ is 20 and τ is 1.0. Both figures show that the ratio Y_1/SCF varies directly with a/T.

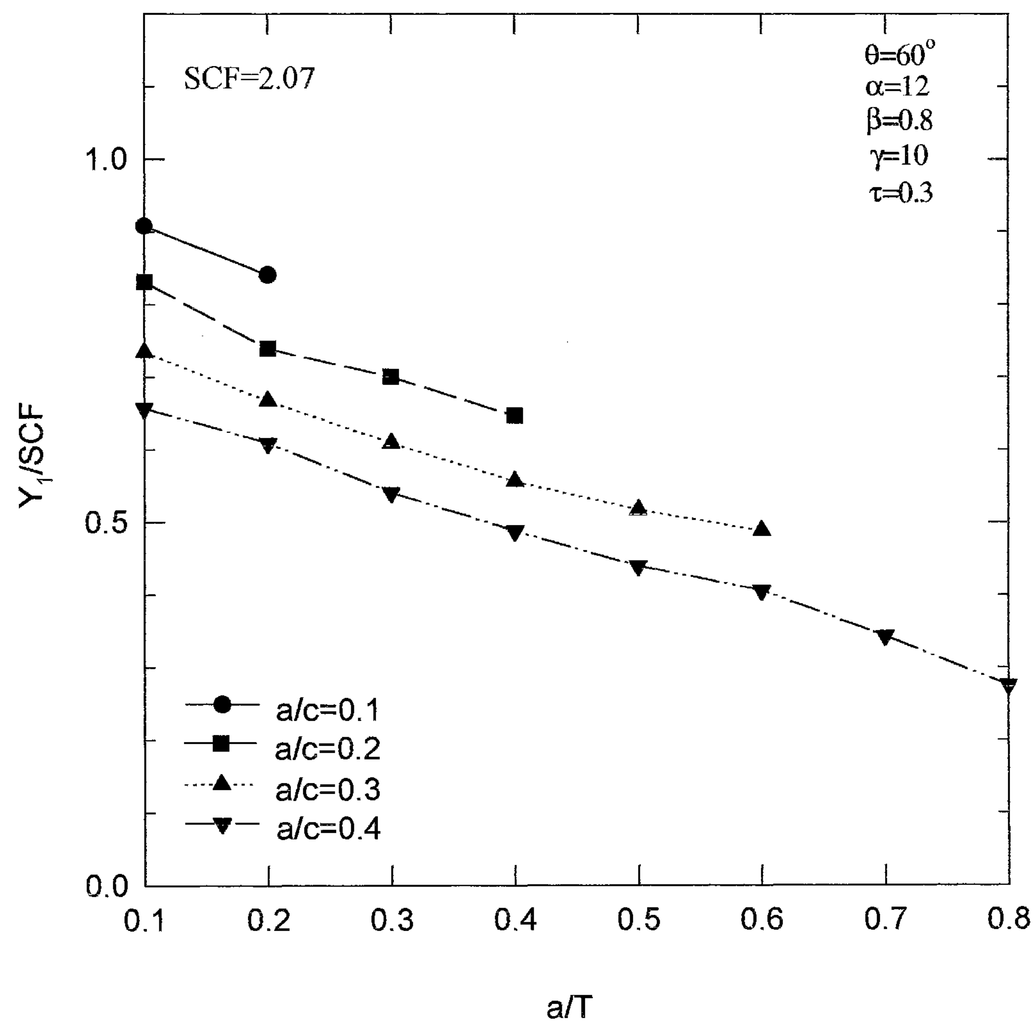


Figure 43. SIF Results for β=0.8, γ=10 and τ=0.3

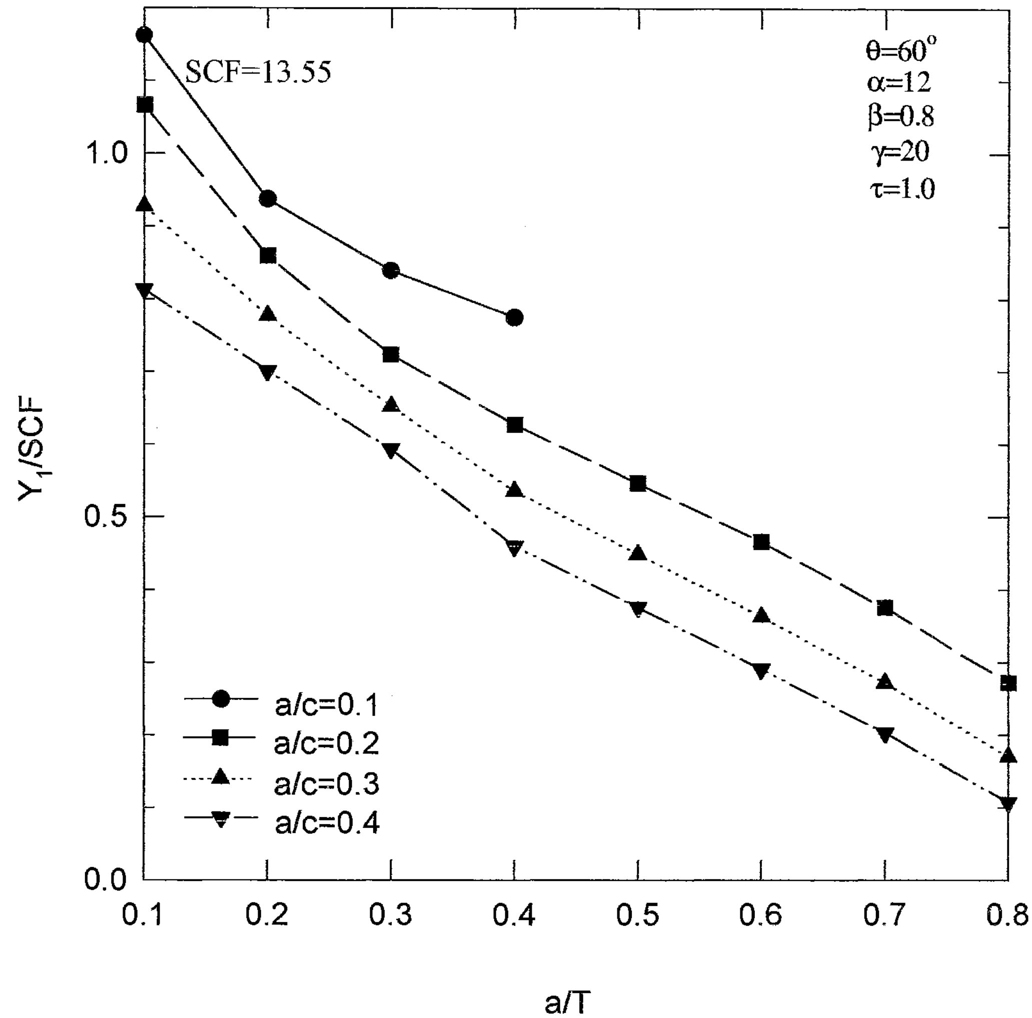


Figure 44. SIF Results for β=0.8, γ=20 and τ=1.0

Based on a study of all the figures shown, it can be concluded that for a joint with cracks of constant a/c ratio, stress intensity factor varies directly with a/T.

CHAPTER VI

COMPARISON OF SIF WITH EXISTING SIMPLIFIED METHODS

Review of Existing Simplified Methods

Many authors had suggested methods to calculate stress intensity factors for tubular joints. Some authors simplify the model of the joint analyzed, others try to fit empirical equations through data obtained either by finite element analysis or experiments. Some of the most commonly used methods are discussed below.

Kim[37] analyzed cracked joints with the computer program TJLIFE, which is a linear elastic fracture mechanics based fatigue crack growth analysis for tubular joints. TJLIFE produces results on the higher side as shown in the previous chapter.

Hsu[34] suggests that stress intensity factors in tubular joints can be separated into membrane and bending stresses. The total stress intensity factor is the sum of the two, i.e.

$$K_{total} = K_M + K_B$$

where K_M and K_B are stress intensity factors due to membrane and bending stresses.

The individual stress intensity factor, K_M or K_B, can be obtained by modifying the stress intensity factor for an infinite plate under membrane or bending stresses with a stress variation correction factor, M_C, and a notch factor, M_K. Therefore, the stress intensity factor for a joint subjected to membrane or bending stress is:

$$K = M_C M_K Y \sigma_{hs} \sqrt{\pi a}$$

where Y = correction factor for a surface crack in a flat plate,

M_C = ratio of stress around crack front to hot spot stress,

M_K = notch correction factor.

Hsu's method has the advantage of obtaining the stress intensity factor around the crack front. However, in order to obtain the factor M_C, analysis of an uncracked joint with a very fine mesh around the hot spot area is required.

Rhee, Han and Gipson[60] propose a method which is based on fitting a curve through data available. The basic equation takes the form:

$$K = F_g F_j F_s \sigma_n \sqrt{\pi a}$$

where $F_g F_j F_s$ are geometry factor, crack size factor, and joint/crack coupling factor respectively. These factors are complicated functions of β, γ, τ, a and c.

Haswell[25] has proposed a simplified method to calculate the stress intensity factor. Haswell's method is based on the analysis of 70 planar joints with cracks at chord saddle. For Y-joints subjected to brace axial tension with a/c=0.2, Haswell suggests that the ratio of stress intensity factor to hot-spot stress is linearly proportional to the degree of bending in the joint, i.e.

$$\frac{K_{1a}}{\sigma_{hs}} = A - B * DoB$$

where σ_{hs} = hot spot stress in the chord. The values of parameters A and B, shown in Table 9, depend on a/T. The equation can be expressed as a series of straight lines as shown in Figure 45.

Table 9

Parameters A and B based on Haswell's Method

a/c	a/T	Upper Bound of A	Mean Value of A	Slope B
0.2	0.2	4.228	4.028	0.248
0.2	0.4	8.138	7.938	3.865
0.2	0.6	13.436	13.096	9.407
0.2	0.8	16.717	16.317	14.196

Haswell's method is simple, an empirical equation consisting of only two parameters A and B. The effect of joint geometry, load pattern, and boundary conditions are incorporated into the stress concentration factors and degrees of bending. However, the set of parameters published are limited to cracks with a/c ratio of 0.2 only.

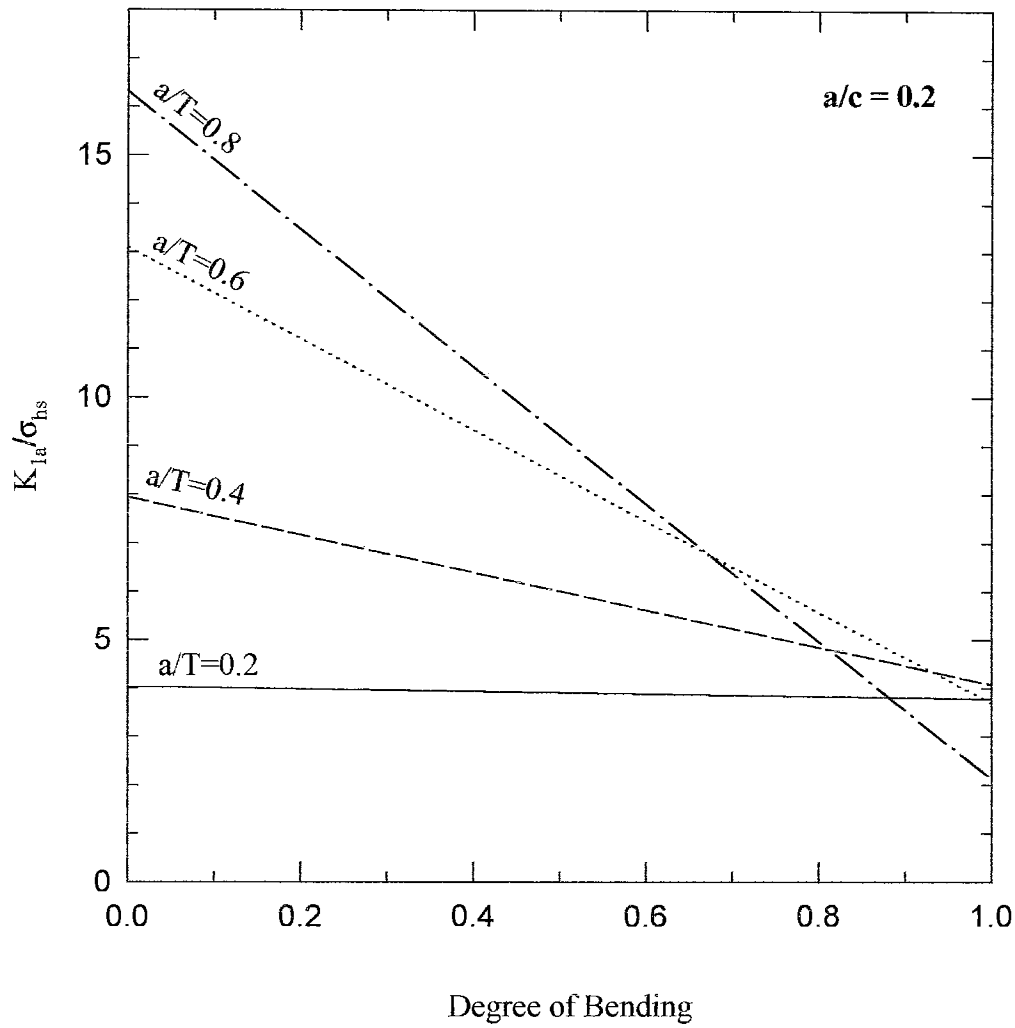


Figure 45. Stress Intensity Factors Based on Haswell's Method

In document PD6493:1991, BSI[2], a simplified method to calculate stress intensity factors at the surface or deepest point of the crack is proposed. In this method, the stress at the hot-spot is broken into membrane and bending stress components using the degree of bending. For semi-elliptical cracks at the root of the weld toe on tubular joints, stress intensity factors can be obtained by modifying the stress components by correction functions. In general,

$$K = \left[\frac{M_{km} M_m \sigma_m + M_{kb} M_b \sigma_b}{\Phi} \right] \sqrt{\pi a}$$

where σ_m = the membrane stress component,

σ_b = the bending stress component

a = the crack depth

M = the correction functions, and

Φ = the complete elliptic integral of the second kind.

The elliptic integral Φ can either be obtained from standard tables or calculated from the equations provided. The correction functions M_m and M_b depend on crack size and shape. The factors M_{km} and M_{kb} take into account the stress concentrations when the crack is located at the weld toe. Parametric equations are given to calculate these M functions.

UK Methodology Working Group proposed that the bending stress component used in PD6493 should be modified by a linear moment release correction, i.e.

$$\sigma_b' = \sigma_b * (1 - a/T)$$

The stress intensity factor can be calculated in the same way as in PD6493, using the modified bending stress component. The modified equation is

$$K = \left[\frac{M_{km} M_m \sigma_m + M_{kb} M_b \sigma_b'}{\Phi} \right] \sqrt{\pi a}$$

The correction factors M and elliptic integral Φ are calculated in the same manner as proposed by PD6493.

Comparison of Results with Haswell's Method

The present analysis results are used to check the reliability of Haswell's method. Stress intensity factors are calculated using Haswell's equation for comparison to the present results. Recalling Haswell's equation:

$$\frac{K_{1a}}{\sigma_{hs}} = A - B * DoB$$

and the more general form for K_{1a}:

$$K_{1a} = Y_{1a}\sqrt{\pi a}\,\sigma_n$$

Equating K_{1a} from the two equations and solving for Y_{1a}:

$$Y_{1a} = \frac{SCF}{\sqrt{\pi a}}\left(A - B * DoB\right)$$

where SCF = Stress concentration factor

DoB = Degree of bending, and

a = depth of crack.

Haswell's Y_{1a} depends on stress concentration factor, degree of bending of the joint and the depth of the crack. In calculations to produce results which follow, both the stress concentration factor and degree of bending were obtained by the author as reported in Appendix B. The crack depth "a" is the actual depth used in finite element analysis, and the mean value of the parameter "A" is used. Results based on Haswell's method are compared with the finite element results as shown in Table E2, Appendix E. There are four tables in Appendix E. Each table refers to a different a/c value. Haswell's method is only valid for a/c=0.2 and a/T = 0.2, 0.4, 0.6 or 0.8. Joints not in this range are not compared. It is seen that stress intensity factors based on Haswell's equation are greater than results from the finite element analysis in most cases, even though only the mean value of "A" is used. The difference increases when γ and a/T increase. The difference can be as large as 200%.

The basis of Haswell's method is that the ratio K_{1a}/σ_{hs} is linearly proportional to the degree of bending in the joint. Results for selected joints are plotted with the ratio K_{1a}/σ_{hs} against the degree of bending as shown in Figures 46 and 47.

Figure 46 shows the case where the cracks have an a/T ratio of 0.2. In Haswell's method, no limit is set on the degree of bending. However, the actual degree of bending in the chord with brace axial tension has a very narrow range, from 0.72 to 0.87. For joints with the same β and γ value, the larger the τ, the larger the degree of bending. Each data point in the figure represents a joint with a different τ value. Values for τ range from 0.2 to 1.0. For a/T=0.2, Haswell's proposal is in good agreement with the present results when γ=10, but over-estimates when γ is larger than 10.

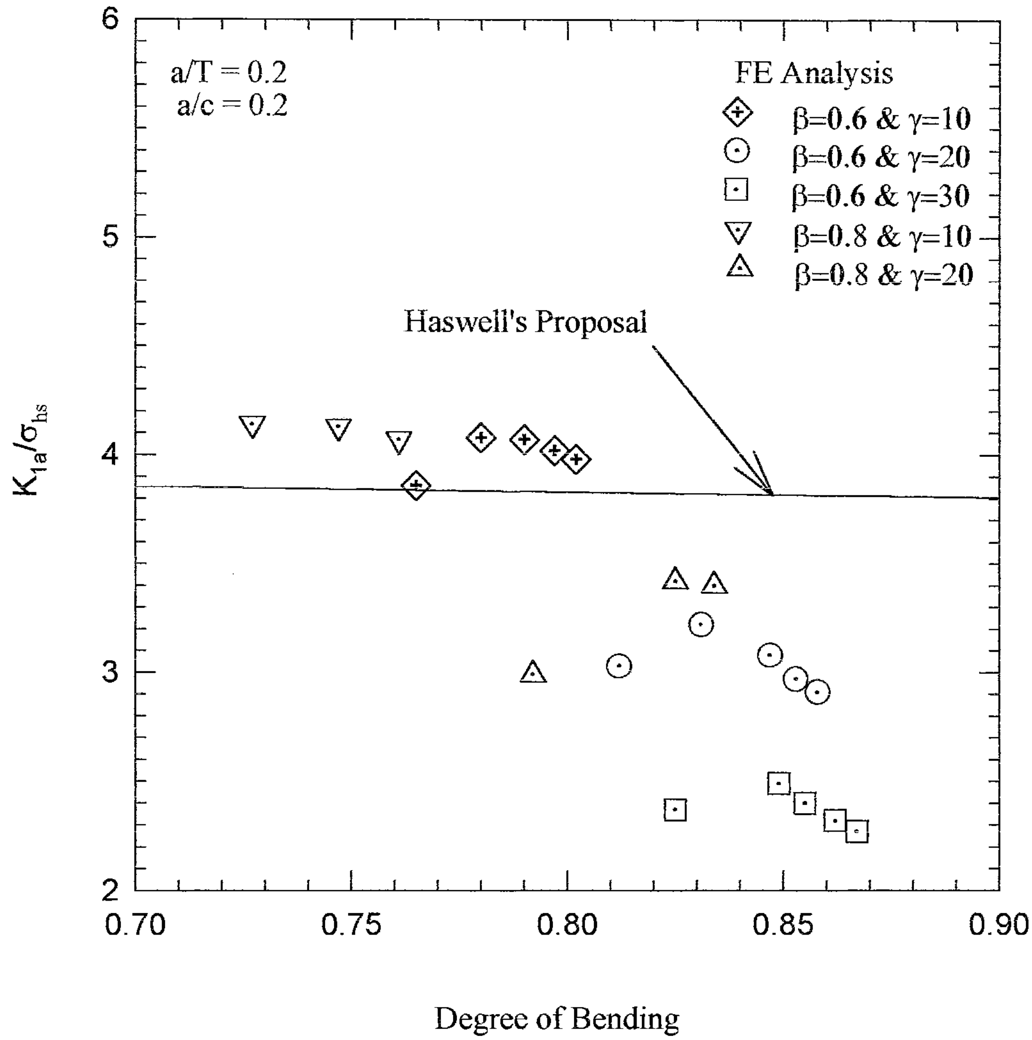


Figure 46. Comparison of SIF with Haswell's Method for a/T=0.2

Figure 47 shows joints with cracks that have a/T ratio of 0.8. It is seen that Haswell's proposal is on the high side for all joints shown.

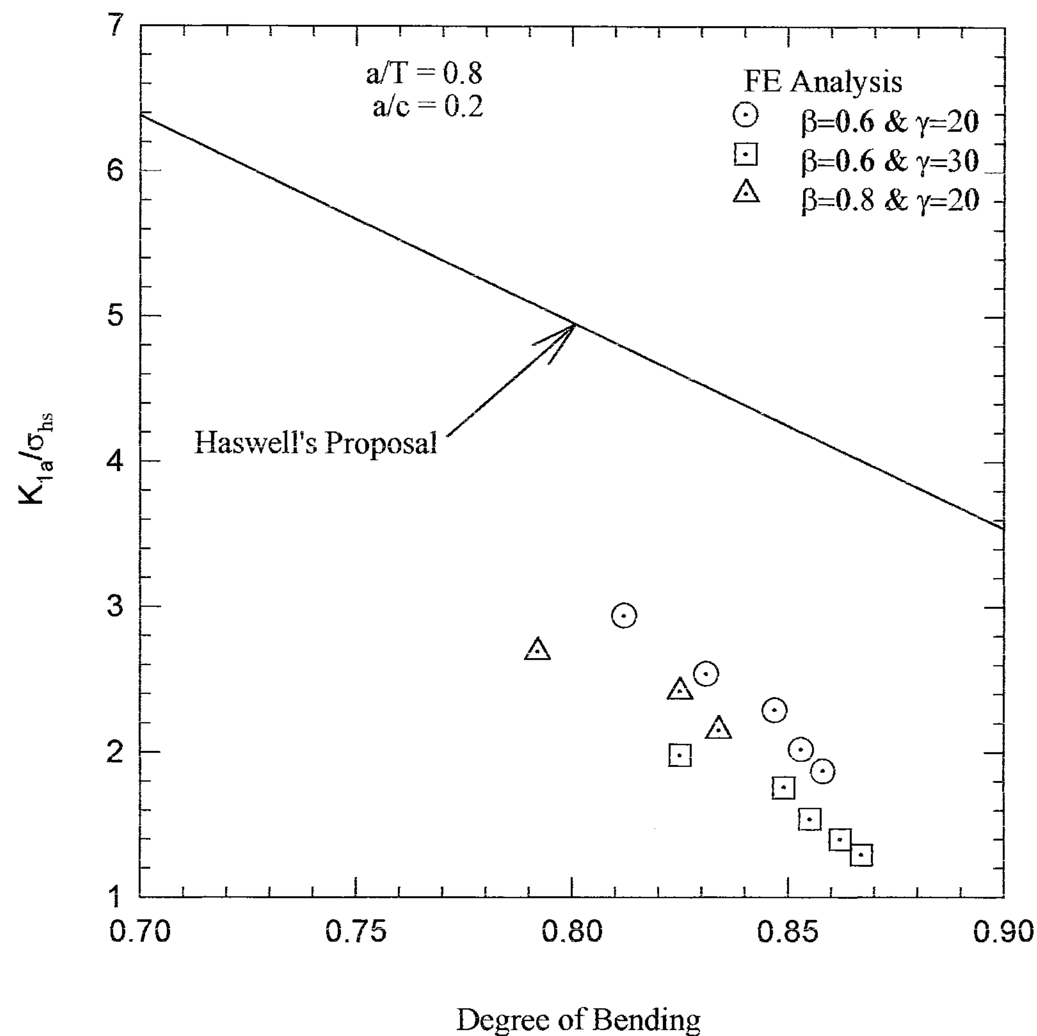


Figure 47. Comparison of SIF with Haswell's Method for a/T=0.8

There are a few drawbacks to Haswell's proposal. First, the stress correction factor should be dimensionless. However, according to Haswell, it depends on the depth of the crack, "a". Two joints, one with all dimensions (including the crack) double the other, will have the same β, γ, τ, a/c and a/T values, so they should have the same stress correction factors. According to Haswell's method, these two joints will have different stress correction factors because the depth of the crack, a, is different. In Haswell's equation, the parameters "A" and "B" should have a dimension of $\sqrt{(length)}$ in order to make Y_{1a} dimensionless. But Haswell gives the parameters as dimensionless values.

In Haswell's proposal, no limit was set on degree of bending. For the range of joints analyzed in this research, degree of bending lies between 0.72 to 0.87. As shown in Fig. 45, the lines proposed by Haswell for different ratios of a/T cross in the region between 0.7 and 1.0. In other words, for cracks with different ratios of a/T, the stress intensity factors are very close. The present results show that stress intensity factors vary directly with a/T. This is why Haswell's proposal does not provide a good estimate of stress intensity factors.

Comparison of Results with Method Suggested by PD6493, BSI

The method suggested by PD6493, BSI[2], is used to calculate stress intensity factors at the deepest point for all the joints analyzed in this research. Calculated results are shown in Appendix E for comparison. In the calculations, the distance from the weld toe to the inside of the brace is taken as 1.5 times the thickness of the brace. The author has also performed calculations using 2 times the thickness of the brace, with a result only 2% higher. As seen in Appendix E, the stress intensity factor proposed by BSI is on the safe side in most cases. The number of cases that are underestimated is less than one-half percent of the total cases analyzed, and the maximum underestimated error never exceeds

10%. The results are best when a/T is small, i.e., for a shallow crack. When a/T is large, the error can be as high as 300% on the high side.

Figure 48 shows the comparison with finite element results when a/T is small, only 0.2. It is seen that stress intensity factors based on BSI PD6493 are slightly higher than those obtained by finite element analysis. The BSI method produces a very good estimation in this case.

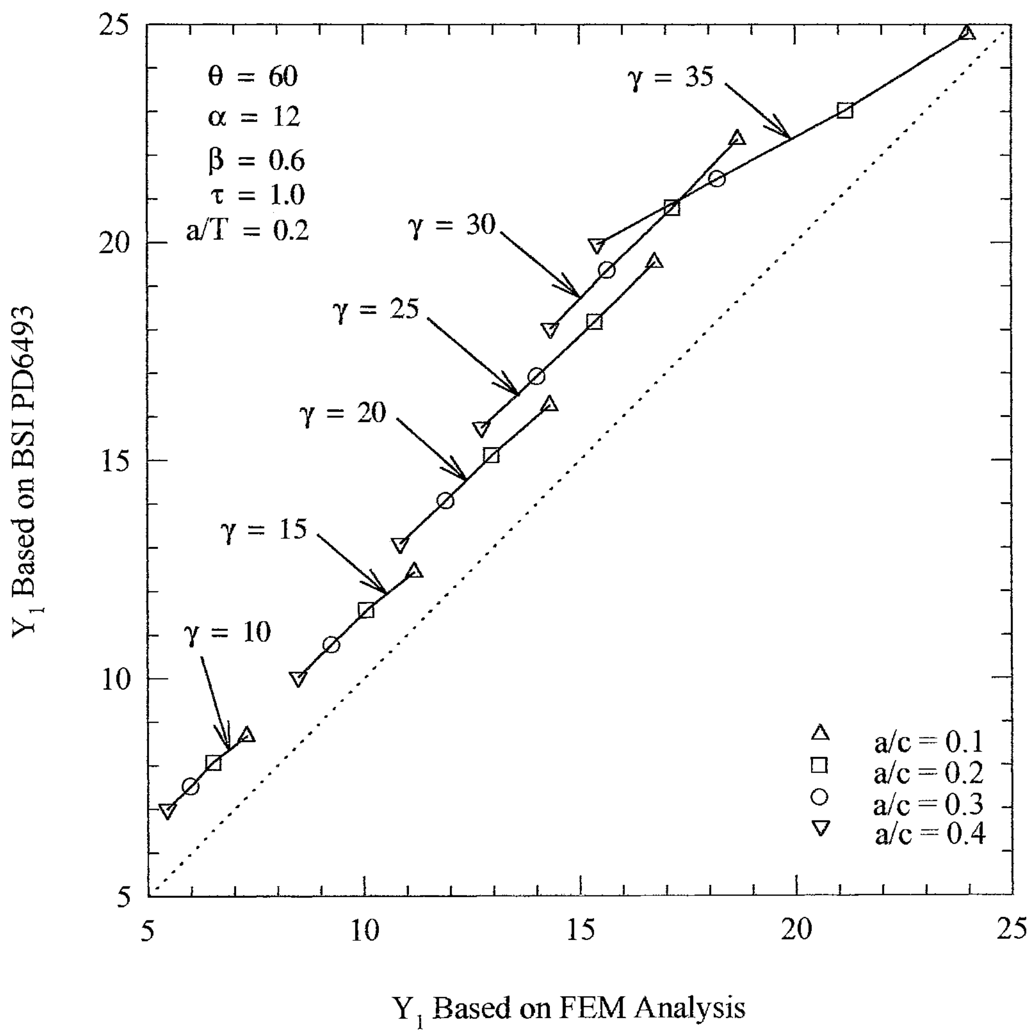


Figure 48. Comparison of SIF with BSI's Method for a/T=0.2

Figure 49 shows joints with greater crack depth. The stress intensity factor based on BSI PD6493 is much higher than that obtained by finite element analysis. The greatest percentage difference occurs when γ is 35 and a/c is 0.4. In this case, the difference between the stress intensity factor based on BSI PD6493 and the finite element analysis is 304%. However, the high percentage is due to a small stress correction factor. The greatest numerical difference occurs when a/c is 0.1.

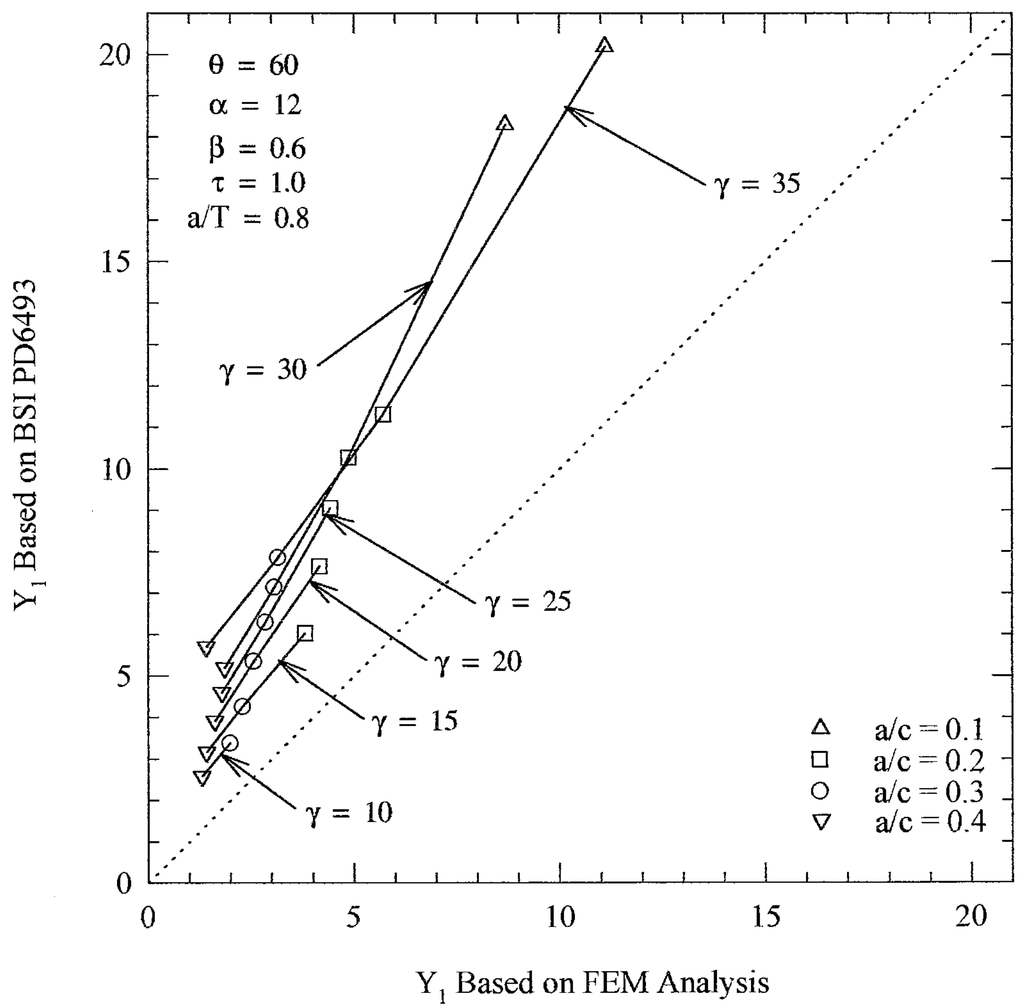


Figure 49. Comparison of SIF with BSI's Method for a/T=0.8

The method proposed in BSI PD6493 produces stress intensity factors that are on the safe side. After going through all the numbers in Appendix E, the stress intensity factors are about 10 to 40 percent higher than those obtained by finite element analysis in the practical range of joint parameters. The only disadvantage of this method is that the procedure in computing is quite complicated.

Comparison of Results with Method Based on PD6493, BSI; But Modified by Linear Moment Release Function

Stress intensity factors based on PD6493 are always higher than that of the finite element analysis. As the depth of the crack increases, the difference between results based on PD6493 and the finite element results increases. The UK Methodology Working Group proposed to modified the bending stress component by a linear moment release correction, (1-a/T).

Stress intensity factors of all the joints are calculated in the same manner as proposed by PD6493, except that the bending stress component is first modified by multiplying it with (1-a/T). The results are also shown in Appendix E. The stress intensity factor for many joints based on this method is lower than the finite element results.

Figure 50 shows joints that are the same as those shown in Figure 48. By comparing the two figures, the stress intensity factors based on this modified method are closer to the finite element results, but some of the stress intensity factors are on the lower side.

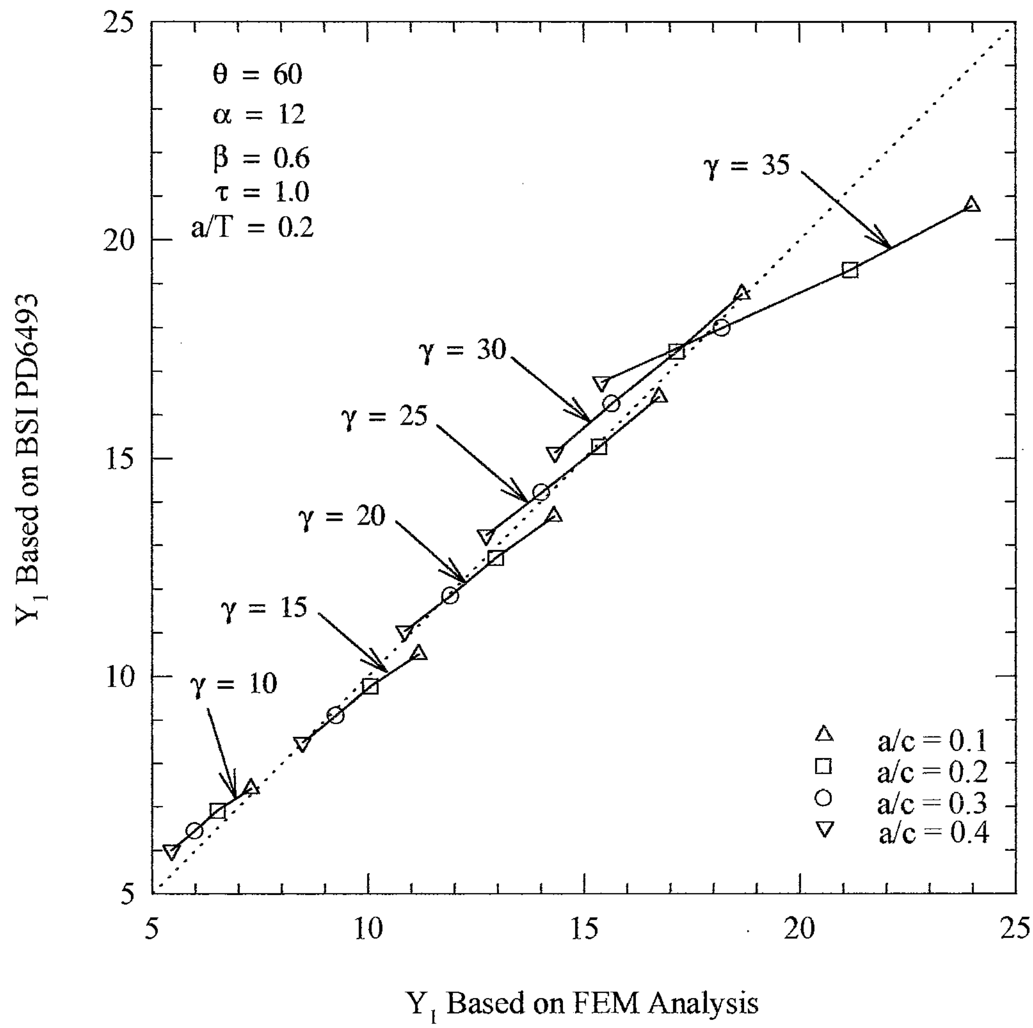


Figure 50. Comparison of SIF with Modified BSI's Method for a/T=0.2

The joints in Figure 51 are the same as those shown in Figure 49. These joints have deep cracks, with a/T=0.8. The stress intensity factors based on the modified method agree very well with the finite element results.

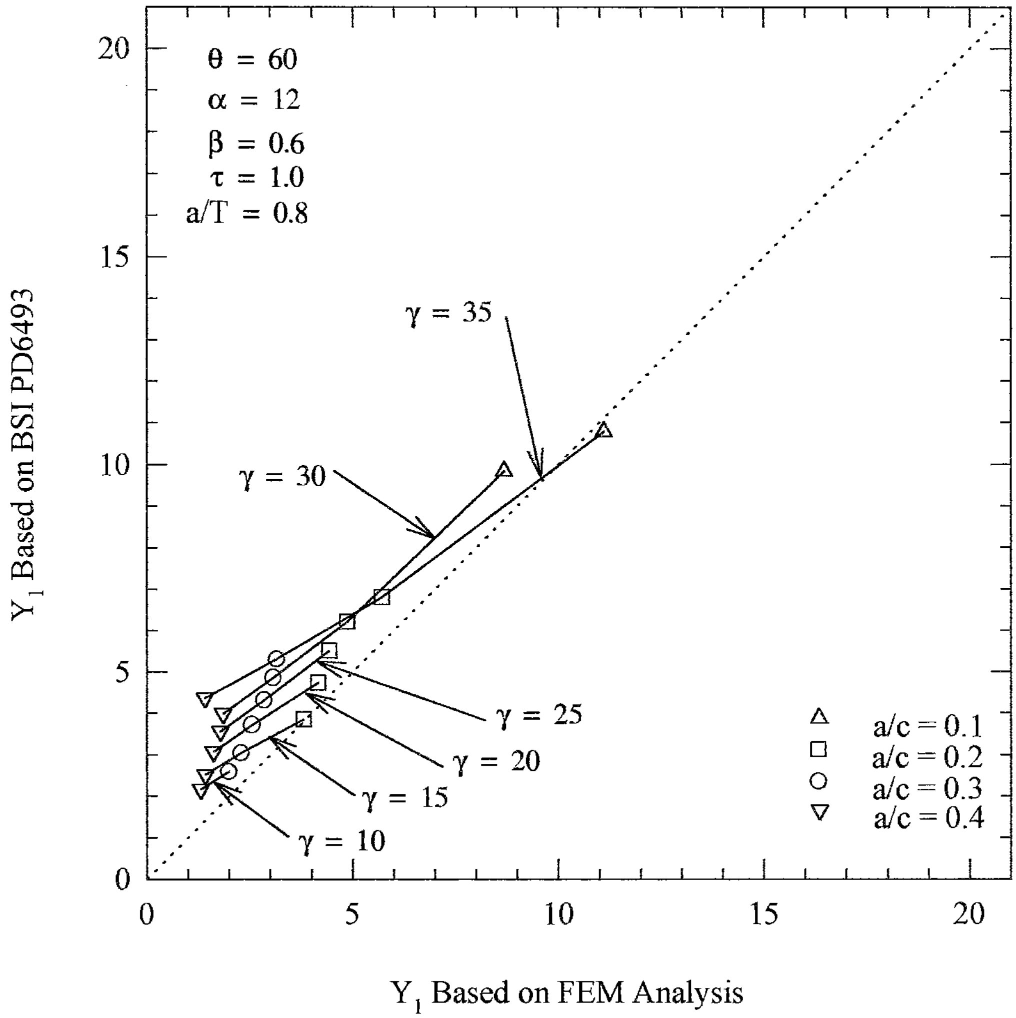


Figure 51. Comparison of SIF with Modified BSI's Method for a/T=0.8

The stress intensity factors for the joints shown in the above two figures agree very well with the finite element results. However, as shown in Appendix E, stress intensity factors for majority of the joints based on this modified method are lower than the finite element results.

CHAPTER VII

PROPOSED SIMPLIFIED METHOD

Effect of Joint Parameters on Stress Intensity Factors

Before proposing a simplified method to calculate stress intensity factors, the effect of the joint parameters should be studied. The present research included three joint parameters, namely β, γ and τ. The effect of each parameter on stress intensity factors is summarized below:

Effect of β on Stress Intensity Factors

The parameter β is the ratio of the diameter of the brace to the diameter of the chord. Only two β values, 0.6 and 0.8, are studied at present. In generating the finite element mesh with PRETUBE, the software generates a wrong weld profile when β values are higher than 0.8. A high β value means that the diameter of the brace is approaching the diameter of the chord. In this situation, the weld profile near the saddle is different from the standard profile. The software does not take into account the change of the weld profile. Therefore, the largest β value analyzed in the present research is 0.8.

The following two figures show the effect of β on stress intensity factors. Both figures use Y_1/SCF as the vertical axis. Figure 52 shows joints with the same γ value of

15 and same τ value of 0.3 but different β values. The two lines representing two different β ratios are very close together. This shows that the ratio Y_1/SCF does not vary much between β of 0.6 and 0.8.

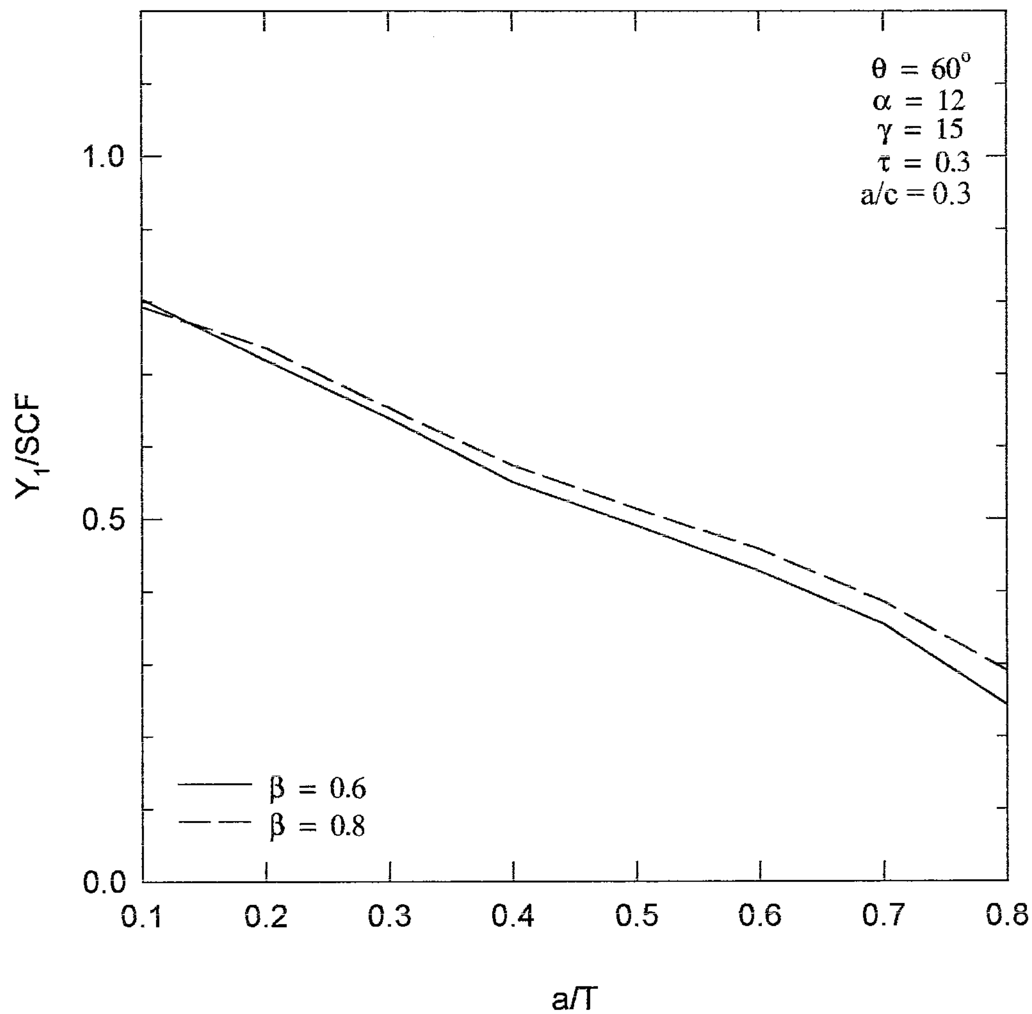


Figure 52. Effect of β on SIF for γ=15, τ=0.3 and a/c=0.3

Figure 53 shows joints with higher γ and τ values. Again the two lines representing two different β ratios are very close. Therefore, the ratio Y_1/SCF is only moderately influenced by β, even for joints with higher γ and τ values.

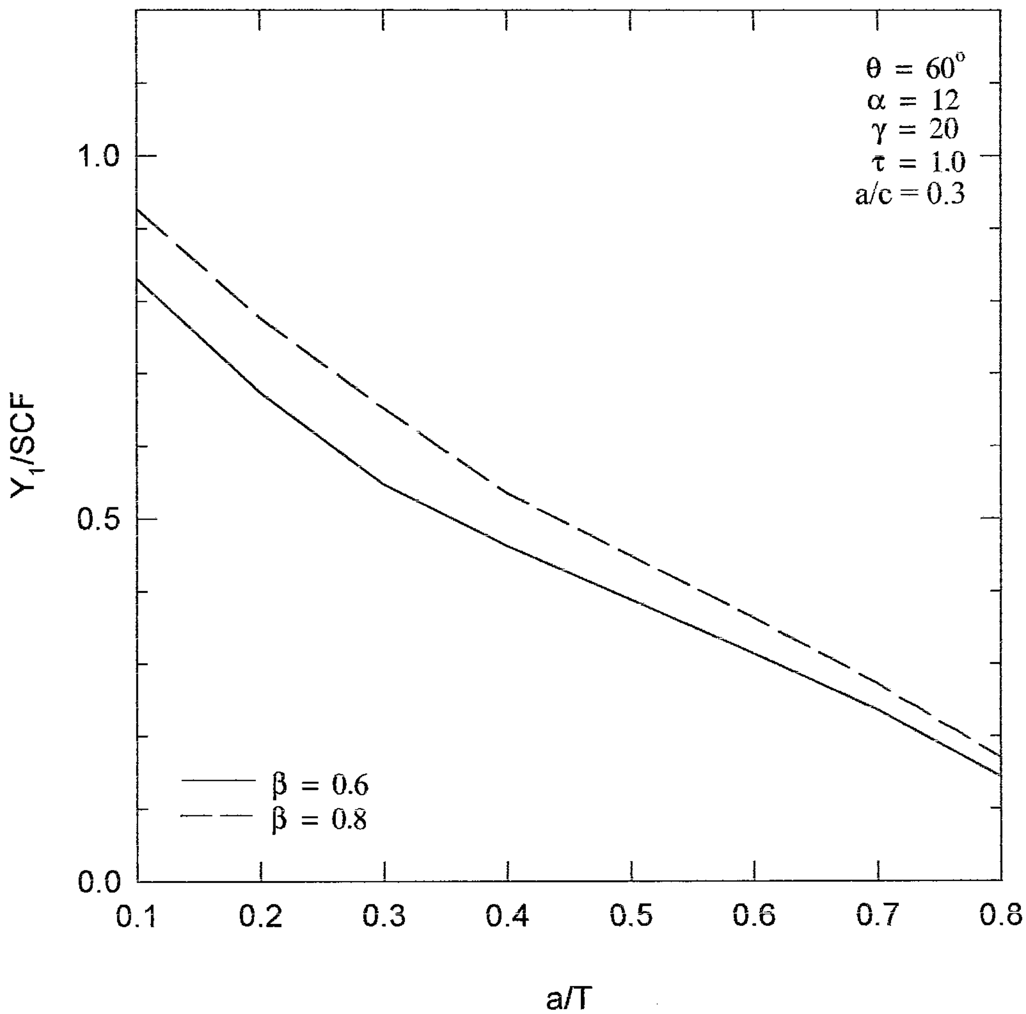


Figure 53. Effect of β on SIF for γ=20, τ=1.0 and a/c=0.3

As shown from the previous two figures, the effect of the parameter β on the ratio Y_1/SCF is negligible for the range of γ and τ studied.

Effect of γ on Stress Intensity Factors

The parameter γ was studied over the range from 10 to 35. Its effect on stress intensity factors can be seen in the following figures. In all figures, the ratio Y_1/SCF is used as the vertical axis. Figure 54 shows the case where τ and a/c are small. The parameter τ is the ratio of the thickness of the brace to the thickness of the chord. In Figure 54, τ is only 0.2, i.e. the brace is comparatively thin. Each line in the figure represents a different γ value. It is seen that all lines are very close together. Therefore, γ has little effect on the ratio Y_1/SCF.

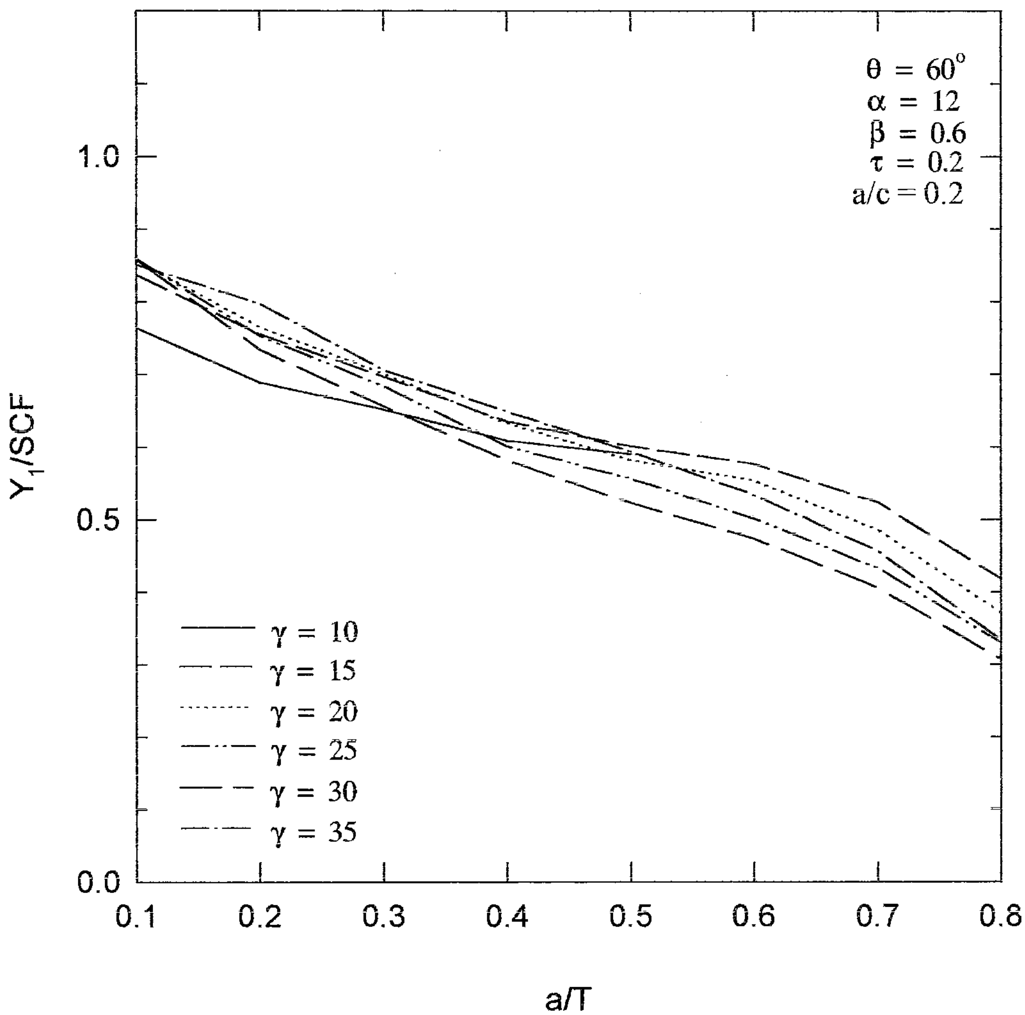


Figure 54. Effect of γ on SIF for β=0.6, τ=0.2 and a/c=0.2

Figure 55 shows results for joints with the same geometry as for Figure 54, except with cracks having a larger a/c ratio. A larger a/c results from cracks with a shorter length. The lines are even closer together than in Figure 54.

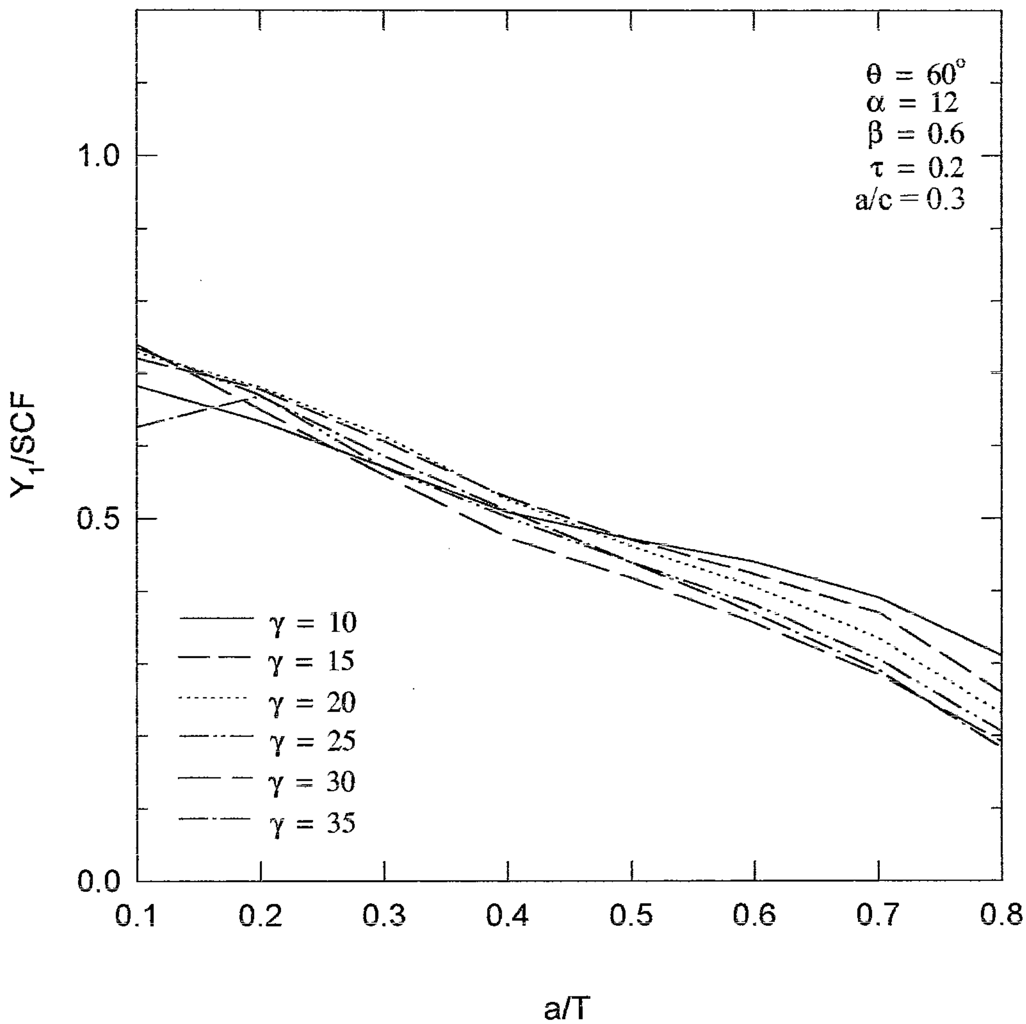


Figure 55. Effect of γ on SIF for β=0.6, τ=0.2 and a/c=0.3

When the length of crack is further reduced, as that shown in Figure 56, the lines remain very close together. Therefore, the effect of γ on the ratio Y_1/SCF is negligible for different a/c ratios.

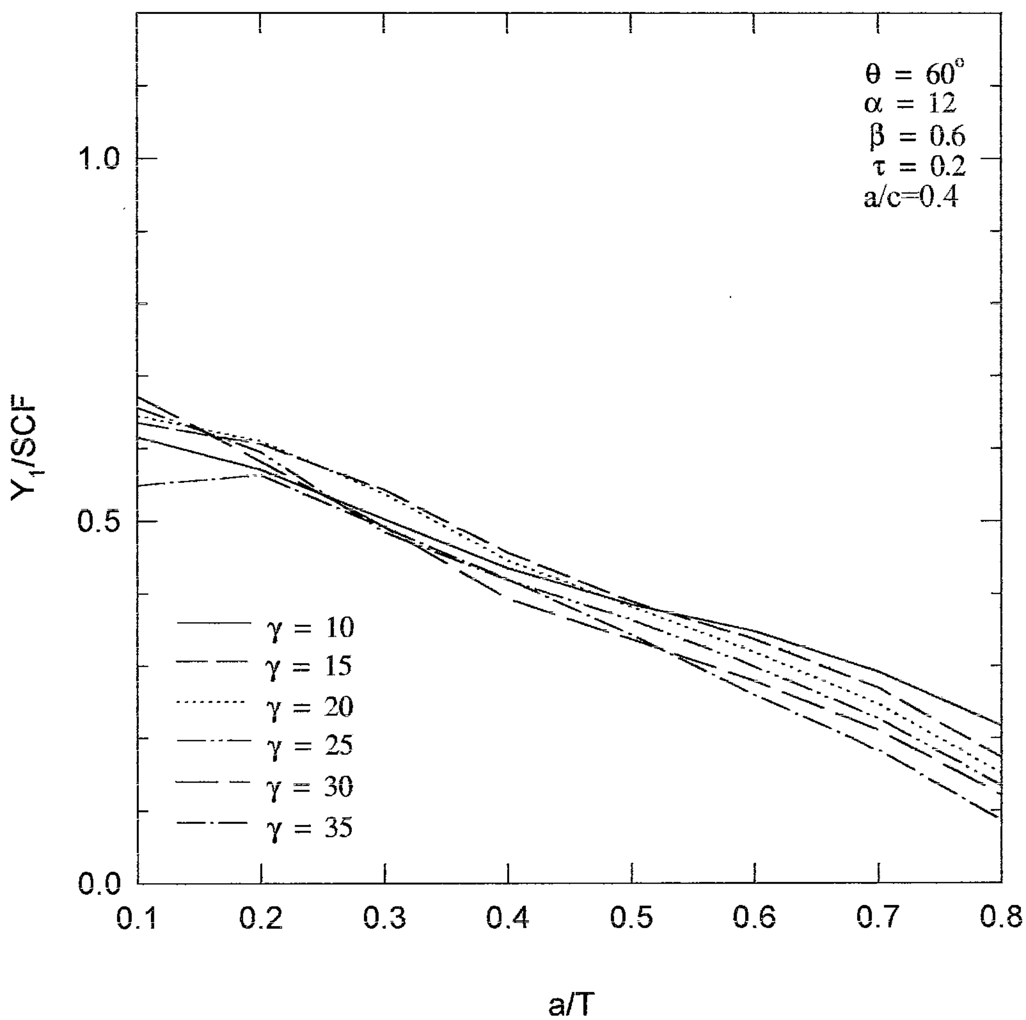


Figure 56. Effect of γ on SIF for β=0.6, τ=0.2 and a/c=0.4

In Figure 57, the parameters are the same as Figure 56 except that the value of τ has increased to 0.6. An increase in τ means an increase in the relative thickness of the brace. The lines are still very close together. This shows that the parameter γ has little effect on the ratio Y_1/SCF though the value of τ increases.

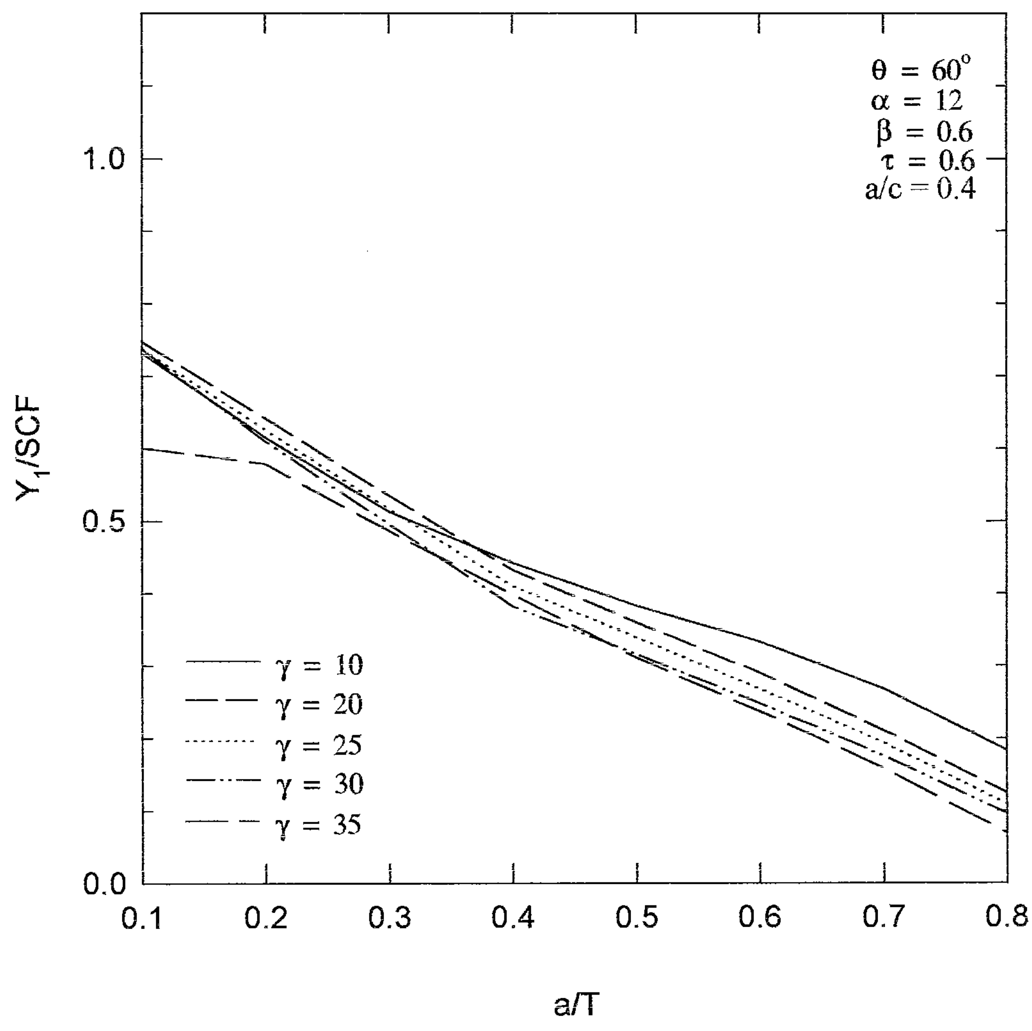


Figure 57. Effect of γ on SIF for β=0.6, τ=0.6 and a/c=0.4

In Figure 58, the parameter τ is further increased to 1.0. The lines are even closer together. Therefore, it is concluded that the parameter γ has negligible effect on the ratio Y_1/SCF within the range of τ studied.

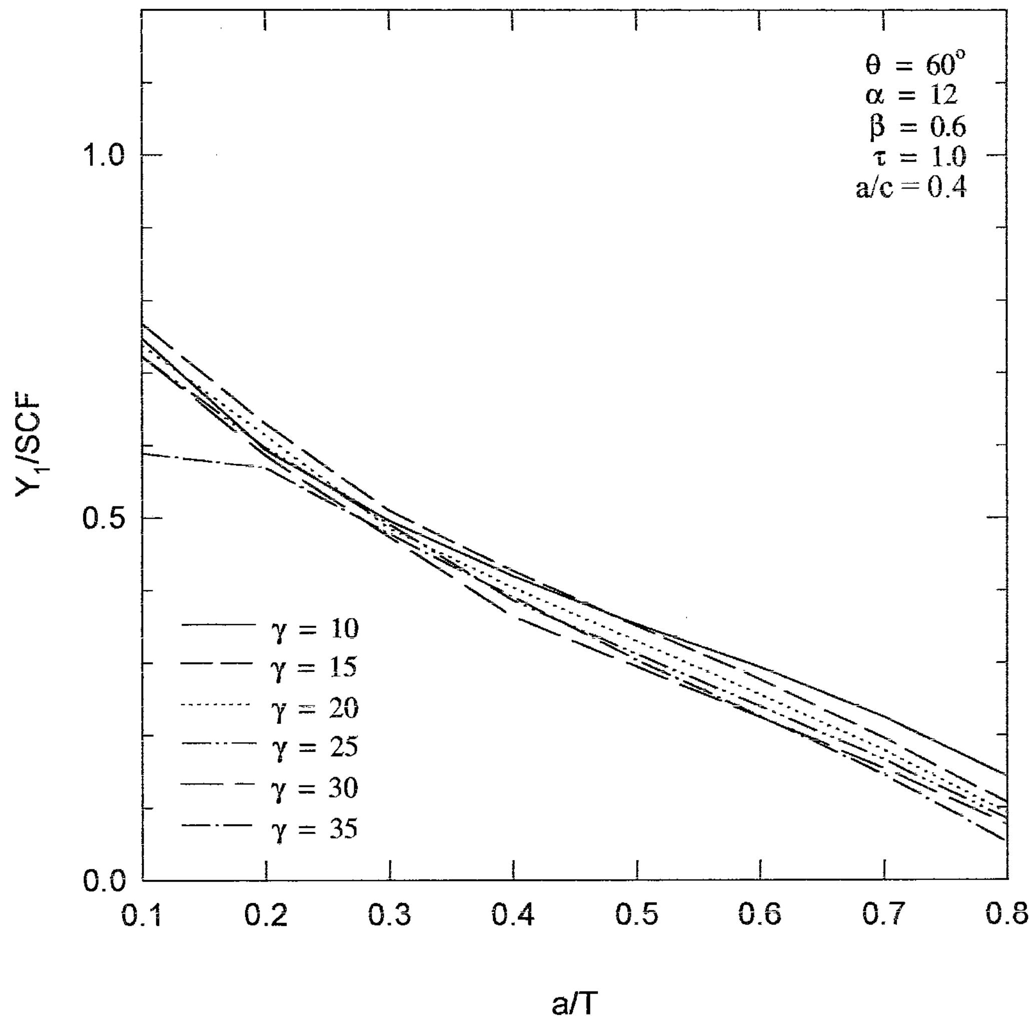


Figure 58. Effect of γ on SIF for β=0.6, τ=1.0 and a/c=0.4

Figure 59 shows results for joints having the same parameters as those in Figure 58 except the parameter β is changed to 0.8. Again, the lines are close together, even with different β values.

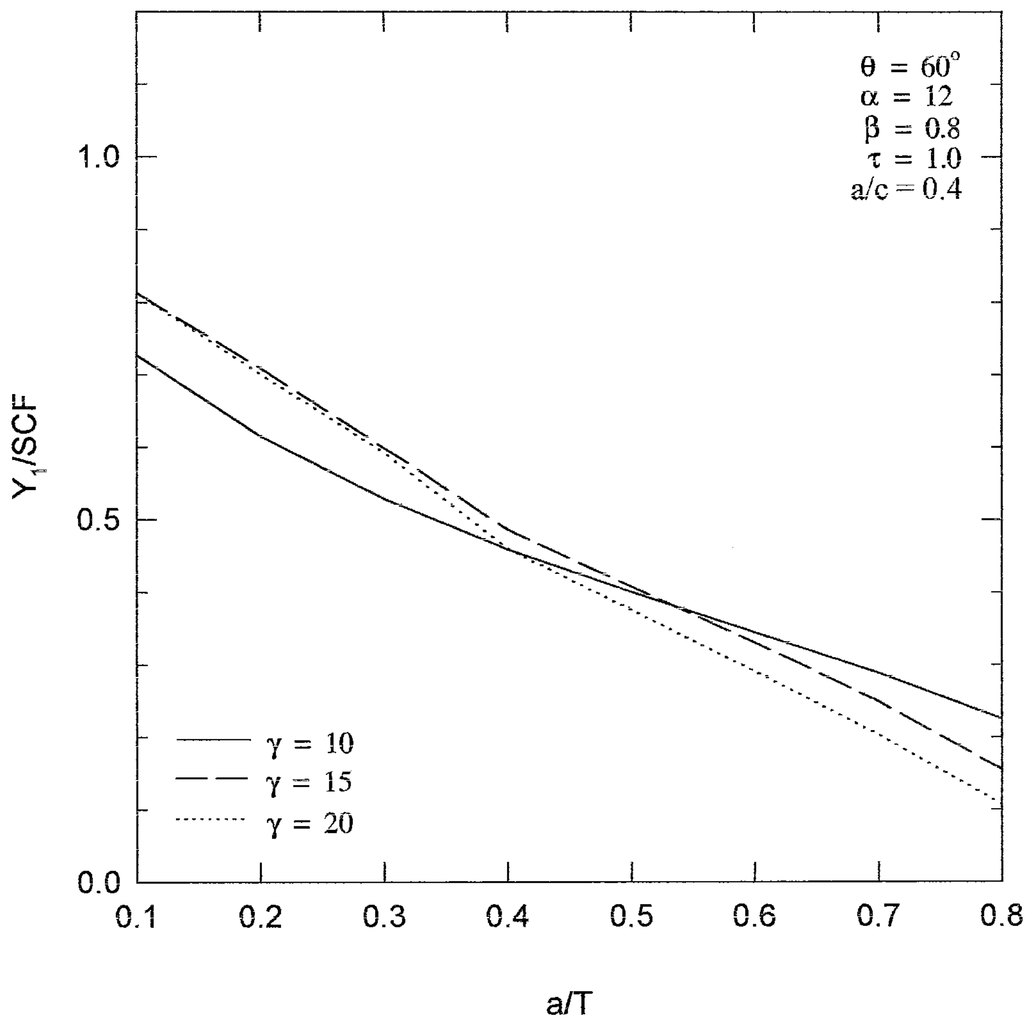


Figure 59. Effect of γ on SIF for β=0.8, τ=1.0 and a/c=0.4

As a conclusion, the parameter γ has negligible effect on the ratio Y_1/SCF for the range of β and τ studied.

Effect of τ on Stress Intensity Factors

The following figures show the effect of τ on the ratio Y_1/SCF. Figure 60 shows joints with small γ values. Each line represents a different τ ratio. The lines are very close together. This means that the ratio Y_1/SCF does not change significantly as the τ value changes.

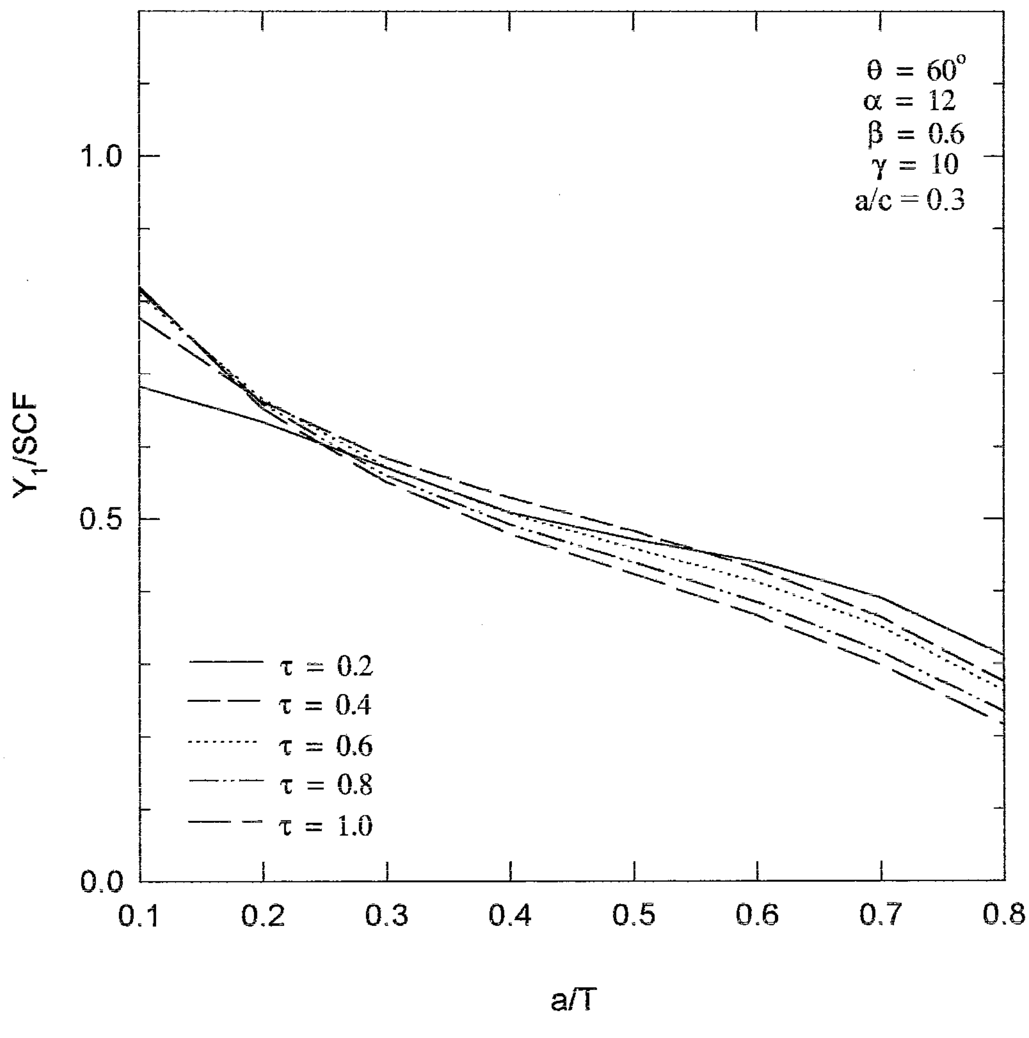


Figure 60. Effect of τ on SIF for β=0.6, γ=10 and a/c=0.3

Joints analyzed for Figure 61 have the same parametric values as joints for Figure 60, except γ has been increased to 20. The lines showing different τ values are still very close together.

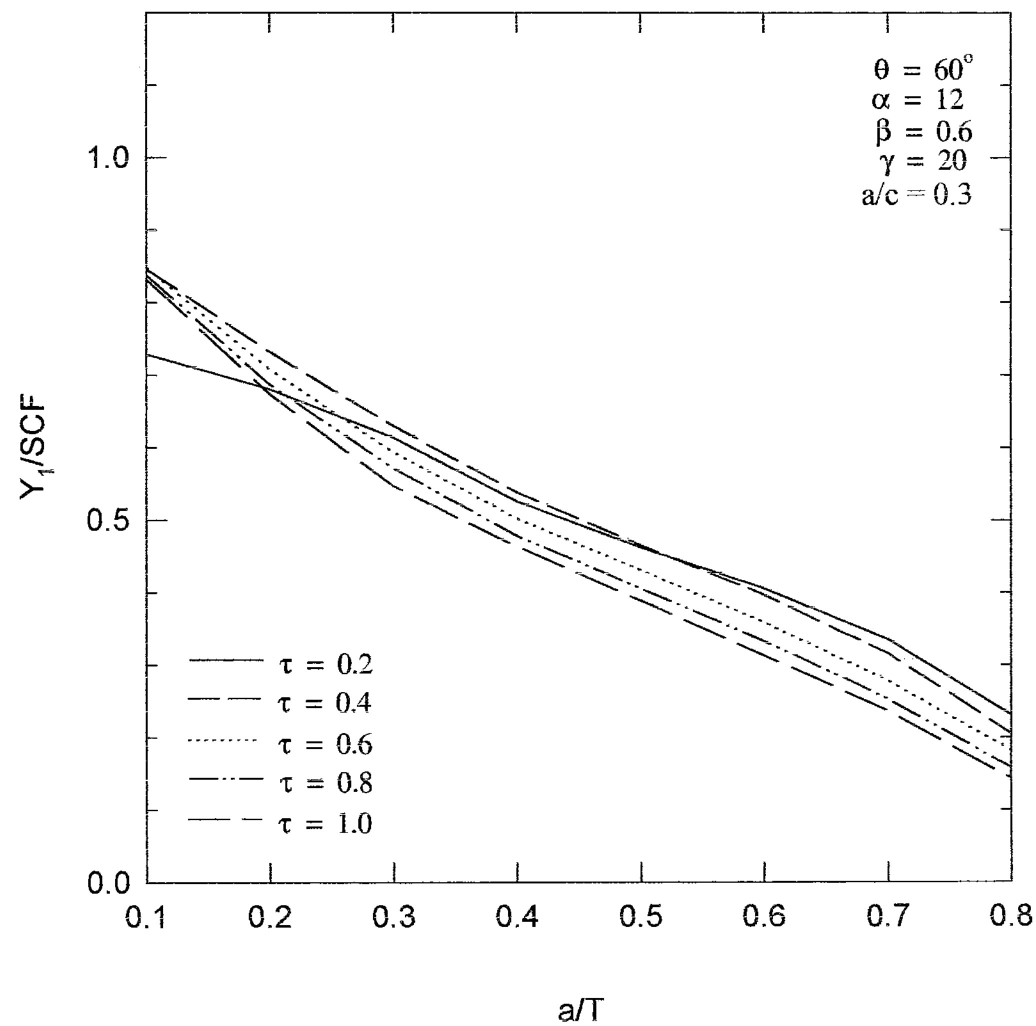


Figure 61. Effect of τ on SIF for β=0.6, γ=20 and a/c=0.3

Figure 62 shows results for joints with shorter crack lengths. The lines are even closer together with short cracks.

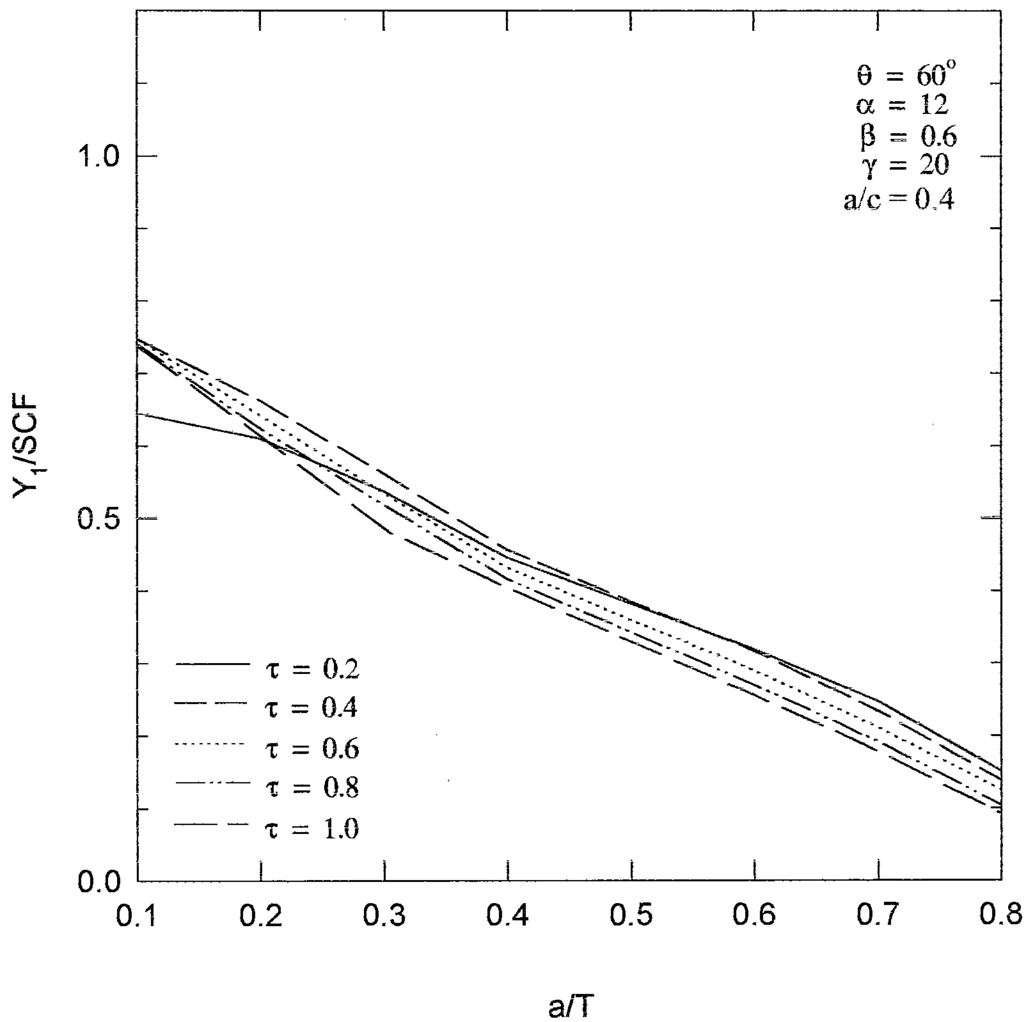


Figure 62. Effect of τ on SIF for β=0.6, γ=20 and a/c=0.4

The γ value of the joints analyzed for Figure 63 is further increased to 30. The closeness of the lines indicates that the parameter τ has an extremely small effect on the ratio Y_1/SCF when γ is large.

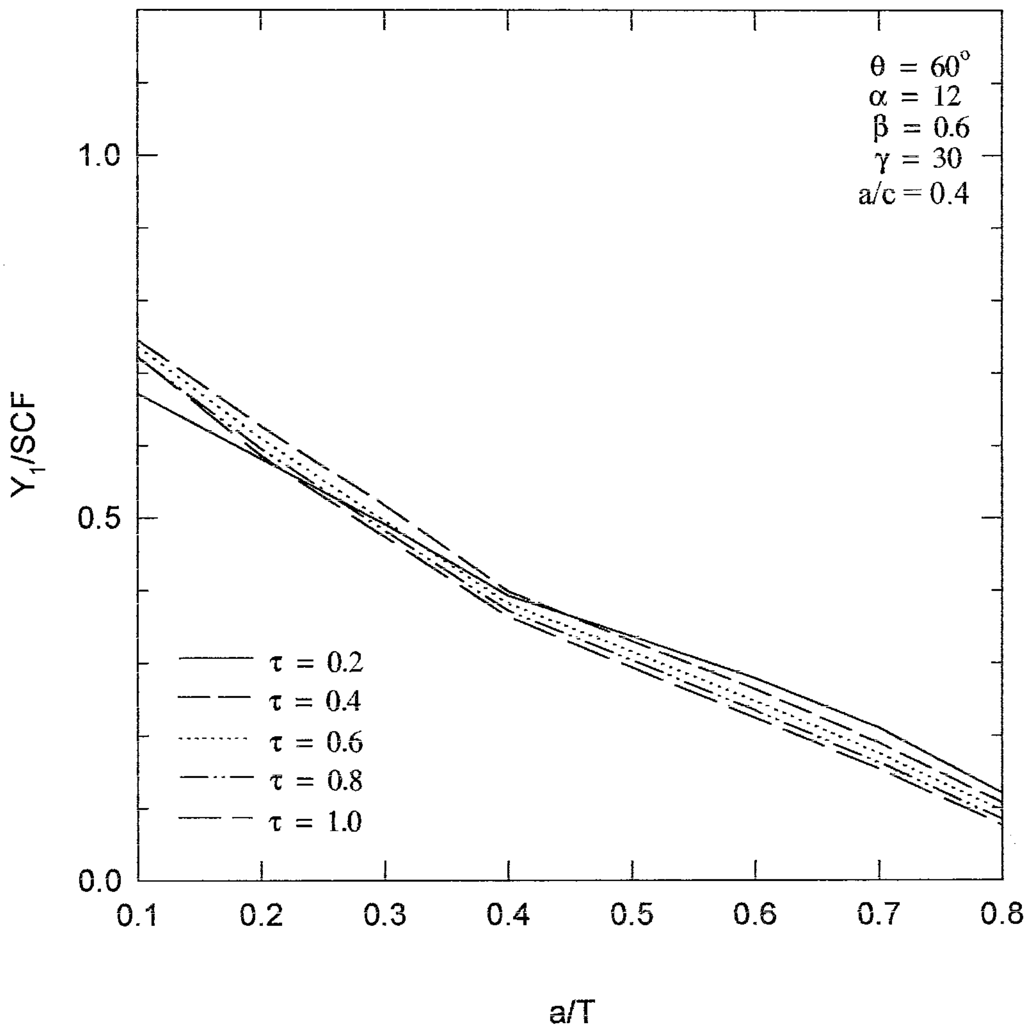


Figure 63. Effect of τ on SIF for β=0.6, γ=30 and a/c=0.4

Figure 64 shows results for joints with a β value of 0.8. Again the lines representing different τ values are very close together. Therefore the parameter τ has negligible effect on the ratio Y_1/SCF under different β values.

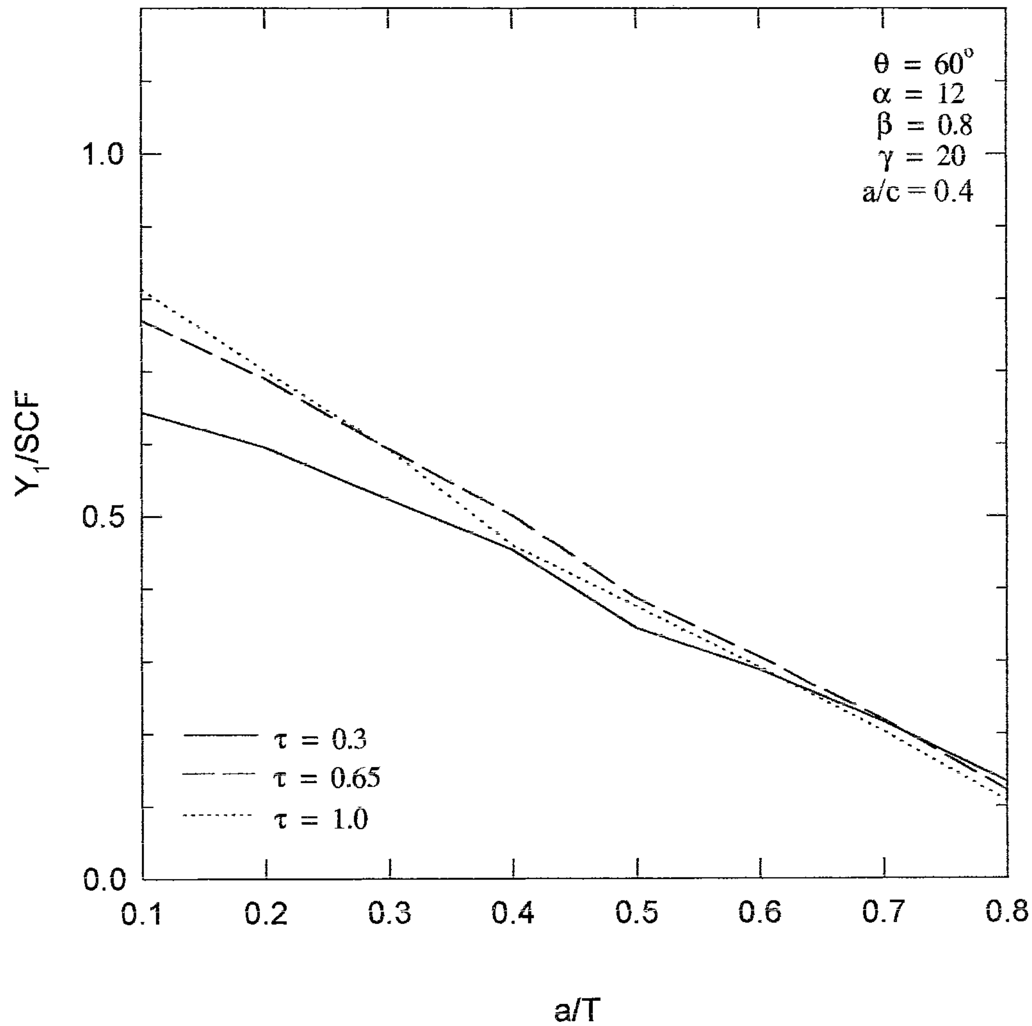


Figure 64. Effect of τ on SIF for β=0.8, γ=20 and a/c=0.4

As a whole, the parameters β, γ and τ have little effect on the ratio Y_1/SCF. Joints with different β, γ or τ values all have nearly the same values for Y_1/SCF ratios. The main factors that effect this ratio are the crack geometry, a/T and a/c. A simplified method will be developed incorporating these parameters.

Development of Simplified Method

It has been shown that the ratio Y_1/SCF is not sensitive to joint parameters β, γ and τ. The ratio is dependent on a/T and a/c. The following linear equation, varying with both a/T and a/c, is proposed for simplified calculation of Y_1/SCF.

$$\frac{Y_{1a}}{SCF} = A - B\left(\frac{a}{T}\right)$$

The constants A and B are found by curve fitting through all the data obtained by finite element analysis using least square method. The line is then shifted upward to cover most of the cases and to keep the maximum error close to that of PD6493. Values for these constants are shown in Table 10. Values for A and B were set so that the parametric equation will cover all but a few extreme cases.

Table 10

Constants A and B for New Simplified Method

a/c	A	B
0.1	1.22	0.69
0.2	1.07	0.84
0.3	0.96	0.83
0.4	0.87	0.81

Valid Range of Parameters:
$\theta=60^{o}$, β=0.6&0.8, γ=10 to 35, τ=0.2 to 1.0

Figure 65 shows a comparison between the proposed equation and finite element results for joints with a/c ratio of 0.1. All joints with a/c of 0.1 are included in the figure and each joint is represented by one symbol. The figure shows that the parametric equation obtained from curve fitting is conservative for most of the cases. Even the extreme cases on the unsafe side are not far from the curve.

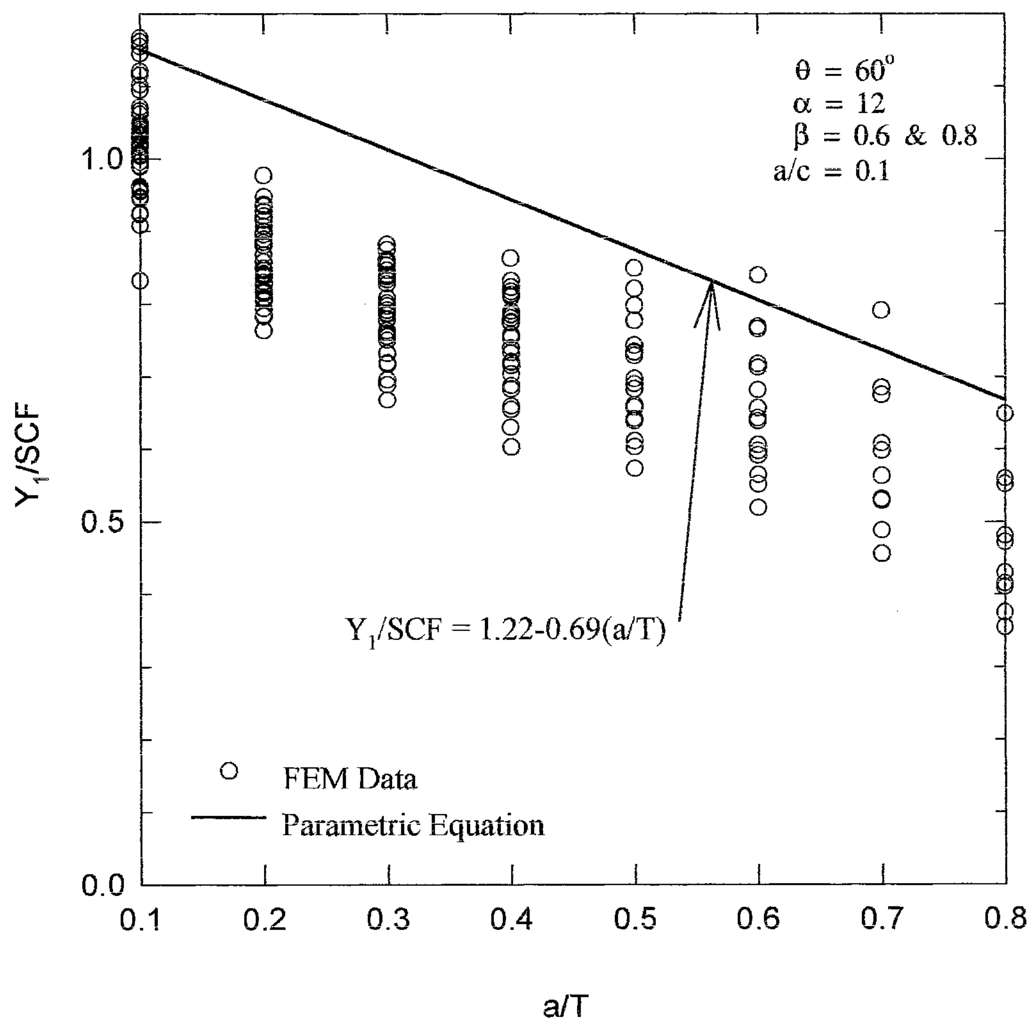


Figure 65. Curve Fitting for a/c=0.1

For joints with a/c of 0.2, the curve fitting results are shown in Figure 66. Again the parametric equation shown is conservative compared to most of the finite element results.

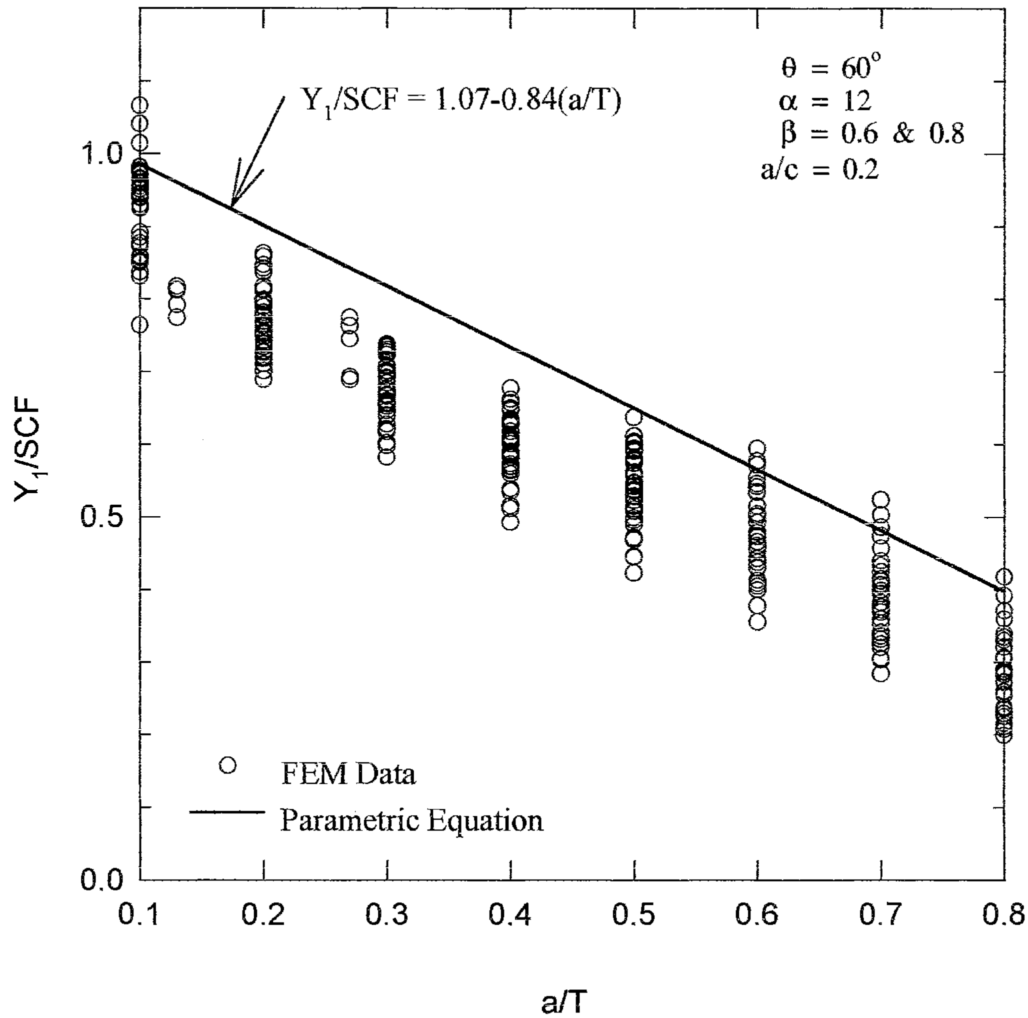


Figure 66. Curve Fitting for a/c=0.2

Joints with a/c of 0.3 are shown in Figure 67. The parametric equation proposed is on the safe side for all but a few extreme cases.

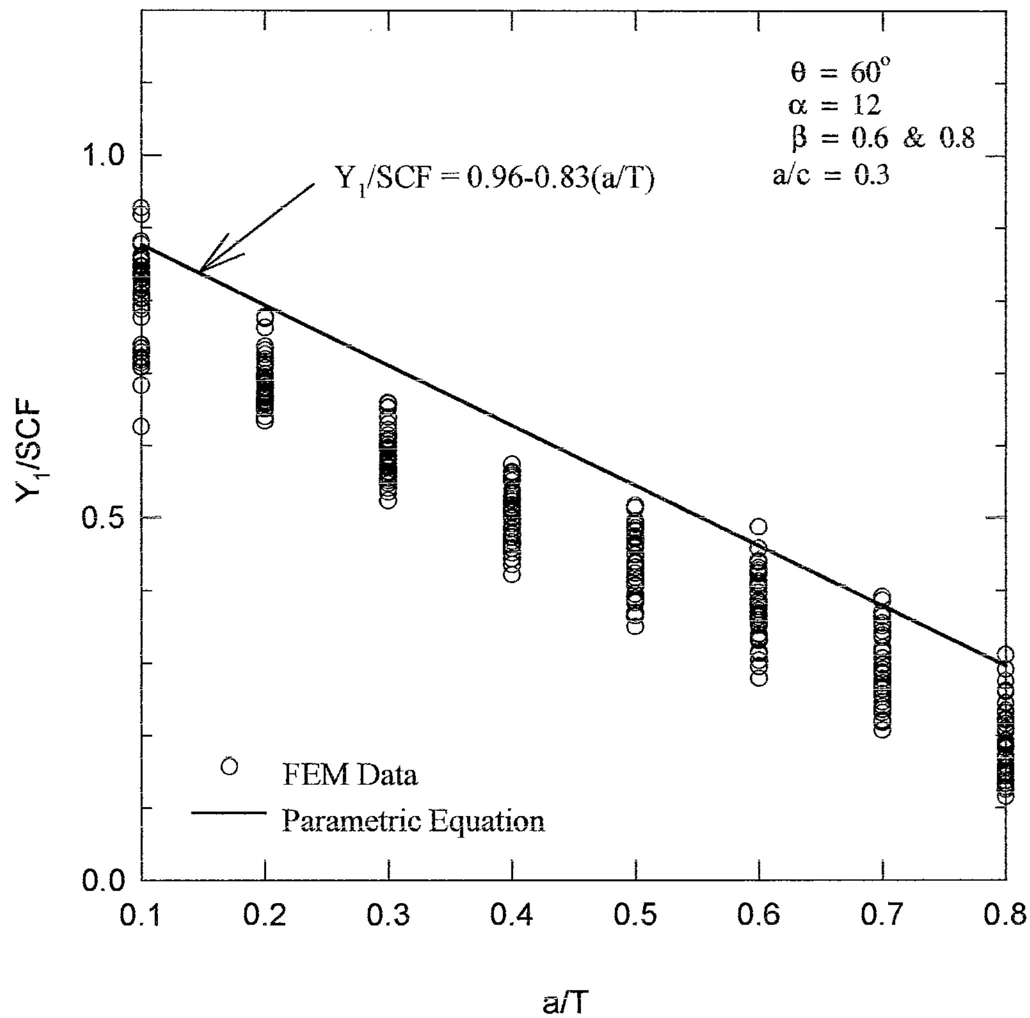


Figure 67. Curve Fitting for a/c=0.3

As shown in Figure 68, a similar parametric equation is obtained for joints with a/c of 0.4. Only a few cases are on the higher side of the parametric equation.

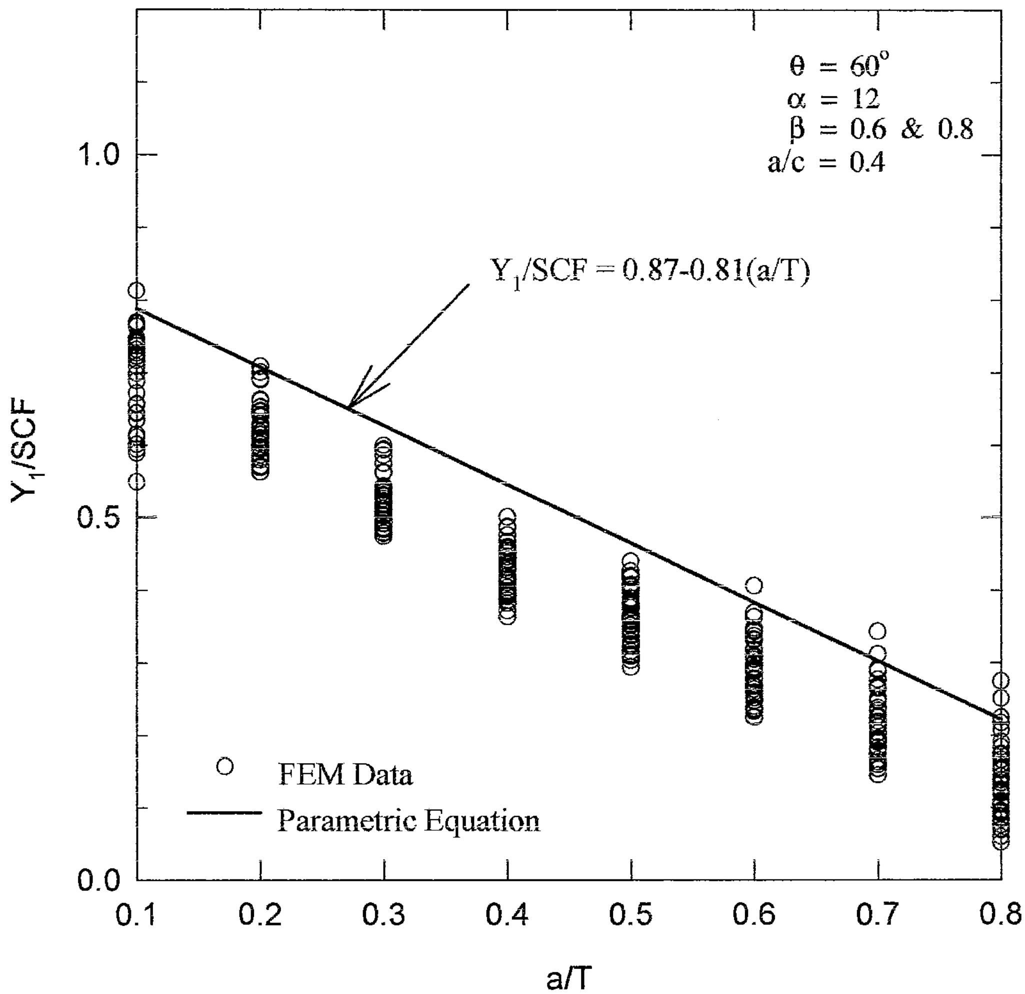


Figure 68. Curve Fitting for a/c=0.4

As shown in the above figures, the proposed method tends to produce stress intensity factors that are on safe side. Although some extreme cases are on the unsafe side, they do not fall far from the curve.

Comparison of Results with New Simplified Method

Stress intensity factors based on the proposed simplified method are compared with those obtained by finite element analysis. The comparison for joints with cracks having a/T of 0.2 is shown in Figure 69, and they are the same set of joints shown in Figures 48 and 50.

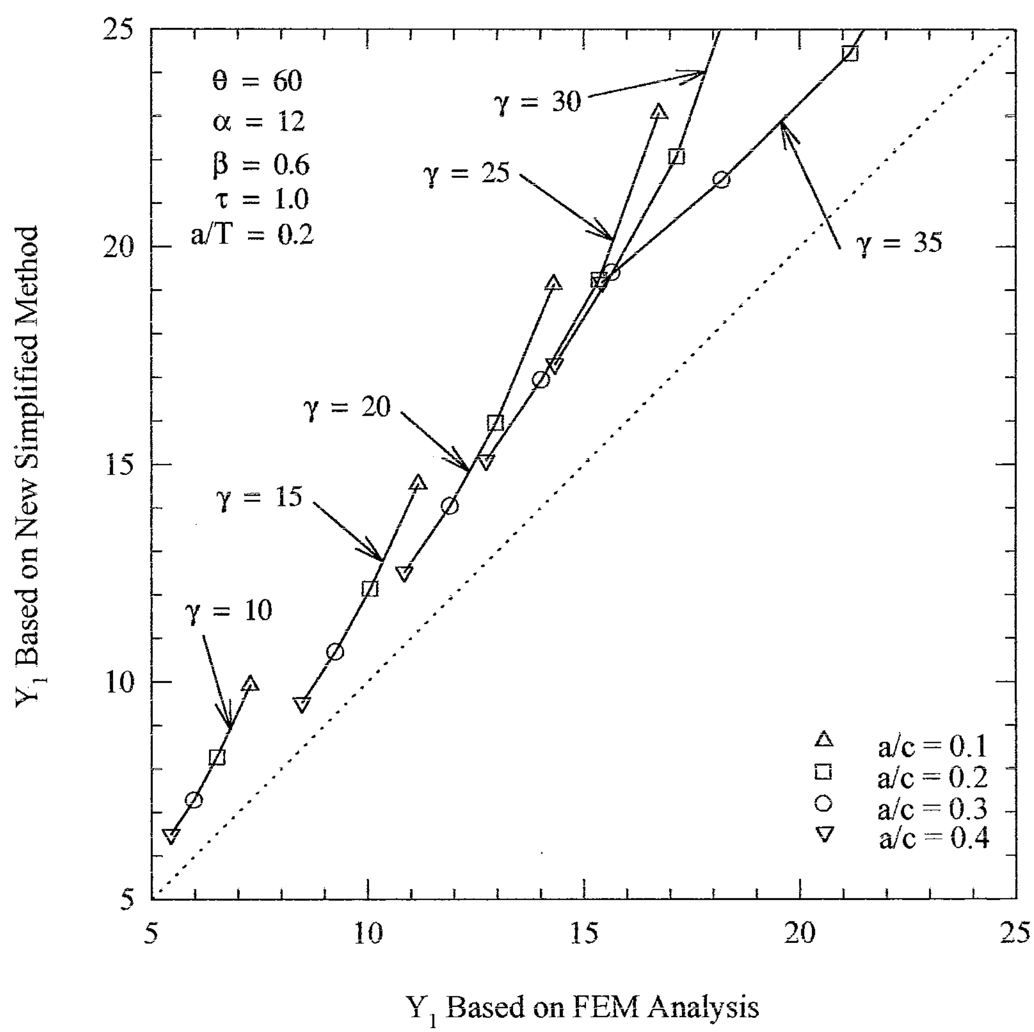


Figure 69. Comparison of SIF with New Simplified Method for a/T=0.2

For the joints shown in Figure 69, stress intensity based on the new method is higher than that proposed by PD6493. However, for deeper cracks, the new method produces stress intensity factors better than PD6493, as shown in Figure 70 which are the same set of joints as shown in Figures 49 and 51.

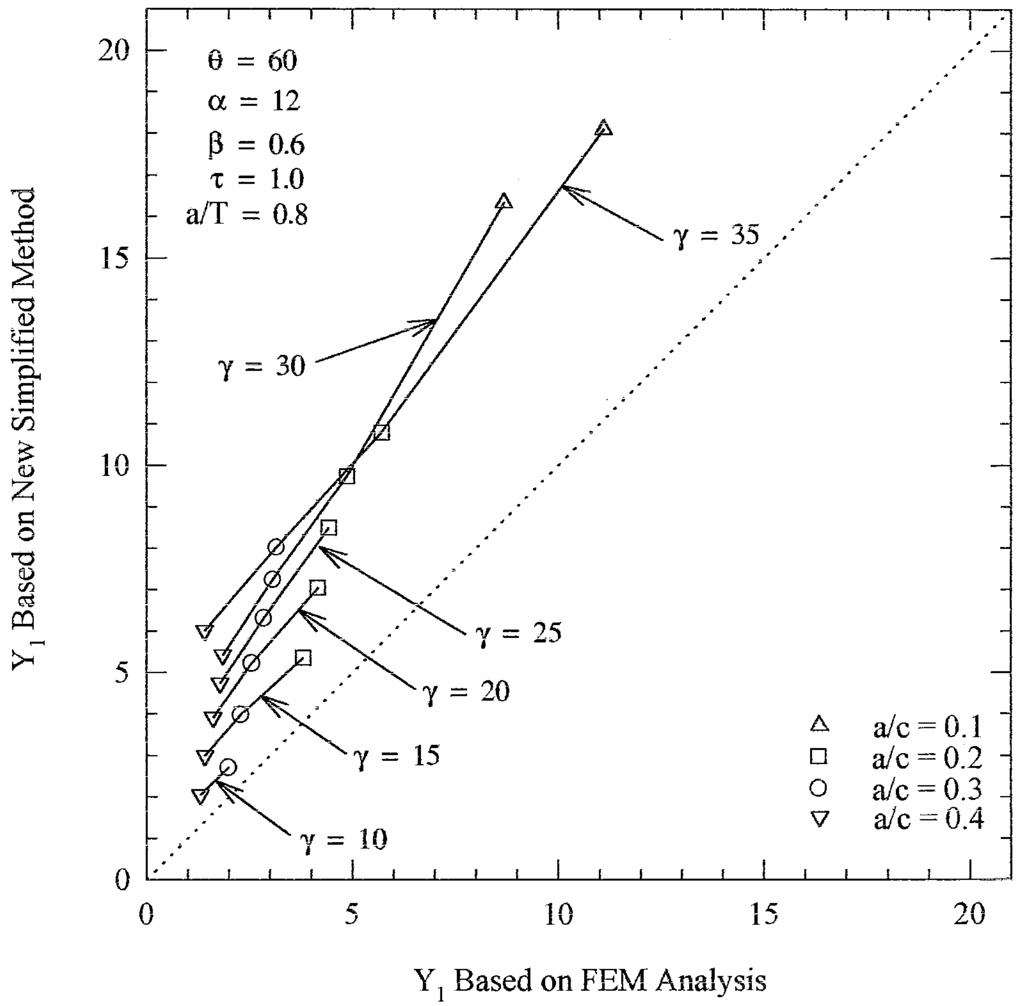


Figure 70. Comparison of SIF with New Simplified Method for a/T=0.8

The results obtained with the new method are also compared with the simplified methods proposed by Haswell and BSI PD6493. Tabulated results are provided in

Appendix E. It can be seen that results obtained by the new method are very close to that of BSI. The range of errors between the simplified methods and the finite element results are listed in Table 11.

Table 11

Comparison of Range of Errors Among Simplified Methods

a/c	Ho's Method	BSI PD6493	Modified PD6493	Haswell's Method
0.1	-7% to +88%	-11% to +111%	-41.2% to +13.3%	---
0.2	-8% to +100%	-3% to +111%	-34.5% to +24.8%	-7% to +215%
0.3	-5% to +155%	+3% to +149%	-25.5% to +68.7%	---
0.4	-19% to +327%	+7% to +304%	-20.3% to +209.8%	---

From the table, the maximum percentage of error produced by Ho's method and BSI PD6493 are very close. Haswell's method is only valid for a/c of 0.2, but its maximum error is double that for the other two methods.

For both the method proposed by Ho and the method from BSI PD6493, the high percentage errors shown in Table 11 are somewhat misleading. The high percentages occur when values of stress correction factors are small, mostly around 1.0. When stress correction factors are small, slight difference in numbers will lead to large percentages. The maximum error occurs when γ, τ, a/T and a/c are large. For joints with very thin chord, thick brace, deep and shallow crack, the error will be larger for both methods.

As a conclusion, Haswell's method is only accurate when γ is small. Methods proposed by Ho and BSI PD6493 have similar accuracy, but Ho's method is much simpler. However, it must be remembered that Ho's method is limited to Y-joints subject to brace axial tension with range of parameters shown in Table 8.

The simplified methods can be used to compute a first estimate of stress intensity factor and fatigue life. If fatigue life estimated on the basis of simplified methods is adequate, no further analysis is required. If fatigue life is inadequate, or if more detailed information is required, a more sophisticated form of analysis may be employed. This more sophisticated analysis may range up to a 3D finite element analysis of the tubular joint with the crack inserted and service loads applied.

CHAPTER VIII

CONCLUSIONS AND RECOMMENDATIONS

FOR FUTURE RESEARCH

Conclusions

In this research, work focuses on 60° Y-joints subjected to brace axial tension loads. The ratio of brace diameter to chord diameter, β, is 0.6 and 0.8. Conclusions based on the research are presented below.

Based on data obtained from finite element analyses, stress concentration factors are linearly proportional to τ, the ratio of brace thickness to chord thickness. The thicker the brace wall, the higher is the stress concentration on the chord wall. Parametric equations proposed both by Efthymiou and Smedley give acceptable estimations of stress concentration factors. Within the range of parameters studied, the degree of bending does not vary significantly, only from 0.72 to 0.87. The bending stress component dominates at the weld toe of the chord for all joints.

For the same joint parameters, Haswell's method produces stress intensity factors that are much higher than the stress intensity factors produced by the other approximate methods. The method proposed by BSI PD6493 produces results on the high side of the present finite element results, except for a few extreme cases. Generally, stress intensity factors computed using BSI PD6493 are 10 to 40% higher than the finite element results. For the method proposed by the UK Methodology Working Group, the bending stress component is modified by the linear moment release correction, (1-a/T). This method produces stress intensity factors that are closer to the finite element results, but many of the joints are on the unsafe side.

It is found that joint parameters have a negligible effect on the ratio of stress intensity factor to stress concentration factor; i.e., the ratio Y_1/SCF is not sensitive to β, γ and τ. The ratio is only affected by the crack parameters a/T and a/c. A new simplified method is proposed based on these properties. This method proves to have the same accuracy as BSI's method, but is much simpler to use.

Recommendations for Future Research

A simplified method for calculating the stress intensity factor in a tubular joint is a useful tool for assessing the fatigue life of the structure. The reliability of the method depends on the amount of data available to generate the method. Therefore, data generation is very important for refining the accuracy of simplified methods. The range of parameters included in the database should be expanded. Joints under combined loadings should also be analyzed.

In the current research, the crack surface is perpendicular to the surface of the chord wall. Some modification of the program is required so that it can model doubly curved cracks and give the user the control over the propagation profile of the crack. Then a more realistic crack profile can be modeled.

The long range objective is to provide a method for computing the service life of a tubular joint containing a defect. Fatigue life estimates depend on the crack growth model and material constants. This research only deals with computation of stress intensity factors. Since stress intensity factors cannot be measured directly in an experiment, they must be validated by comparing to other analytical results or by using the calculated stress intensity factors to estimate fatigue life. These fatigue life estimates are then compared to lives measured in laboratory fatigue tests. Assessment of fatigue life should be the next major research to follow.

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APPENDICES

APPENDIX A

PARAMETRIC EQUATIONS

1. Stress concentration factor on chord side for Y-joints subjected to brace tension by Kuang[38]:

$$SCF = 1.77\left(\frac{1}{2\gamma}\right)^{-0.808} e^{-1.2\beta^3} \tau^{1.333}\left(\frac{2}{\alpha}\right)\sin^{1.694}\theta$$

2. Stress concentration factor on chord saddle for Y-joints subjected to brace tension by Efthymiou[14]:

$$SCF = \gamma\tau^{1.1}\left[1.11 - 3(\beta - 0.52)^2\right]\sin^{1.6}\theta$$

3. Stress concentration factor on chord hot-spot for Y-joints subject to brace tension by Hellier[30]:

$$SCF = 9.92\alpha^{0.029}\tau^{1.3} \times \exp\left(-1.38\beta^{5.5} - 5.53\gamma^{-0.5} + 2.15\sin\theta - 0.0569\,\tau/\beta\right)$$

4. Stress concentration factor on chord saddle for Y-joints subjected to brace tension by Wordsworth and Smedley[71]:

$$SCF = \gamma\tau\beta\left(6.78 - 6.42\beta^{1/2}\right)\sin^{\left(1.7+0.7\beta^3\right)}\theta$$

5. Stress concentration factor on chord saddle for Y-joints subjected to brace tension by Smedley and Fisher[66] (Also known as Lloyd's Register's equation):

$$SCF = 1.20 * \tau\gamma^{1.2}\beta(2.12 - 2\beta)\sin^2\theta \qquad \text{for } \alpha \geq 12$$

6. Degree of bending on chord hot-spot for Y-joints subjected to brace tension by Connolly[7]:

$$DoB = 0.7026\alpha^{0.0236} \exp\left(-0.187\beta^4 + 0.0097\gamma + \frac{0.0047}{\theta^3} - \frac{21.7\beta^3}{\gamma^2} + 0.3038\beta\tau - \frac{0.0867\beta^2}{\theta^3} - \frac{\gamma^{1.5}\theta}{1000}\right)$$

where θ is in radians.

7. Location of hot-spot for Y-joints subjected to brace tension by Hellier[30]:

$$\phi_{hs} = 180 - 58.6\alpha^{0.0309}\beta^{0.0558}\tau^{\left(0.144\theta^2 - 0.404\right)} \times \exp\left(\frac{1.01}{\gamma} + \frac{0.343}{\sin\theta} - \frac{0.0503\beta}{\tau}\right)$$

where θ is in radians and ϕ_{hs} in degrees measured from the crown toe.

Table A1

Valid Range of Parameters

	θ	α	β	γ	τ
Kuang	0-90	6.67-40	0.3-0.8	8.33-33.3	0.2-0.8
Efthymiou	20-90	4-40	0.2-1.0	8-32	0.2-1.0
Hellier	35-90	6.21-13.1	0.2-0.8	7.6-32	0.2-1.0
Wordsworth	30-90	8-40	0.13-1.0	12-32	0.25-1.0
Smedley	30-90	>=4	0.13-1.0	10-35	0.25-1.0
Connolly	35-90	>=6.21	0.2-0.8	7.6-32	0.2-1.0

APPENDIX B

STRESS CONCENTRATION FACTORS BASED ON FINITE ELEMENT ANALYSIS

Table B1

SCF Analysis Results for β=0.4

θ	α	β	γ	τ	SCF	DoB	ϕ_{hs}
60	12	0.4	10	0.30	2.52	0.791	66.1
60	12	0.4	10	0.65	5.85	0.809	66.1
60	12	0.4	10	1.00	8.95	0.818	66.1
60	12	0.4	15	0.3	3.46	0.818	66.1
60	12	0.4	15	0.65	8.40	0.836	82.4
60	12	0.4	15	1.00	13.36	0.849	82.4
60	12	0.4	20	0.30	4.32	0.832	66.1
60	12	0.4	20	0.65	10.78	0.848	82.5
60	12	0.4	20	1.00	17.44	0.860	82.4

Table B2
SCF Analysis Results for β=0.6

θ	α	β	γ	τ	SCF	DoB	ϕ_{hs}
60	12	0.6	10	0.20	1.61	0.765	53.9
60	12	0.6	10	0.30	2.52	0.773	53.9
60	12	0.6	10	0.40	3.46	0.780	53.9
60	12	0.6	10	0.60	5.38	0.790	53.9
60	12	0.6	10	0.65	5.86	0.792	53.9
60	12	0.6	10	0.80	7.30	0.797	53.9
60	12	0.6	10	1.00	9.17	0.802	53.9
60	12	0.6	15	0.20	2.08	0.793	53.9
60	12	0.6	15	0.30	3.32	0.804	61.5
60	12	0.6	15	0.50	6.06	0.817	61.5
60	12	0.6	15	0.65	8.27	0.836	77.3
60	12	0.6	15	0.80	10.51	0.841	77.3
60	12	0.6	15	1.00	13.45	0.846	77.3
60	12	0.6	20	0.20	2.51	0.812	61.5
60	12	0.6	20	0.30	4.16	0.824	61.5
60	12	0.6	20	0.40	5.89	0.831	61.5
60	12	0.6	20	0.50	7.78	0.844	77.3
60	12	0.6	20	0.60	9.74	0.847	77.3
60	12	0.6	20	0.65	10.73	0.848	77.3
60	12	0.6	20	0.80	13.71	0.853	77.3
60	12	0.6	20	1.00	17.68	0.858	77.3
60	12	0.6	25	0.20	2.91	0.821	61.5
60	12	0.6	25	0.40	7.00	0.847	77.3
60	12	0.6	25	0.60	11.67	0.853	77.3
60	12	0.6	25	0.80	16.48	0.859	77.3
60	12	0.6	25	1.00	21.33	0.864	77.3
60	12	0.6	30	0.20	3.23	0.825	61.5
60	12	0.6	30	0.40	7.96	0.849	77.3
60	12	0.6	30	0.60	13.31	0.855	77.3
60	12	0.6	30	0.80	18.84	0.862	77.3
60	12	0.6	30	1.00	24.45	0.867	77.3
60	12	0.6	35	0.20	3.50	0.826	61.5
60	12	0.6	35	0.40	8.75	0.850	77.3
60	12	0.6	35	0.60	14.71	0.856	77.3
60	12	0.6	35	0.80	20.86	0.863	77.3
60	12	0.6	35	1.00	27.11	0.869	77.3

Table B3

SCF Analysis Results for β=0.8

θ	α	β	γ	τ	SCF	DoB	ϕ_{hs}
60	12	0.8	10	0.30	2.07	0.727	41.3
60	12	0.8	10	0.65	4.71	0.747	41.3
60	12	0.8	10	1.00	7.41	0.761	44.6
60	12	0.8	15	0.30	2.51	0.770	54.1
60	12	0.8	15	0.65	6.33	0.800	54.1
60	12	0.8	15	1.00	10.16	0.811	54.1
60	12	0.8	20	0.30	3.06	0.792	58.3
60	12	0.8	20	0.65	8.04	0.825	73.4
60	12	0.8	20	1.00	13.55	0.834	73.4

APPENDIX C

CRACK TIP COORDINATES USED BY HAN

Table C1

Crack Tip Coordinates used by Han

Joint	a	2c	x_1	y_1	z_1	x_2	y_2	z_2
S4	1.67	33.34	400.14	299.81	247.65	400.32	299.57	214.26
S1	1.67	11.00	400.07	299.91	236.45	400.13	299.93	225.45
S5	4.00	80.00	400.96	298.71	270.90	401.58	297.88	191.07
S2	4.00	26.40	400.12	299.84	244.15	400.26	299.65	217.76
S6	6.67	133.40	402.95	296.02	297.38	404.50	293.89	164.85
L4	6.67	66.70	400.66	299.12	264.27	401.15	298.46	197.67
S3	6.67	44.00	400.27	299.64	252.94	400.52	299.31	208.97
L1	6.67	33.34	400.14	299.81	247.62	400.32	299.57	214.29
L5	16.67	166.70	404.68	293.65	313.76	407.03	290.38	148.79
L2	16.67	83.34	401.07	298.57	272.56	401.74	297.66	189.42
L6	26.67	266.66	411.92	283.40	362.08	417.69	274.83	102.63
L3	26.67	133.30	402.95	296.02	297.33	404.50	293.90	164.90
YS10 to YS18	6.67	66.70	400.66	299.12	264.27	401.15	298.46	197.67
YS19 to YS27	6.67	66.70	309.80	392.46	269.75	301.36	398.89	203.92

APPENDIX D

STRESS INTENSITY FATORS ANALYSIS RESULTS

β	γ	τ	a/T	a/c	SCF	DoB	ϕ_{hs}	Y_{1a}	Y_{2a}	Y_{3a}	Y_{ea}
0.6	10.0	0.20	0.10	0.10	1.61	0.765	53.9	1.34	-0.17	-0.15	1.36
0.6	10.0	0.20	0.10	0.20	1.61	0.765	53.9	1.23	-0.16	-0.15	1.25
0.6	10.0	0.20	0.10	0.30	1.61	0.765	53.9	1.10	-0.18	-0.14	1.12
0.6	10.0	0.20	0.10	0.40	1.61	0.765	53.9	0.99	-0.19	-0.14	1.02
0.6	10.0	0.20	0.20	0.10	1.61	0.765	53.9	1.26	-0.12	-0.11	1.27
0.6	10.0	0.20	0.20	0.20	1.61	0.765	53.9	1.11	-0.12	-0.11	1.13
0.6	10.0	0.20	0.20	0.30	1.61	0.765	53.9	1.02	-0.10	-0.12	1.03
0.6	10.0	0.20	0.20	0.40	1.61	0.765	53.9	0.92	-0.09	-0.12	0.94
0.6	10.0	0.20	0.30	0.10	1.61	0.765	53.9	---	---	---	---
0.6	10.0	0.20	0.30	0.20	1.61	0.765	53.9	1.05	-0.14	-0.09	1.07
0.6	10.0	0.20	0.30	0.30	1.61	0.765	53.9	0.92	-0.13	-0.09	0.94
0.6	10.0	0.20	0.30	0.40	1.61	0.765	53.9	0.81	-0.12	-0.09	0.83
0.6	10.0	0.20	0.40	0.10	1.61	0.765	53.9	---	---	---	---
0.6	10.0	0.20	0.40	0.20	1.61	0.765	53.9	0.98	-0.16	-0.08	1.00
0.6	10.0	0.20	0.40	0.30	1.61	0.765	53.9	0.82	-0.15	-0.07	0.84
0.6	10.0	0.20	0.40	0.40	1.61	0.765	53.9	0.70	-0.14	-0.07	0.72
0.6	10.0	0.20	0.50	0.10	1.61	0.765	53.9	---	---	---	---
0.6	10.0	0.20	0.50	0.20	1.61	0.765	53.9	0.95	-0.15	-0.08	0.97
0.6	10.0	0.20	0.50	0.30	1.61	0.765	53.9	0.76	-0.14	-0.07	0.77
0.6	10.0	0.20	0.50	0.40	1.61	0.765	53.9	0.62	-0.13	-0.06	0.64
0.6	10.0	0.20	0.60	0.10	1.61	0.765	53.9	---	---	---	---
0.6	10.0	0.20	0.60	0.20	1.61	0.765	53.9	---	---	---	---
0.6	10.0	0.20	0.60	0.30	1.61	0.765	53.9	0.71	-0.14	-0.07	0.73
0.6	10.0	0.20	0.60	0.40	1.61	0.765	53.9	0.56	-0.13	-0.06	0.58
0.6	10.0	0.20	0.70	0.10	1.61	0.765	53.9	---	---	---	---

β	γ	τ	a/T	a/c	SCF	DoB	ϕ_{hs}	Y_{1a}	Y_{2a}	Y_{3a}	Y_{ea}
0.6	10.0	0.20	0.70	0.20	1.61	0.765	53.9	---	---	---	---
0.6	10.0	0.20	0.70	0.30	1.61	0.765	53.9	0.63	-0.16	-0.07	0.65
0.6	10.0	0.20	0.70	0.40	1.61	0.765	53.9	0.47	-0.14	-0.06	0.50
0.6	10.0	0.20	0.80	0.10	1.61	0.765	53.9	---	---	---	---
0.6	10.0	0.20	0.80	0.20	1.61	0.765	53.9	---	---	---	---
0.6	10.0	0.20	0.80	0.30	1.61	0.765	53.9	0.50	-0.19	-0.07	0.54
0.6	10.0	0.20	0.80	0.40	1.61	0.765	53.9	0.35	-0.17	-0.06	0.39
0.6	10.0	0.30	0.13	0.20	2.52	0.773	53.9	1.95	-0.28	-0.17	1.98
0.6	10.0	0.40	0.10	0.10	3.46	0.780	53.9	3.20	-0.57	-0.21	3.26
0.6	10.0	0.40	0.10	0.20	3.46	0.780	53.9	2.95	-0.54	-0.23	3.01
0.6	10.0	0.40	0.10	0.30	3.46	0.780	53.9	2.69	-0.56	-0.20	2.76
0.6	10.0	0.40	0.10	0.40	3.46	0.780	53.9	2.42	-0.58	-0.20	2.50
0.6	10.0	0.40	0.20	0.10	3.46	0.780	53.9	2.83	-0.44	-0.18	2.88
0.6	10.0	0.40	0.20	0.20	3.46	0.780	53.9	2.52	-0.40	-0.19	2.56
0.6	10.0	0.40	0.20	0.30	3.46	0.780	53.9	2.29	-0.37	-0.19	2.33
0.6	10.0	0.40	0.20	0.40	3.46	0.780	53.9	2.11	-0.36	-0.17	2.15
0.6	10.0	0.40	0.30	0.10	3.46	0.780	53.9	---	---	---	---
0.6	10.0	0.40	0.30	0.20	3.46	0.780	53.9	2.33	-0.39	-0.14	2.37
0.6	10.0	0.40	0.30	0.30	3.46	0.780	53.9	2.02	-0.34	-0.16	2.06
0.6	10.0	0.40	0.30	0.40	3.46	0.780	53.9	1.82	-0.30	-0.19	1.86
0.6	10.0	0.40	0.40	0.10	3.46	0.780	53.9	---	---	---	---
0.6	10.0	0.40	0.40	0.20	3.46	0.780	53.9	2.18	-0.35	-0.17	2.22
0.6	10.0	0.40	0.40	0.30	3.46	0.780	53.9	1.83	-0.32	-0.15	1.86
0.6	10.0	0.40	0.40	0.40	3.46	0.780	53.9	1.59	-0.29	-0.14	1.62
0.6	10.0	0.40	0.50	0.10	3.46	0.780	53.9	---	---	---	---
0.6	10.0	0.40	0.50	0.20	3.46	0.780	53.9	2.09	-0.31	-0.16	2.12
0.6	10.0	0.40	0.50	0.30	3.46	0.780	53.9	1.67	-0.28	-0.15	1.70
0.6	10.0	0.40	0.50	0.40	3.46	0.780	53.9	1.40	-0.25	-0.14	1.43
0.6	10.0	0.40	0.60	0.10	3.46	0.780	53.9	---	---	---	---
0.6	10.0	0.40	0.60	0.20	3.46	0.780	53.9	---	---	---	---
0.6	10.0	0.40	0.60	0.30	3.46	0.780	53.9	1.49	-0.30	-0.15	1.53
0.6	10.0	0.40	0.60	0.40	3.46	0.780	53.9	1.19	-0.27	-0.13	1.23
0.6	10.0	0.40	0.70	0.10	3.46	0.780	53.9	---	---	---	---
0.6	10.0	0.40	0.70	0.20	3.46	0.780	53.9	---	---	---	---
0.6	10.0	0.40	0.70	0.30	3.46	0.780	53.9	1.26	-0.33	-0.15	1.31

β	γ	τ	a/T	a/c	SCF	DoB	ϕ_{hs}	Y_{1a}	Y_{2a}	Y_{3a}	Y_{ea}
0.6	10.0	0.40	0.70	0.40	3.46	0.780	53.9	0.96	-0.29	-0.13	1.01
0.6	10.0	0.40	0.80	0.10	3.46	0.780	53.9	---	---	---	---
0.6	10.0	0.40	0.80	0.20	3.46	0.780	53.9	---	---	---	---
0.6	10.0	0.40	0.80	0.30	3.46	0.780	53.9	0.95	-0.38	-0.16	1.04
0.6	10.0	0.40	0.80	0.40	3.46	0.780	53.9	0.66	-0.33	-0.14	0.76
0.6	10.0	0.60	0.10	0.10	5.38	0.790	53.9	5.14	-1.08	-0.34	5.27
0.6	10.0	0.60	0.10	0.20	5.38	0.790	53.9	4.76	-1.05	-0.32	4.89
0.6	10.0	0.60	0.10	0.30	5.38	0.790	53.9	4.35	-1.07	-0.26	4.49
0.6	10.0	0.60	0.10	0.40	5.38	0.790	53.9	3.94	-1.10	-0.28	4.11
0.6	10.0	0.60	0.20	0.10	5.38	0.790	53.9	4.40	-0.78	-0.25	4.48
0.6	10.0	0.60	0.20	0.20	5.38	0.790	53.9	3.91	-0.72	-0.23	3.99
0.6	10.0	0.60	0.20	0.30	5.38	0.790	53.9	3.58	-0.67	-0.28	3.66
0.6	10.0	0.60	0.20	0.40	5.38	0.790	53.9	3.31	-0.64	-0.30	3.39
0.6	10.0	0.60	0.30	0.10	5.38	0.790	53.9	---	---	---	---
0.6	10.0	0.60	0.30	0.20	5.38	0.790	53.9	3.53	-0.64	-0.19	3.60
0.6	10.0	0.60	0.30	0.30	5.38	0.790	53.9	3.08	-0.57	-0.19	3.14
0.6	10.0	0.60	0.30	0.40	5.38	0.790	53.9	2.76	-0.53	-0.20	2.82
0.6	10.0	0.60	0.40	0.10	5.38	0.790	53.9	---	---	---	---
0.6	10.0	0.60	0.40	0.20	5.38	0.790	53.9	3.25	-0.55	-0.25	3.31
0.6	10.0	0.60	0.40	0.30	5.38	0.790	53.9	2.73	-0.48	-0.23	2.78
0.6	10.0	0.60	0.40	0.40	5.38	0.790	53.9	2.38	-0.45	-0.20	2.43
0.6	10.0	0.60	0.50	0.10	5.38	0.790	53.9	---	---	---	---
0.6	10.0	0.60	0.50	0.20	5.38	0.790	53.9	3.09	-0.52	-0.25	3.15
0.6	10.0	0.60	0.50	0.30	5.38	0.790	53.9	2.47	-0.45	-0.24	2.53
0.6	10.0	0.60	0.50	0.40	5.38	0.790	53.9	2.06	-0.40	-0.21	2.11
0.6	10.0	0.60	0.60	0.10	5.38	0.790	53.9	---	---	---	---
0.6	10.0	0.60	0.60	0.20	5.38	0.790	53.9	---	---	---	---
0.6	10.0	0.60	0.60	0.30	5.38	0.790	53.9	2.22	-0.44	-0.24	2.28
0.6	10.0	0.60	0.60	0.40	5.38	0.790	53.9	1.79	-0.39	-0.21	1.84
0.6	10.0	0.60	0.70	0.10	5.38	0.790	53.9	---	---	---	---
0.6	10.0	0.60	0.70	0.20	5.38	0.790	53.9	---	---	---	---
0.6	10.0	0.60	0.70	0.30	5.38	0.790	53.9	1.89	-0.45	-0.25	1.97
0.6	10.0	0.60	0.70	0.40	5.38	0.790	53.9	1.44	-0.40	-0.22	1.51
0.6	10.0	0.60	0.80	0.10	5.38	0.790	53.9	---	---	---	---
0.6	10.0	0.60	0.80	0.20	5.38	0.790	53.9	---	---	---	---

β	γ	τ	a/T	a/c	SCF	DoB	ϕ_{hs}	Y_{1a}	Y_{2a}	Y_{3a}	Y_{ea}
0.6	10.0	0.60	0.80	0.30	5.38	0.790	53.9	1.41	-0.52	-0.25	1.53
0.6	10.0	0.60	0.80	0.40	5.38	0.790	53.9	0.99	-0.44	-0.24	1.12
0.6	10.0	0.65	0.13	0.20	5.86	0.792	53.9	4.79	-0.97	-0.34	4.90
0.6	10.0	0.80	0.10	0.10	7.30	0.797	53.9	7.01	-1.54	-0.48	7.19
0.6	10.0	0.80	0.10	0.20	7.30	0.797	53.9	6.51	-1.51	-0.44	6.70
0.6	10.0	0.80	0.10	0.30	7.30	0.797	53.9	5.96	-1.59	-0.40	6.19
0.6	10.0	0.80	0.10	0.40	7.30	0.797	53.9	5.41	-1.59	-0.38	5.66
0.6	10.0	0.80	0.20	0.10	7.30	0.797	53.9	5.88	-1.07	-0.33	5.99
0.6	10.0	0.80	0.20	0.20	7.30	0.797	53.9	5.24	-0.97	-0.32	5.34
0.6	10.0	0.80	0.20	0.30	7.30	0.797	53.9	4.81	-0.92	-0.44	4.92
0.6	10.0	0.80	0.20	0.40	7.30	0.797	53.9	4.45	-0.89	-0.41	4.57
0.6	10.0	0.80	0.30	0.10	7.30	0.797	53.9	---	---	---	---
0.6	10.0	0.80	0.30	0.20	7.30	0.797	53.9	4.67	-0.84	-0.24	4.75
0.6	10.0	0.80	0.30	0.30	7.30	0.797	53.9	4.09	-0.75	-0.26	4.17
0.6	10.0	0.80	0.30	0.40	7.30	0.797	53.9	3.68	-0.69	-0.27	3.76
0.6	10.0	0.80	0.40	0.10	7.30	0.797	53.9	---	---	---	---
0.6	10.0	0.80	0.40	0.20	7.30	0.797	53.9	4.27	-0.72	-0.34	4.35
0.6	10.0	0.80	0.40	0.30	7.30	0.797	53.9	3.59	-0.62	-0.31	3.66
0.6	10.0	0.80	0.40	0.40	7.30	0.797	53.9	3.14	-0.58	-0.28	3.21
0.6	10.0	0.80	0.50	0.10	7.30	0.797	53.9	---	---	---	---
0.6	10.0	0.80	0.50	0.20	7.30	0.797	53.9	4.00	-0.68	-0.34	4.08
0.6	10.0	0.80	0.50	0.30	7.30	0.797	53.9	3.21	-0.58	-0.31	3.28
0.6	10.0	0.80	0.50	0.40	7.30	0.797	53.9	2.67	-0.51	-0.28	2.74
0.6	10.0	0.80	0.60	0.10	7.30	0.797	53.9	---	---	---	---
0.6	10.0	0.80	0.60	0.20	7.30	0.797	53.9	---	---	---	---
0.6	10.0	0.80	0.60	0.30	7.30	0.797	53.9	2.81	-0.57	-0.32	2.89
0.6	10.0	0.80	0.60	0.40	7.30	0.797	53.9	2.26	-0.50	-0.29	2.34
0.6	10.0	0.80	0.70	0.10	7.30	0.797	53.9	---	---	---	---
0.6	10.0	0.80	0.70	0.20	7.30	0.797	53.9	---	---	---	---
0.6	10.0	0.80	0.70	0.30	7.30	0.797	53.9	2.31	-0.57	-0.33	2.41
0.6	10.0	0.80	0.70	0.40	7.30	0.797	53.9	1.74	-0.49	-0.29	1.85
0.6	10.0	0.80	0.80	0.10	7.30	0.797	53.9	---	---	---	---
0.6	10.0	0.80	0.80	0.20	7.30	0.797	53.9	---	---	---	---
0.6	10.0	0.80	0.80	0.30	7.30	0.797	53.9	1.71	-0.61	-0.35	1.87
0.6	10.0	0.80	0.80	0.40	7.30	0.797	53.9	1.16	-0.52	-0.32	1.33

β	γ	τ	a/T	a/c	SCF	DoB	ϕ_{hs}	Y_{1a}	Y_{2a}	Y_{3a}	Y_{ea}
0.6	10.0	1.00	0.10	0.10	9.17	0.802	53.9	8.78	-1.89	-0.63	9.01
0.6	10.0	1.00	0.10	0.20	9.17	0.802	53.9	8.18	-1.87	-0.59	8.42
0.6	10.0	1.00	0.10	0.30	9.17	0.802	53.9	7.52	-1.96	-0.53	7.80
0.6	10.0	1.00	0.10	0.40	9.17	0.802	53.9	6.86	-1.97	-0.50	7.16
0.6	10.0	1.00	0.13	0.20	9.17	0.802	53.9	7.45	-1.51	-0.57	7.63
0.6	10.0	1.00	0.20	0.10	9.17	0.802	53.9	7.28	-1.31	-0.42	7.41
0.6	10.0	1.00	0.20	0.20	9.17	0.802	53.9	6.51	-1.18	-0.42	6.63
0.6	10.0	1.00	0.20	0.30	9.17	0.802	53.9	5.98	-1.11	-0.49	6.11
0.6	10.0	1.00	0.20	0.40	9.17	0.802	53.9	5.45	-1.08	-0.52	5.68
0.6	10.0	1.00	0.30	0.10	9.17	0.802	53.9	---	---	---	---
0.6	10.0	1.00	0.30	0.20	9.17	0.802	53.9	5.75	-1.02	-0.30	5.85
0.6	10.0	1.00	0.30	0.30	9.17	0.802	53.9	5.05	-0.89	-0.33	5.15
0.6	10.0	1.00	0.30	0.40	9.17	0.802	53.9	4.55	-0.83	-0.34	4.65
0.6	10.0	1.00	0.40	0.10	9.17	0.802	53.9	---	---	---	---
0.6	10.0	1.00	0.40	0.20	9.17	0.802	53.9	5.22	-0.83	-0.41	5.31
0.6	10.0	1.00	0.40	0.30	9.17	0.802	53.9	4.39	-0.74	-0.40	4.48
0.6	10.0	1.00	0.40	0.40	9.17	0.802	53.9	3.85	-0.69	-0.35	3.94
0.6	10.0	1.00	0.50	0.10	9.17	0.802	53.9	---	---	---	---
0.6	10.0	1.00	0.50	0.20	9.17	0.802	53.9	4.85	-0.82	-0.41	4.94
0.6	10.0	1.00	0.50	0.30	9.17	0.802	53.9	3.89	-0.70	-0.39	3.98
0.6	10.0	1.00	0.50	0.40	9.17	0.802	53.9	3.24	-0.61	-0.35	3.32
0.6	10.0	1.00	0.60	0.10	9.17	0.802	53.9	---	---	---	---
0.6	10.0	1.00	0.60	0.20	9.17	0.802	53.9	---	---	---	---
0.6	10.0	1.00	0.60	0.30	9.17	0.802	53.9	3.36	-0.67	-0.39	3.46
0.6	10.0	1.00	0.60	0.40	9.17	0.802	53.9	2.70	-0.59	-0.35	2.80
0.6	10.0	1.00	0.70	0.10	9.17	0.802	53.9	---	---	---	---
0.6	10.0	1.00	0.70	0.20	9.17	0.802	53.9	---	---	---	---
0.6	10.0	1.00	0.70	0.30	9.17	0.802	53.9	2.73	-0.66	-0.40	2.85
0.6	10.0	1.00	0.70	0.40	9.17	0.802	53.9	2.06	-0.57	-0.35	2.18
0.6	10.0	1.00	0.80	0.10	9.17	0.802	53.9	---	---	---	---
0.6	10.0	1.00	0.80	0.20	9.17	0.802	53.9	---	---	---	---
0.6	10.0	1.00	0.80	0.30	9.17	0.802	53.9	1.98	-0.69	-0.42	2.15
0.6	10.0	1.00	0.80	0.40	9.17	0.802	53.9	1.31	-0.58	-0.38	1.51
0.6	15.0	0.20	0.10	0.10	2.08	0.819	53.9	1.92	-0.24	-0.14	1.95

β	γ	τ	a/T	a/c	SCF	DoB	ϕ_{hs}	Y_{1a}	Y_{2a}	Y_{3a}	Y_{ea}
0.6	15.0	0.20	0.10	0.20	2.08	0.819	53.9	1.74	-0.23	-0.16	1.76
0.6	15.0	0.20	0.10	0.30	2.08	0.819	53.9	1.50	-0.27	-0.14	1.53
0.6	15.0	0.20	0.10	0.40	2.08	0.819	53.9	1.32	-0.27	-0.13	1.35
0.6	15.0	0.20	0.20	0.10	2.08	0.819	53.9	1.76	-0.13	-0.10	1.76
0.6	15.0	0.20	0.20	0.20	2.08	0.819	53.9	1.57	-0.10	-0.12	1.58
0.6	15.0	0.20	0.20	0.30	2.08	0.819	53.9	1.41	-0.09	-0.12	1.42
0.6	15.0	0.20	0.20	0.40	2.08	0.819	53.9	1.26	-0.09	-0.11	1.27
0.6	15.0	0.20	0.30	0.10	2.08	0.819	53.9	1.72	-0.08	-0.08	1.72
0.6	15.0	0.20	0.30	0.20	2.08	0.819	53.9	1.45	-0.10	-0.08	1.46
0.6	15.0	0.20	0.30	0.30	2.08	0.819	53.9	1.26	-0.09	-0.10	1.27
0.6	15.0	0.20	0.30	0.40	2.08	0.819	53.9	1.13	-0.08	-0.09	1.14
0.6	15.0	0.20	0.40	0.10	2.08	0.819	53.9	1.69	-0.09	-0.08	1.70
0.6	15.0	0.20	0.40	0.20	2.08	0.819	53.9	1.32	-0.12	-0.07	1.33
0.6	15.0	0.20	0.40	0.30	2.08	0.819	53.9	1.10	-0.11	-0.07	1.11
0.6	15.0	0.20	0.40	0.40	2.08	0.819	53.9	0.95	-0.10	-0.06	0.96
0.6	15.0	0.20	0.50	0.10	2.08	0.819	53.9	---	---	---	---
0.6	15.0	0.20	0.50	0.20	2.08	0.819	53.9	1.25	-0.11	-0.07	1.26
0.6	15.0	0.20	0.50	0.30	2.08	0.819	53.9	0.98	-0.11	-0.06	0.99
0.6	15.0	0.20	0.50	0.40	2.08	0.819	53.9	0.81	-0.10	-0.06	0.82
0.6	15.0	0.20	0.60	0.10	2.08	0.819	53.9	---	---	---	---
0.6	15.0	0.20	0.60	0.20	2.08	0.819	53.9	1.20	-0.11	-0.07	1.21
0.6	15.0	0.20	0.60	0.30	2.08	0.819	53.9	0.88	-0.11	-0.06	0.89
0.6	15.0	0.20	0.60	0.40	2.08	0.819	53.9	0.70	-0.10	-0.06	0.71
0.6	15.0	0.20	0.70	0.10	2.08	0.819	53.9	---	---	---	---
0.6	15.0	0.20	0.70	0.20	2.08	0.819	53.9	1.09	-0.14	-0.07	1.10
0.6	15.0	0.20	0.70	0.30	2.08	0.819	53.9	0.77	-0.13	-0.07	0.78
0.6	15.0	0.20	0.70	0.40	2.08	0.819	53.9	0.56	-0.12	-0.06	0.57
0.6	15.0	0.20	0.80	0.10	2.08	0.819	53.9	---	---	---	---
0.6	15.0	0.20	0.80	0.20	2.08	0.819	53.9	0.87	-0.20	-0.08	0.90
0.6	15.0	0.20	0.80	0.30	2.08	0.819	53.9	0.54	-0.16	-0.07	0.57
0.6	15.0	0.20	0.80	0.40	2.08	0.819	53.9	0.36	-0.15	-0.07	0.40
0.6	15.0	0.30	0.10	0.10	3.32	0.804	61.5	3.34	-0.51	-0.16	3.38
0.6	15.0	0.30	0.10	0.20	3.32	0.804	61.5	3.07	-0.49	-0.18	3.11
0.6	15.0	0.30	0.10	0.30	3.32	0.804	61.5	2.67	-0.56	-0.16	2.74
0.6	15.0	0.30	0.10	0.40	3.32	0.804	61.5	2.38	-0.56	-0.15	2.45

β	γ	τ	a/T	a/c	SCF	DoB	ϕ_{bs}	Y_{1a}	Y_{2a}	Y_{3a}	Y_{ea}
0.6	15.0	0.30	0.20	0.10	3.32	0.804	61.5	2.95	-0.33	-0.11	2.97
0.6	15.0	0.30	0.20	0.20	3.32	0.804	61.5	2.64	-0.27	-0.14	2.66
0.6	15.0	0.30	0.20	0.30	3.32	0.804	61.5	2.39	-0.25	-0.14	2.41
0.6	15.0	0.30	0.20	0.40	3.32	0.804	61.5	2.15	-0.25	-0.14	2.17
0.6	15.0	0.30	0.30	0.10	3.32	0.804	61.5	2.86	-0.25	-0.11	2.87
0.6	15.0	0.30	0.30	0.20	3.32	0.804	61.5	2.41	-0.23	-0.12	2.42
0.6	15.0	0.30	0.30	0.30	3.32	0.804	61.5	2.12	-0.19	-0.14	2.14
0.6	15.0	0.30	0.30	0.40	3.32	0.804	61.5	1.91	-0.16	-0.14	1.92
0.6	15.0	0.30	0.40	0.10	3.32	0.804	61.5	2.61	-0.22	-0.10	2.62
0.6	15.0	0.30	0.40	0.20	3.32	0.804	61.5	2.18	-0.22	-0.11	2.19
0.6	15.0	0.30	0.40	0.30	3.32	0.804	61.5	1.83	-0.19	-0.11	1.85
0.6	15.0	0.30	0.40	0.40	3.32	0.804	61.5	1.58	-0.16	-0.09	1.59
0.6	15.0	0.30	0.50	0.10	3.32	0.804	61.5	---	---	---	---
0.6	15.0	0.30	0.50	0.20	3.32	0.804	61.5	2.03	-0.17	-0.12	2.04
0.6	15.0	0.30	0.50	0.30	3.32	0.804	61.5	1.63	-0.15	-0.11	1.65
0.6	15.0	0.30	0.50	0.40	3.32	0.804	61.5	1.35	-0.14	-0.10	1.36
0.6	15.0	0.30	0.60	0.10	3.32	0.804	61.5	---	---	---	---
0.6	15.0	0.30	0.60	0.20	3.32	0.804	61.5	1.90	-0.20	-0.11	1.91
0.6	15.0	0.30	0.60	0.30	3.32	0.804	61.5	1.42	-0.18	-0.11	1.43
0.6	15.0	0.30	0.60	0.40	3.32	0.804	61.5	1.14	-0.16	-0.10	1.16
0.6	15.0	0.30	0.70	0.10	3.32	0.804	61.5	---	---	---	---
0.6	15.0	0.30	0.70	0.20	3.32	0.804	61.5	1.67	-0.25	-0.12	1.69
0.6	15.0	0.30	0.70	0.30	3.32	0.804	61.5	1.18	-0.21	-0.11	1.21
0.6	15.0	0.30	0.70	0.40	3.32	0.804	61.5	0.88	-0.19	-0.11	0.91
0.6	15.0	0.30	0.80	0.10	3.32	0.804	61.5	---	---	---	---
0.6	15.0	0.30	0.80	0.20	3.32	0.804	61.5	1.30	-0.32	-0.13	1.35
0.6	15.0	0.30	0.80	0.30	3.32	0.804	61.5	0.81	-0.26	-0.12	0.87
0.6	15.0	0.30	0.80	0.40	3.32	0.804	61.5	0.55	-0.23	-0.11	0.61
0.6	15.0	0.50	0.10	0.10	6.06	0.817	61.5	6.36	-1.24	-0.18	6.48
0.6	15.0	0.50	0.10	0.20	6.06	0.817	61.5	5.91	-1.26	-0.22	6.05
0.6	15.0	0.50	0.10	0.30	6.06	0.817	61.5	5.21	-1.34	-0.19	5.38
0.6	15.0	0.50	0.10	0.40	6.06	0.817	61.5	4.63	-1.31	-0.20	4.82
0.6	15.0	0.50	0.20	0.10	6.06	0.817	61.5	5.39	-0.78	-0.16	5.45
0.6	15.0	0.50	0.20	0.20	6.06	0.817	61.5	4.83	-0.70	-0.20	4.89
0.6	15.0	0.50	0.20	0.30	6.06	0.817	61.5	4.40	-0.68	-0.23	4.46
0.6	15.0	0.50	0.20	0.40	6.06	0.817	61.5	4.02	-0.66	-0.21	4.08

β	γ	τ	a/T	a/c	SCF	DoB	ϕ_{hs}	Y_{1a}	Y_{2a}	Y_{3a}	Y_{ea}
0.6	15.0	0.50	0.30	0.10	6.06	0.817	61.5	5.07	-0.61	-0.17	5.11
0.6	15.0	0.50	0.30	0.20	6.06	0.817	61.5	4.24	-0.53	-0.21	4.28
0.6	15.0	0.50	0.30	0.30	6.06	0.817	61.5	3.77	-0.47	-0.23	3.81
0.6	15.0	0.50	0.30	0.40	6.06	0.817	61.5	3.41	-0.44	-0.22	3.45
0.6	15.0	0.50	0.40	0.10	6.06	0.817	61.5	4.95	-0.53	-0.16	4.98
0.6	15.0	0.50	0.40	0.20	6.06	0.817	61.5	3.84	-0.43	-0.19	3.87
0.6	15.0	0.50	0.40	0.30	6.06	0.817	61.5	3.26	-0.37	-0.18	3.29
0.6	15.0	0.50	0.40	0.40	6.06	0.817	61.5	2.83	-0.33	-0.15	2.86
0.6	15.0	0.50	0.50	0.10	6.06	0.817	61.5	---	---	---	---
0.6	15.0	0.50	0.50	0.20	6.06	0.817	61.5	3.59	-0.35	-0.22	3.61
0.6	15.0	0.50	0.50	0.30	6.06	0.817	61.5	2.87	-0.31	-0.19	2.90
0.6	15.0	0.50	0.50	0.40	6.06	0.817	61.5	2.41	-0.27	-0.17	2.44
0.6	15.0	0.50	0.60	0.10	6.06	0.817	61.5	---	---	---	---
0.6	15.0	0.50	0.60	0.20	6.06	0.817	61.5	3.31	-0.34	-0.22	3.33
0.6	15.0	0.50	0.60	0.30	6.06	0.817	61.5	2.48	-0.30	-0.21	2.51
0.6	15.0	0.50	0.60	0.40	6.06	0.817	61.5	2.02	-0.26	-0.20	2.05
0.6	15.0	0.50	0.70	0.10	6.06	0.817	61.5	---	---	---	---
0.6	15.0	0.50	0.70	0.20	6.06	0.817	61.5	2.87	-0.38	-0.24	2.91
0.6	15.0	0.50	0.70	0.30	6.06	0.817	61.5	2.05	-0.32	-0.22	2.10
0.6	15.0	0.50	0.70	0.40	6.06	0.817	61.5	1.53	-0.27	-0.22	1.58
0.6	15.0	0.50	0.80	0.10	6.06	0.817	61.5	---	---	---	---
0.6	15.0	0.50	0.80	0.20	6.06	0.817	61.5	2.18	-0.51	-0.25	2.26
0.6	15.0	0.50	0.80	0.30	6.06	0.817	61.5	1.35	-0.40	-0.24	1.44
0.6	15.0	0.50	0.80	0.40	6.06	0.817	61.5	0.93	-0.35	-0.23	1.03
0.6	15.0	0.65	0.10	0.10	8.27	0.836	77.3	8.61	-1.85	-0.25	8.81
0.6	15.0	0.65	0.10	0.20	8.27	0.836	77.3	8.03	-1.85	-0.27	8.25
0.6	15.0	0.65	0.10	0.30	8.27	0.836	77.3	7.13	-1.97	-0.24	7.40
0.6	15.0	0.65	0.10	0.40	8.27	0.836	77.3	6.37	-1.90	-0.25	6.65
0.6	15.0	0.65	0.20	0.10	8.27	0.836	77.3	7.18	-1.10	-0.24	7.27
0.6	15.0	0.65	0.20	0.20	8.27	0.836	77.3	6.43	1.00	-0.27	6.52
0.6	15.0	0.65	0.20	0.30	8.27	0.836	77.3	5.90	-0.95	-0.25	5.99
0.6	15.0	0.65	0.20	0.40	8.27	0.836	77.3	5.39	-0.95	-0.28	5.49
0.6	15.0	0.65	0.30	0.10	8.27	0.836	77.3	6.68	-0.84	-0.26	6.74
0.6	15.0	0.65	0.30	0.20	8.27	0.836	77.3	5.59	-0.71	-0.28	5.65
0.6	15.0	0.65	0.30	0.30	8.27	0.836	77.3	4.93	-0.64	-0.21	4.98

β	γ	τ	a/T	a/c	SCF	DoB	ϕ_{hs}	Y_{1a}	Y_{2a}	Y_{3a}	Y_{ea}
0.6	15.0	0.65	0.30	0.40	8.27	0.836	77.3	4.39	-0.61	-0.16	4.44
0.6	15.0	0.65	0.40	0.10	8.27	0.836	77.3	6.49	-0.71	-0.27	6.54
0.6	15.0	0.65	0.40	0.20	8.27	0.836	77.3	5.02	-0.56	-0.26	5.06
0.6	15.0	0.65	0.40	0.30	8.27	0.836	77.3	4.28	-0.48	-0.24	4.31
0.6	15.0	0.65	0.40	0.40	8.27	0.836	77.3	3.73	-0.44	-0.20	3.77
0.6	15.0	0.65	0.50	0.10	8.27	0.836	77.3	---	---	---	---
0.6	15.0	0.65	0.50	0.20	8.27	0.836	77.3	4.65	-0.48	-0.29	4.68
0.6	15.0	0.65	0.50	0.30	8.27	0.836	77.3	3.72	-0.41	-0.26	3.75
0.6	15.0	0.65	0.50	0.40	8.27	0.836	77.3	3.14	-0.36	-0.23	3.17
0.6	15.0	0.65	0.60	0.10	8.27	0.836	77.3	---	---	---	---
0.6	15.0	0.65	0.60	0.20	8.27	0.836	77.3	4.18	-0.47	-0.31	4.23
0.6	15.0	0.65	0.60	0.30	8.27	0.836	77.3	3.13	-0.39	-0.28	3.17
0.6	15.0	0.65	0.60	0.40	8.27	0.836	77.3	2.55	-0.34	-0.26	2.59
0.6	15.0	0.65	0.70	0.10	8.27	0.836	77.3	---	---	---	---
0.6	15.0	0.65	0.70	0.20	8.27	0.836	77.3	3.58	-0.50	-0.33	3.64
0.6	15.0	0.65	0.70	0.30	8.27	0.836	77.3	2.54	-0.39	-0.31	2.60
0.6	15.0	0.65	0.70	0.40	8.27	0.836	77.3	1.87	-0.35	-0.29	1.94
0.6	15.0	0.65	0.80	0.10	8.27	0.836	77.3	---	---	---	---
0.6	15.0	0.65	0.80	0.20	8.27	0.836	77.3	2.77	-0.60	-0.35	2.86
0.6	15.0	0.65	0.80	0.30	8.27	0.836	77.3	1.73	-0.47	-0.34	1.83
0.6	15.0	0.65	0.80	0.40	8.27	0.836	77.3	1.10	-0.41	-0.32	1.24
0.6	15.0	0.80	0.10	0.10	10.51	0.841	77.3	10.82	-2.35	-0.35	11.08
0.6	15.0	0.80	0.10	0.20	10.51	0.841	77.3	10.10	-2.36	-0.36	0.38
0.6	15.0	0.80	0.10	0.30	10.51	0.841	77.3	9.02	-2.53	-0.30	9.37
0.6	15.0	0.80	0.10	0.40	10.51	0.841	77.3	8.04	-2.46	-0.32	8.42
0.6	15.0	0.80	0.20	0.10	10.51	0.841	77.3	8.92	-1.36	-0.32	9.03
0.6	15.0	0.80	0.20	0.20	10.51	0.841	77.3	8.01	-1.24	-0.35	8.11
0.6	15.0	0.80	0.20	0.30	10.51	0.841	77.3	7.35	-1.19	-0.31	7.45
0.6	15.0	0.80	0.20	0.40	10.51	0.841	77.3	6.73	-1.19	-0.36	6.85
0.6	15.0	0.80	0.30	0.10	10.51	0.841	77.3	8.25	-1.02	-0.33	8.32
0.6	15.0	0.80	0.30	0.20	10.51	0.841	77.3	6.90	-0.86	-0.32	6.96
0.6	15.0	0.80	0.30	0.30	10.51	0.841	77.3	6.11	-0.77	-0.27	6.17
0.6	15.0	0.80	0.30	0.40	10.51	0.841	77.3	5.45	-0.74	-0.21	5.51
0.6	15.0	0.80	0.40	0.10	10.51	0.841	77.3	7.97	-0.87	-0.34	8.03
0.6	15.0	0.80	0.40	0.20	10.51	0.841	77.3	6.16	-0.68	-0.33	6.21

β	γ	τ	a/T	a/c	SCF	DoB	ϕ_{hs}	Y_{1a}	Y_{2a}	Y_{3a}	Y_{ea}
0.6	15.0	0.80	0.40	0.30	10.51	0.841	77.3	5.26	-0.58	-0.31	5.31
0.6	15.0	0.80	0.40	0.40	10.51	0.841	77.3	4.61	-0.52	-0.25	4.65
0.6	15.0	0.80	0.50	0.10	10.51	0.841	77.3	---	---	---	---
0.6	15.0	0.80	0.50	0.20	10.51	0.841	77.3	5.65	-0.58	-0.37	5.70
0.6	15.0	0.80	0.50	0.30	10.51	0.841	77.3	4.53	-0.48	-0.34	4.57
0.6	15.0	0.80	0.50	0.40	10.51	0.841	77.3	3.83	-0.42	-0.29	3.87
0.6	15.0	0.80	0.60	0.10	10.51	0.841	77.3	---	---	---	---
0.6	15.0	0.80	0.60	0.20	10.51	0.841	77.3	5.04	-0.56	-0.39	5.10
0.6	15.0	0.80	0.60	0.30	10.51	0.841	77.3	3.77	-0.45	-0.36	3.82
0.6	15.0	0.80	0.60	0.40	10.51	0.841	77.3	3.07	-0.39	-0.32	3.12
0.6	15.0	0.80	0.70	0.10	10.51	0.841	77.3	---	---	---	---
0.6	15.0	0.80	0.70	0.20	10.51	0.841	77.3	4.28	-0.59	-0.41	4.35
0.6	15.0	0.80	0.70	0.30	10.51	0.841	77.3	3.01	-0.45	-0.40	3.08
0.6	15.0	0.80	0.70	0.40	10.51	0.841	77.3	2.22	-0.39	-0.36	2.29
0.6	15.0	0.80	0.80	0.10	10.51	0.841	77.3	---	---	---	---
0.6	15.0	0.80	0.80	0.20	10.51	0.841	77.3	3.21	-0.69	-0.44	3.33
0.6	15.0	0.80	0.80	0.30	10.51	0.841	77.3	1.95	-0.51	-0.43	2.08
0.6	15.0	0.80	0.80	0.40	10.51	0.841	77.3	1.25	-0.45	-0.40	1.41
0.6	15.0	1.00	0.10	0.10	13.45	0.846	77.3	13.71	-2.88	-0.54	14.02
0.6	15.0	1.00	0.10	0.20	13.45	0.846	77.3	12.79	-2.91	-0.50	13.13
0.6	15.0	1.00	0.10	0.30	13.45	0.846	77.3	11.49	-3.11	-0.42	11.91
0.6	15.0	1.00	0.10	0.40	13.45	0.846	77.3	10.33	-3.04	-0.43	10.78
0.6	15.0	1.00	0.20	0.10	13.45	0.846	77.3	11.17	-1.65	-0.44	11.30
0.6	15.0	1.00	0.20	0.20	13.45	0.846	77.3	10.06	-1.49	-0.48	10.18
0.6	15.0	1.00	0.20	0.30	13.45	0.846	77.3	9.25	-1.43	-0.42	9.37
0.6	15.0	1.00	0.20	0.40	13.45	0.846	77.3	8.48	-1.43	-0.48	8.62
0.6	15.0	1.00	0.30	0.10	13.45	0.846	77.3	10.26	-1.23	-0.43	10.35
0.6	15.0	1.00	0.30	0.20	13.45	0.846	77.3	8.60	-1.02	-0.44	8.67
0.6	15.0	1.00	0.30	0.30	13.45	0.846	77.3	7.65	-0.91	-0.36	7.72
0.6	15.0	1.00	0.30	0.40	13.45	0.846	77.3	6.86	-0.88	-0.28	6.92
0.6	15.0	1.00	0.40	0.10	13.45	0.846	77.3	9.86	-1.06	-0.44	9.93
0.6	15.0	1.00	0.40	0.20	13.45	0.846	77.3	7.61	-0.81	-0.43	7.67
0.6	15.0	1.00	0.40	0.30	13.45	0.846	77.3	6.53	-0.68	-0.40	6.58
0.6	15.0	1.00	0.40	0.40	13.45	0.846	77.3	5.74	-0.62	-0.33	5.79
0.6	15.0	1.00	0.50	0.10	13.45	0.846	77.3	---	---	---	---

β	γ	τ	a/T	a/c	SCF	DoB	ϕ_{hs}	Y_{1a}	Y_{2a}	Y_{3a}	Y_{ea}
0.6	15.0	1.00	0.50	0.20	13.45	0.846	77.3	6.93	-0.69	-0.46	6.98
0.6	15.0	1.00	0.50	0.30	13.45	0.846	77.3	5.55	-0.57	-0.43	5.60
0.6	15.0	1.00	0.50	0.40	13.45	0.846	77.3	4.72	-0.49	-0.37	4.76
0.6	15.0	1.00	0.60	0.10	13.45	0.846	77.3	---	---	---	---
0.6	15.0	1.00	0.60	0.20	13.45	0.846	77.3	6.12	-0.66	-0.49	6.18
0.6	15.0	1.00	0.60	0.30	13.45	0.846	77.3	4.57	-0.52	-0.46	4.63
0.6	15.0	1.00	0.60	0.40	13.45	0.846	77.3	3.72	-0.44	-0.41	3.78
0.6	15.0	1.00	0.70	0.10	13.45	0.846	77.3	---	---	---	---
0.6	15.0	1.00	0.70	0.20	13.45	0.846	77.3	5.14	-0.69	-0.51	5.22
0.6	15.0	1.00	0.70	0.30	13.45	0.846	77.3	3.59	-0.51	-0.50	3.68
0.6	15.0	1.00	0.70	0.40	13.45	0.846	77.3	2.64	-0.44	-0.45	2.73
0.6	15.0	1.00	0.80	0.10	13.45	0.846	77.3	---	---	---	---
0.6	15.0	1.00	0.80	0.20	13.45	0.846	77.3	3.80	-0.76	-0.55	3.94
0.6	15.0	1.00	0.80	0.30	13.45	0.846	77.3	2.28	-0.54	-0.53	2.43
0.6	15.0	1.00	0.80	0.40	13.45	0.846	77.3	1.42	-0.47	-0.50	1.61
0.6	20.0	0.20	0.10	0.10	2.51	0.812	61.5	2.40	-0.33	-0.14	2.43
0.6	20.0	0.20	0.10	0.20	2.51	0.812	61.5	2.15	-0.34	-0.15	2.18
0.6	20.0	0.20	0.10	0.30	2.51	0.812	61.5	1.83	-0.38	-0.13	1.88
0.6	20.0	0.20	0.10	0.40	2.51	0.812	61.5	1.62	-0.33	-0.14	1.66
0.6	20.0	0.20	0.20	0.10	2.51	0.812	61.5	2.30	-0.13	-0.09	2.14
0.6	20.0	0.20	0.20	0.20	2.51	0.812	61.5	1.92	-0.11	-0.11	1.93
0.6	20.0	0.20	0.20	0.30	2.51	0.812	61.5	1.71	-0.11	-0.11	1.72
0.6	20.0	0.20	0.20	0.40	2.51	0.812	61.5	1.53	-0.12	-0.10	1.54
0.6	20.0	0.20	0.30	0.10	2.51	0.812	61.5	2.10	-0.05	-0.08	2.10
0.6	20.0	0.20	0.30	0.20	2.51	0.812	61.5	1.76	-0.08	-0.09	1.76
0.6	20.0	0.20	0.30	0.30	2.51	0.812	61.5	1.54	-0.06	-0.09	1.55
0.6	20.0	0.20	0.30	0.40	2.51	0.812	61.5	1.35	-0.05	-0.09	1.36
0.6	20.0	0.20	0.40	0.10	2.51	0.812	61.5	2.05	-0.04	-0.07	2.05
0.6	20.0	0.20	0.40	0.20	2.51	0.812	61.5	1.59	-0.08	-0.06	1.60
0.6	20.0	0.20	0.40	0.30	2.51	0.812	61.5	1.32	-0.08	-0.06	1.32
0.6	20.0	0.20	0.40	0.40	2.51	0.812	61.5	1.12	-0.06	-0.04	1.12
0.6	20.0	0.20	0.50	0.10	2.51	0.812	61.5	2.06	-0.03	-0.06	2.06
0.6	20.0	0.20	0.50	0.20	2.51	0.812	61.5	1.46	-0.08	-0.07	1.46
0.6	20.0	0.20	0.50	0.30	2.51	0.812	61.5	1.16	-0.07	-0.06	1.16
0.6	20.0	0.20	0.50	0.40	2.51	0.812	61.5	0.96	-0.07	-0.05	0.97

β	γ	τ	a/T	a/c	SCF	DoB	ϕ_{hs}	Y_{1a}	Y_{2a}	Y_{3a}	Y_{ea}
0.6	20.0	0.20	0.60	0.10	2.51	0.812	61.5	---	---	---	---
0.6	20.0	0.20	0.60	0.20	2.51	0.812	61.5	1.39	-0.08	-0.06	1.40
0.6	20.0	0.20	0.60	0.30	2.51	0.812	61.5	1.02	-0.09	-0.07	1.03
0.6	20.0	0.20	0.60	0.40	2.51	0.812	61.5	0.80	-0.08	-0.06	0.81
0.6	20.0	0.20	0.70	0.10	2.51	0.812	61.5	---	---	---	---
0.6	20.0	0.20	0.70	0.20	2.51	0.812	61.5	1.22	-0.12	-0.07	1.23
0.6	20.0	0.20	0.70	0.30	2.51	0.812	61.5	0.84	-0.13	-0.07	0.85
0.6	20.0	0.20	0.70	0.40	2.51	0.812	61.5	0.62	-0.11	-0.07	0.64
0.6	20.0	0.20	0.80	0.10	2.51	0.812	61.5	---	---	---	---
0.6	20.0	0.20	0.80	0.20	2.51	0.812	61.5	0.93	-0.20	-0.08	0.96
0.6	20.0	0.20	0.80	0.30	2.51	0.812	61.5	0.58	-0.19	-0.08	0.61
0.6	20.0	0.20	0.80	0.40	2.51	0.812	61.5	0.38	-0.16	-0.07	0.43
0.6	20.0	0.30	0.27	0.20	4.16	0.824	61.5	3.10	-0.25	-0.12	3.12
0.6	20.0	0.40	0.10	0.10	5.89	0.831	61.5	6.28	-1.15	-0.11	6.39
0.6	20.0	0.40	0.10	0.20	5.89	0.831	61.5	5.78	-1.25	-0.16	5.91
0.6	20.0	0.40	0.10	0.30	5.89	0.831	61.5	4.98	-1.34	-0.13	5.16
0.6	20.0	0.40	0.10	0.40	5.89	0.831	61.5	4.40	-1.22	-0.17	4.58
0.6	20.0	0.40	0.20	0.10	5.89	0.831	61.5	5.28	-0.67	-0.09	5.32
0.6	20.0	0.40	0.20	0.20	5.89	0.831	61.5	4.78	-0.60	-0.13	4.82
0.6	20.0	0.40	0.20	0.30	5.89	0.831	61.5	4.31	-0.56	-0.13	4.35
0.6	20.0	0.40	0.20	0.40	5.89	0.831	61.5	3.90	-0.58	-0.15	3.95
0.6	20.0	0.40	0.30	0.10	5.89	0.831	61.5	4.95	-0.44	-0.17	4.97
0.6	20.0	0.40	0.30	0.20	5.89	0.831	61.5	4.17	-0.42	-0.14	4.19
0.6	20.0	0.40	0.30	0.30	5.89	0.831	61.5	3.71	-0.36	-0.16	3.73
0.6	20.0	0.40	0.30	0.40	5.89	0.831	61.5	3.31	-0.32	-0.15	3.33
0.6	20.0	0.40	0.40	0.10	5.89	0.831	61.5	4.77	-0.35	-0.18	4.79
0.6	20.0	0.40	0.40	0.20	5.89	0.831	61.5	3.72	-0.31	-0.14	3.74
0.6	20.0	0.40	0.40	0.30	5.89	0.831	61.5	3.17	-0.24	-0.13	3.18
0.6	20.0	0.40	0.40	0.40	5.89	0.831	61.5	2.69	-0.21	-0.11	2.70
0.6	20.0	0.40	0.50	0.10	5.89	0.831	61.5	4.70	-0.27	-0.12	4.71
0.6	20.0	0.40	0.50	0.20	5.89	0.831	61.5	3.38	-0.25	-0.15	3.40
0.6	20.0	0.40	0.50	0.30	5.89	0.831	61.5	2.74	-0.19	-0.15	2.75
0.6	20.0	0.40	0.50	0.40	5.89	0.831	61.5	2.27	-0.15	-0.13	2.28
0.6	20.0	0.40	0.60	0.10	5.89	0.831	61.5	---	---	---	---
0.6	20.0	0.40	0.60	0.20	5.89	0.831	61.5	3.15	-0.22	-0.16	3.17

β	γ	τ	a/T	a/c	SCF	DoB	ϕ_{hs}	Y_{1a}	Y_{2a}	Y_{3a}	Y_{ea}
0.6	20.0	0.40	0.60	0.30	5.89	0.831	61.5	2.34	-0.21	-0.17	2.36
0.6	20.0	0.40	0.60	0.40	5.89	0.831	61.5	1.87	-0.18	-0.16	1.89
0.6	20.0	0.40	0.70	0.10	5.89	0.831	61.5	---	---	---	---
0.6	20.0	0.40	0.70	0.20	5.89	0.831	61.5	2.59	-0.31	-0.18	2.62
0.6	20.0	0.40	0.70	0.30	5.89	0.831	61.5	1.86	-0.27	-0.20	1.90
0.6	20.0	0.40	0.70	0.40	5.89	0.831	61.5	1.38	-0.23	-0.18	1.42
0.6	20.0	0.40	0.80	0.10	5.89	0.831	61.5	---	---	---	---
0.6	20.0	0.40	0.80	0.20	5.89	0.831	61.5	1.89	-0.45	-0.21	1.96
0.6	20.0	0.40	0.80	0.30	5.89	0.831	61.5	1.21	-0.39	-0.22	1.30
0.6	20.0	0.40	0.80	0.40	5.89	0.831	61.5	0.81	-0.32	-0.20	0.90
0.6	20.0	0.60	0.10	0.10	9.74	0.847	77.3	10.20	-2.18	-0.09	10.44
0.6	20.0	0.60	0.10	0.20	9.74	0.847	77.3	9.48	-2.37	-0.17	9.78
0.6	20.0	0.60	0.10	0.30	9.74	0.847	77.3	8.26	-2.49	-0.14	8.63
0.6	20.0	0.60	0.10	0.40	9.74	0.847	77.3	7.28	-2.27	-0.23	7.63
0.6	20.0	0.60	0.20	0.10	9.74	0.847	77.3	8.36	-1.24	-0.16	8.46
0.6	20.0	0.60	0.20	0.20	9.74	0.847	77.3	7.56	-1.14	-0.17	7.65
0.6	20.0	0.60	0.20	0.30	9.74	0.847	77.3	6.90	-1.08	-0.16	6.99
0.6	20.0	0.60	0.20	0.40	9.74	0.847	77.3	6.25	-1.12	-0.21	6.36
0.6	20.0	0.60	0.30	0.10	9.74	0.847	77.3	7.70	-0.82	-0.26	7.75
0.6	20.0	0.60	0.30	0.20	9.74	0.847	77.3	6.49	-0.78	-0.29	6.54
0.6	20.0	0.60	0.30	0.30	9.74	0.847	77.3	5.79	-0.66	-0.24	5.83
0.6	20.0	0.60	0.30	0.40	9.74	0.847	77.3	5.21	-0.65	-0.30	5.27
0.6	20.0	0.60	0.40	0.10	9.74	0.847	77.3	7.34	-0.64	-0.27	7.37
0.6	20.0	0.60	0.40	0.20	9.74	0.847	77.3	5.74	-0.52	-0.21	5.77
0.6	20.0	0.60	0.40	0.30	9.74	0.847	77.3	4.89	-0.43	-0.19	4.91
0.6	20.0	0.60	0.40	0.40	9.74	0.847	77.3	4.21	-0.38	-0.15	4.23
0.6	20.0	0.60	0.50	0.10	9.74	0.847	77.3	7.14	-0.56	-0.26	7.17
0.6	20.0	0.60	0.50	0.20	9.74	0.847	77.3	5.14	-0.44	-0.24	5.17
0.6	20.0	0.60	0.50	0.30	9.74	0.847	77.3	4.20	-0.34	-0.24	4.22
0.6	20.0	0.60	0.50	0.40	9.74	0.847	77.3	3.51	-0.28	-0.20	3.53
0.6	20.0	0.60	0.60	0.10	9.74	0.847	77.3	---	---	---	---
0.6	20.0	0.60	0.60	0.20	9.74	0.847	77.3	4.61	-0.39	-0.30	4.64
0.6	20.0	0.60	0.60	0.30	9.74	0.847	77.3	3.50	-0.34	-0.28	3.53
0.6	20.0	0.60	0.60	0.40	9.74	0.847	77.3	2.82	-0.27	-0.25	2.85
0.6	20.0	0.60	0.70	0.10	9.74	0.847	77.3	---	---	---	---

β	γ	τ	a/T	a/c	SCF	DoB	ϕ_{hs}	Y_{1a}	Y_{2a}	Y_{3a}	Y_{ea}
0.6	20.0	0.60	0.70	0.20	9.74	0.847	77.3	3.84	-0.43	-0.33	3.89
0.6	20.0	0.60	0.70	0.30	9.74	0.847	77.3	2.71	-0.40	-0.32	2.76
0.6	20.0	0.60	0.70	0.40	9.74	0.847	77.3	2.06	-0.31	-0.29	2.11
0.6	20.0	0.60	0.80	0.10	9.74	0.847	77.3	---	---	---	---
0.6	20.0	0.60	0.80	0.20	9.74	0.847	77.3	2.82	-0.60	-0.36	2.92
0.6	20.0	0.60	0.80	0.30	9.74	0.847	77.3	1.77	-0.51	-0.37	1.89
0.6	20.0	0.60	0.80	0.40	9.74	0.847	77.3	1.22	-0.38	-0.35	1.34
0.6	20.0	0.65	0.27	0.20	10.73	0.848	77.3	7.39	-0.90	-0.21	7.45
0.6	20.0	0.80	0.10	0.10	13.71	0.853	77.3	14.01	-3.03	-0.13	14.33
0.6	20.0	0.80	0.10	0.20	13.71	0.853	77.3	13.09	-3.30	-0.24	13.50
0.6	20.0	0.80	0.10	0.30	13.71	0.853	77.3	11.49	-3.49	-0.21	12.01
0.6	20.0	0.80	0.10	0.40	13.71	0.853	77.3	10.16	-3.22	-0.32	10.67
0.6	20.0	0.80	0.20	0.10	13.71	0.853	77.3	11.38	-1.68	-0.27	11.50
0.6	20.0	0.80	0.20	0.20	13.71	0.853	77.3	10.29	-1.55	-0.25	10.41
0.6	20.0	0.80	0.20	0.30	13.71	0.853	77.3	9.42	-1.49	-0.22	9.54
0.6	20.0	0.80	0.20	0.40	13.71	0.853	77.3	8.56	-1.54	-0.30	8.70
0.6	20.0	0.80	0.30	0.10	13.71	0.853	77.3	10.37	-1.09	-0.37	10.44
0.6	20.0	0.80	0.30	0.20	13.71	0.853	77.3	8.78	-1.05	-0.42	8.86
0.6	20.0	0.80	0.30	0.30	13.71	0.853	77.3	7.84	-0.96	-0.44	7.92
0.6	20.0	0.80	0.30	0.40	13.71	0.853	77.3	7.11	-0.89	-0.42	7.18
0.6	20.0	0.80	0.40	0.10	13.71	0.853	77.3	9.82	-0.86	-0.38	9.86
0.6	20.0	0.80	0.40	0.20	13.71	0.853	77.3	7.68	-0.67	-0.31	7.72
0.6	20.0	0.80	0.40	0.30	13.71	0.853	77.3	6.56	-0.55	-0.27	6.60
0.6	20.0	0.80	0.40	0.40	13.71	0.853	77.3	5.71	-0.49	-0.21	5.73
0.6	20.0	0.80	0.50	0.10	13.71	0.853	77.3	9.46	-0.76	-0.37	9.50
0.6	20.0	0.80	0.50	0.20	13.71	0.853	77.3	6.80	-0.56	-0.35	6.83
0.6	20.0	0.80	0.50	0.30	13.71	0.853	77.3	5.57	-0.43	-0.33	5.60
0.6	20.0	0.80	0.50	0.40	13.71	0.853	77.3	4.70	-0.35	-0.28	4.73
0.6	20.0	0.80	0.60	0.10	13.71	0.853	77.3	---	---	---	---
0.6	20.0	0.80	0.60	0.20	13.71	0.853	77.3	6.01	-0.50	-0.43	6.05
0.6	20.0	0.80	0.60	0.30	13.71	0.853	77.3	4.57	-0.42	-0.38	4.61
0.6	20.0	0.80	0.60	0.40	13.71	0.853	77.3	3.70	-0.32	-0.34	3.74
0.6	20.0	0.80	0.70	0.10	13.71	0.853	77.3	---	---	---	---
0.6	20.0	0.80	0.70	0.20	13.71	0.853	77.3	4.93	-0.55	-0.46	4.99
0.6	20.0	0.80	0.70	0.30	13.71	0.853	77.3	3.47	-0.47	-0.45	3.54

β	γ	τ	a/T	a/c	SCF	DoB	ϕ_{hs}	Y_{1a}	Y_{2a}	Y_{3a}	Y_{ea}
0.6	20.0	0.80	0.70	0.40	13.71	0.853	77.3	2.63	-0.36	-0.40	2.70
0.6	20.0	0.80	0.80	0.10	13.71	0.853	77.3	---	---	---	---
0.6	20.0	0.80	0.80	0.20	13.71	0.853	77.3	3.50	-0.71	-0.51	3.62
0.6	20.0	0.80	0.80	0.30	13.71	0.853	77.3	2.17	-0.58	-0.51	2.33
0.6	20.0	0.80	0.80	0.40	13.71	0.853	77.3	1.42	-0.46	-0.47	1.59
0.6	20.0	1.00	0.10	0.10	17.68	0.858	77.3	17.75	-0.41	-0.32	18.22
0.6	20.0	1.00	0.10	0.20	17.68	0.858	77.3	16.64	-4.01	-0.35	17.12
0.6	20.0	1.00	0.10	0.30	17.68	0.858	77.3	14.71	-4.27	-0.30	15.32
0.6	20.0	1.00	0.10	0.40	17.68	0.858	77.3	13.04	-4.02	-0.45	13.66
0.6	20.0	1.00	0.20	0.10	17.68	0.858	77.3	14.31	-2.02	-0.43	14.46
0.6	20.0	1.00	0.20	0.20	17.68	0.858	77.3	12.96	-1.86	-0.36	13.10
0.6	20.0	1.00	0.20	0.30	17.68	0.858	77.3	11.91	-1.79	-0.32	12.05
0.6	20.0	1.00	0.20	0.40	17.68	0.858	77.3	10.85	-1.84	-0.40	11.01
0.6	20.0	1.00	0.30	0.10	17.68	0.858	77.3	12.94	-1.29	-0.50	13.02
0.6	20.0	1.00	0.30	0.20	17.68	0.858	77.3	10.91	-1.10	-0.35	10.97
0.6	20.0	1.00	0.30	0.30	17.68	0.858	77.3	9.67	-0.98	-0.27	9.73
0.6	20.0	1.00	0.30	0.40	17.68	0.858	77.3	8.60	-0.94	-0.19	8.65
0.6	20.0	1.00	0.40	0.10	17.68	0.858	77.3	12.17	-1.03	-0.50	12.23
0.6	20.0	1.00	0.40	0.20	17.68	0.858	77.3	9.53	-0.79	-0.42	9.58
0.6	20.0	1.00	0.40	0.30	17.68	0.858	77.3	8.19	-0.64	-0.36	8.23
0.6	20.0	1.00	0.40	0.40	17.68	0.858	77.3	7.15	-0.57	-0.27	7.18
0.6	20.0	1.00	0.50	0.10	17.68	0.858	77.3	11.64	-0.92	-0.48	11.69
0.6	20.0	1.00	0.50	0.20	17.68	0.858	77.3	8.35	-0.66	-0.46	8.40
0.6	20.0	1.00	0.50	0.30	17.68	0.858	77.3	6.87	-0.50	-0.43	6.91
0.6	20.0	1.00	0.50	0.40	17.68	0.858	77.3	5.83	-0.40	-0.35	5.86
0.6	20.0	1.00	0.60	0.10	17.68	0.858	77.3	---	---	---	---
0.6	20.0	1.00	0.60	0.20	17.68	0.858	77.3	7.31	-0.57	-0.54	7.36
0.6	20.0	1.00	0.60	0.30	17.68	0.858	77.3	5.56	-0.47	-0.49	5.62
0.6	20.0	1.00	0.60	0.40	17.68	0.858	77.3	4.52	-0.35	-0.43	4.57
0.6	20.0	1.00	0.70	0.10	17.68	0.858	77.3	---	---	---	---
0.6	20.0	1.00	0.70	0.20	17.68	0.858	77.3	5.94	-0.62	-0.58	6.01
0.6	20.0	1.00	0.70	0.30	17.68	0.858	77.3	4.17	-0.51	-0.56	4.26
0.6	20.0	1.00	0.70	0.40	17.68	0.858	77.3	3.16	-0.39	-0.50	3.24
0.6	20.0	1.00	0.80	0.10	17.68	0.858	77.3	---	---	---	---
0.6	20.0	1.00	0.80	0.20	17.68	0.858	77.3	4.16	-0.77	-0.64	4.30

β	γ	τ	a/T	a/c	SCF	DoB	ϕ_{hs}	Y_{1a}	Y_{2a}	Y_{3a}	Y_{ea}
0.6	20.0	1.00	0.80	0.30	17.68	0.858	77.3	2.55	-0.64	-0.64	2.74
0.6	20.0	1.00	0.80	0.40	17.68	0.858	77.3	1.62	-0.48	-0.58	1.83
0.6	25.0	0.20	0.10	0.10	2.91	0.821	61.5	2.80	-0.46	-0.12	2.84
0.6	25.0	0.20	0.10	0.20	2.91	0.821	61.5	2.50	-0.49	-0.14	2.56
0.6	25.0	0.20	0.10	0.30	2.91	0.821	61.5	2.14	-0.45	-0.12	2.19
0.6	25.0	0.20	0.10	0.40	2.91	0.821	61.5	1.91	-0.41	-0.13	1.96
0.6	25.0	0.20	0.20	0.10	2.91	0.821	61.5	2.45	-0.16	-0.08	2.46
0.6	25.0	0.20	0.20	0.20	2.91	0.821	61.5	2.19	-0.15	-0.10	2.20
0.6	25.0	0.20	0.20	0.30	2.91	0.821	61.5	1.95	-0.17	-0.09	1.96
0.6	25.0	0.20	0.20	0.40	2.91	0.821	61.5	1.73	-0.18	-0.08	1.75
0.6	25.0	0.20	0.30	0.10	2.91	0.821	61.5	2.29	-0.10	-0.06	2.29
0.6	25.0	0.20	0.30	0.20	2.91	0.821	61.5	1.99	-0.09	-0.08	2.00
0.6	25.0	0.20	0.30	0.30	2.91	0.821	61.5	1.66	-0.06	-0.04	1.66
0.6	25.0	0.20	0.30	0.40	2.91	0.821	61.5	1.41	-0.04	-0.02	1.41
0.6	25.0	0.20	0.40	0.10	2.91	0.821	61.5	2.30	-0.02	-0.07	2.30
0.6	25.0	0.20	0.40	0.20	2.91	0.821	61.5	1.75	-0.07	-0.06	1.76
0.6	25.0	0.20	0.40	0.30	2.91	0.821	61.5	1.46	-0.05	-0.04	1.46
0.6	25.0	0.20	0.40	0.40	2.91	0.821	61.5	1.22	-0.03	-0.02	1.22
0.6	25.0	0.20	0.50	0.10	2.91	0.821	61.5	2.26	0.01	-0.06	2.26
0.6	25.0	0.20	0.50	0.20	2.91	0.821	61.5	1.62	-0.06	-0.06	1.62
0.6	25.0	0.20	0.50	0.30	2.91	0.821	61.5	1.28	-0.06	-0.05	1.29
0.6	25.0	0.20	0.50	0.40	2.91	0.821	61.5	1.06	-0.05	-0.04	1.06
0.6	25.0	0.20	0.60	0.10	2.91	0.821	61.5	2.23	-0.05	-0.07	2.23
0.6	25.0	0.20	0.60	0.20	2.91	0.821	61.5	1.46	-0.10	-0.06	1.46
0.6	25.0	0.20	0.60	0.30	2.91	0.821	61.5	1.11	-0.10	-0.06	1.11
0.6	25.0	0.20	0.60	0.40	2.91	0.821	61.5	0.87	-0.08	-0.05	0.88
0.6	25.0	0.20	0.70	0.10	2.91	0.821	61.5	---	---	---	---
0.6	25.0	0.20	0.70	0.20	2.91	0.821	61.5	1.26	-0.17	-0.07	1.27
0.6	25.0	0.20	0.70	0.30	2.91	0.821	61.5	0.89	-0.15	-0.08	0.91
0.6	25.0	0.20	0.70	0.40	2.91	0.821	61.5	0.66	-0.12	-0.07	0.68
0.6	25.0	0.20	0.80	0.10	2.91	0.821	61.5	---	---	---	---
0.6	25.0	0.20	0.80	0.20	2.91	0.821	61.5	0.96	-0.26	-0.07	0.99
0.6	25.0	0.20	0.80	0.30	2.91	0.821	61.5	0.60	-0.22	-0.09	0.65
0.6	25.0	0.20	0.80	0.40	2.91	0.821	61.5	0.39	-0.17	-0.08	0.44
0.6	25.0	0.40	0.10	0.10	7.00	0.847	77.3	7.50	-1.61	-0.04	7.67

β	γ	τ	a/T	a/c	SCF	DoB	ϕ_{hs}	Y_{1a}	Y_{2a}	Y_{3a}	Y_{ea}
0.6	25.0	0.40	0.10	0.20	7.00	0.847	77.3	6.84	-1.75	-0.11	7.06
0.6	25.0	0.40	0.10	0.30	7.00	0.847	77.3	5.86	-1.87	-0.10	6.15
0.6	25.0	0.40	0.10	0.40	7.00	0.847	77.3	5.20	-1.59	-0.17	5.44
0.6	25.0	0.40	0.20	0.10	7.00	0.847	77.3	6.17	-0.83	-0.06	6.23
0.6	25.0	0.40	0.20	0.20	7.00	0.847	77.3	5.59	-0.77	-0.10	5.64
0.6	25.0	0.40	0.20	0.30	7.00	0.847	77.3	5.01	-0.79	-0.13	5.07
0.6	25.0	0.40	0.20	0.40	7.00	0.847	77.3	4.52	-0.79	-0.13	4.59
0.6	25.0	0.40	0.30	0.10	7.00	0.847	77.3	5.58	-0.57	-0.06	5.61
0.6	25.0	0.40	0.30	0.20	7.00	0.847	77.3	4.83	-0.47	-0.12	4.86
0.6	25.0	0.40	0.30	0.30	7.00	0.847	77.3	4.26	-0.42	-0.14	4.29
0.6	25.0	0.40	0.30	0.40	7.00	0.847	77.3	3.80	-0.39	-0.13	3.82
0.6	25.0	0.40	0.40	0.10	7.00	0.847	77.3	5.42	-0.38	-0.15	5.44
0.6	25.0	0.40	0.40	0.20	7.00	0.847	77.3	4.24	-0.33	-0.13	4.26
0.6	25.0	0.40	0.40	0.30	7.00	0.847	77.3	3.57	-0.26	-0.12	3.58
0.6	25.0	0.40	0.40	0.40	7.00	0.847	77.3	3.02	-0.23	-0.08	3.03
0.6	25.0	0.40	0.50	0.10	7.00	0.847	77.3	5.20	-0.30	-0.17	5.21
0.6	25.0	0.40	0.50	0.20	7.00	0.847	77.3	3.80	-0.28	-0.15	3.81
0.6	25.0	0.40	0.50	0.30	7.00	0.847	77.3	3.06	-0.20	-0.15	3.08
0.6	25.0	0.40	0.50	0.40	7.00	0.847	77.3	2.50	-0.15	-0.12	2.51
0.6	25.0	0.40	0.60	0.10	7.00	0.847	77.3	4.99	-0.33	-0.18	5.00
0.6	25.0	0.40	0.60	0.20	7.00	0.847	77.3	3.35	-0.31	-0.17	3.37
0.6	25.0	0.40	0.60	0.30	7.00	0.847	77.3	2.57	-0.24	-0.19	2.60
0.6	25.0	0.40	0.60	0.40	7.00	0.847	77.3	2.03	-0.18	-0.16	2.05
0.6	25.0	0.40	0.70	0.10	7.00	0.847	77.3	---	---	---	---
0.6	25.0	0.40	0.70	0.20	7.00	0.847	77.3	2.79	-0.41	-0.20	2.83
0.6	25.0	0.40	0.70	0.30	7.00	0.847	77.3	2.01	-0.33	-0.21	2.06
0.6	25.0	0.40	0.70	0.40	7.00	0.847	77.3	1.48	-0.25	-0.19	1.52
0.6	25.0	0.40	0.80	0.10	7.00	0.847	77.3	---	---	---	---
0.6	25.0	0.40	0.80	0.20	7.00	0.847	77.3	2.00	-0.56	-0.20	2.09
0.6	25.0	0.40	0.80	0.30	7.00	0.847	77.3	1.32	-0.44	-0.25	1.43
0.6	25.0	0.40	0.80	0.40	7.00	0.847	77.3	0.86	-0.34	-0.23	0.96
0.6	25.0	0.60	0.10	0.10	11.67	0.853	77.3	12.20	-3.01	0.07	12.56
0.6	25.0	0.60	0.10	0.20	11.67	0.853	77.3	11.26	-3.17	-0.08	11.70
0.6	25.0	0.60	0.10	0.30	11.67	0.853	77.3	9.75	-3.30	-0.08	10.30
0.6	25.0	0.60	0.10	0.40	11.67	0.853	77.3	8.60	-2.98	-0.19	9.10

β	γ	τ	a/T	a/c	SCF	DoB	ϕ_{hs}	Y_{1a}	Y_{2a}	Y_{3a}	Y_{ea}
0.6	25.0	0.60	0.20	0.10	11.67	0.853	77.3	9.78	-1.49	-0.04	9.89
0.6	25.0	0.60	0.20	0.20	11.67	0.853	77.3	8.91	-1.45	-0.10	9.02
0.6	25.0	0.60	0.20	0.30	11.67	0.853	77.3	8.05	-1.42	-0.11	8.18
0.6	25.0	0.60	0.20	0.40	11.67	0.853	77.3	7.30	-1.45	-0.18	7.44
0.6	25.0	0.60	0.30	0.10	11.67	0.853	77.3	8.75	-1.00	-0.12	8.81
0.6	25.0	0.60	0.30	0.20	11.67	0.853	77.3	7.54	-0.85	-0.16	7.59
0.6	25.0	0.60	0.30	0.30	11.67	0.853	77.3	6.72	-0.79	-0.20	6.77
0.6	25.0	0.60	0.30	0.40	11.67	0.853	77.3	6.03	-0.75	-0.18	6.08
0.6	25.0	0.60	0.40	0.10	11.67	0.853	77.3	8.40	-0.73	-0.23	8.43
0.6	25.0	0.60	0.40	0.20	11.67	0.853	77.3	6.58	-0.58	-0.19	6.61
0.6	25.0	0.60	0.40	0.30	11.67	0.853	77.3	5.58	-0.46	-0.17	5.61
0.6	25.0	0.60	0.40	0.40	11.67	0.853	77.3	4.79	-0.41	-0.12	4.81
0.6	25.0	0.60	0.50	0.10	11.67	0.853	77.3	7.97	-0.61	-0.26	8.00
0.6	25.0	0.60	0.50	0.20	11.67	0.853	77.3	5.82	-0.48	-0.25	5.85
0.6	25.0	0.60	0.50	0.30	11.67	0.853	77.3	4.75	-0.36	-0.23	4.77
0.6	25.0	0.60	0.50	0.40	11.67	0.853	77.3	3.96	-0.28	-0.19	3.98
0.6	25.0	0.60	0.60	0.10	11.67	0.853	77.3	7.50	-0.64	-0.30	7.53
0.6	25.0	0.60	0.60	0.20	11.67	0.853	77.3	5.03	-0.52	-0.30	5.07
0.6	25.0	0.60	0.60	0.30	11.67	0.853	77.3	3.91	-0.39	-0.30	3.95
0.6	25.0	0.60	0.60	0.40	11.67	0.853	77.3	3.13	-0.28	-0.26	3.16
0.6	25.0	0.60	0.70	0.10	11.67	0.853	77.3	---	---	---	---
0.6	25.0	0.60	0.70	0.20	11.67	0.853	77.3	4.12	-0.62	-0.35	4.19
0.6	25.0	0.60	0.70	0.30	11.67	0.853	77.3	3.00	-0.47	-0.36	3.07
0.6	25.0	0.60	0.70	0.40	11.67	0.853	77.3	2.26	-0.33	-0.32	2.31
0.6	25.0	0.60	0.80	0.10	11.67	0.853	77.3	---	---	---	---
0.6	25.0	0.60	0.80	0.20	11.67	0.853	77.3	3.04	-0.75	-0.37	3.16
0.6	25.0	0.60	0.80	0.30	11.67	0.853	77.3	1.95	-0.58	-0.42	2.10
0.6	25.0	0.60	0.80	0.40	11.67	0.853	77.3	1.27	-0.41	-0.39	1.42
0.6	25.0	0.80	0.10	0.10	16.48	0.859	77.3	16.75	-4.15	0.08	17.26
0.6	25.0	0.80	0.10	0.20	16.48	0.859	77.3	15.57	-4.35	-0.10	16.16
0.6	25.0	0.80	0.10	0.30	16.48	0.859	77.3	13.57	-4.90	-0.10	14.33
0.6	25.0	0.80	0.10	0.40	16.48	0.859	77.3	11.98	-4.22	-0.27	12.70
0.6	25.0	0.80	0.20	0.10	16.48	0.859	77.3	13.29	-2.07	-0.13	13.45
0.6	25.0	0.80	0.20	0.20	16.48	0.859	77.3	12.15	-1.97	-0.15	12.31
0.6	25.0	0.80	0.20	0.30	16.48	0.859	77.3	11.07	-1.90	-0.16	11.23
0.6	25.0	0.80	0.20	0.40	16.48	0.859	77.3	10.03	-1.97	-0.25	10.22

β	γ	τ	a/T	a/c	SCF	DoB	ϕ_{hs}	Y_{1a}	Y_{2a}	Y_{3a}	Y_{ea}
0.6	25.0	0.80	0.30	0.10	16.48	0.859	77.3	11.85	-1.31	-0.20	11.92
0.6	25.0	0.80	0.30	0.20	16.48	0.859	77.3	10.22	-1.19	-0.31	10.29
0.6	25.0	0.80	0.30	0.30	16.48	0.859	77.3	9.15	-1.06	-0.28	9.22
0.6	25.0	0.80	0.30	0.40	16.48	0.859	77.3	8.27	-1.09	-0.37	8.35
0.6	25.0	0.80	0.40	0.10	16.48	0.859	77.3	11.26	-0.97	-0.34	11.31
0.6	25.0	0.80	0.40	0.20	16.48	0.859	77.3	8.84	-0.74	-0.28	8.88
0.6	25.0	0.80	0.40	0.30	16.48	0.859	77.3	7.55	-0.60	-0.23	7.58
0.6	25.0	0.80	0.40	0.40	16.48	0.859	77.3	6.53	-0.53	-0.17	6.55
0.6	25.0	0.80	0.50	0.10	16.48	0.859	77.3	10.58	-0.82	-0.37	10.62
0.6	25.0	0.80	0.50	0.20	16.48	0.859	77.3	7.73	-0.62	-0.35	7.77
0.6	25.0	0.80	0.50	0.30	16.48	0.859	77.3	6.36	-0.46	-0.32	6.38
0.6	25.0	0.80	0.50	0.40	16.48	0.859	77.3	5.33	-0.36	-0.26	5.35
0.6	25.0	0.80	0.60	0.10	16.48	0.859	77.3	9.86	-0.86	-0.42	9.91
0.6	25.0	0.80	0.60	0.20	16.48	0.859	77.3	6.60	-0.65	-0.42	6.65
0.6	25.0	0.80	0.60	0.30	16.48	0.859	77.3	5.16	-0.47	-0.41	5.20
0.6	25.0	0.80	0.60	0.40	16.48	0.859	77.3	4.16	-0.34	-0.35	4.19
0.6	25.0	0.80	0.70	0.10	16.48	0.859	77.3	---	---	---	---
0.6	25.0	0.80	0.70	0.20	16.48	0.859	77.3	5.35	-0.77	-0.50	5.44
0.6	25.0	0.80	0.70	0.30	16.48	0.859	77.3	3.89	-0.56	-0.49	3.98
0.6	25.0	0.80	0.70	0.40	16.48	0.859	77.3	2.94	-0.39	-0.43	3.01
0.6	25.0	0.80	0.80	0.10	16.48	0.859	77.3	---	---	---	---
0.6	25.0	0.80	0.80	0.20	16.48	0.859	77.3	3.71	-0.89	-0.53	3.87
0.6	25.0	0.80	0.80	0.30	16.48	0.859	77.3	2.42	-0.67	-0.58	2.60
0.6	25.0	0.80	0.80	0.40	16.48	0.859	77.3	1.55	-0.49	-0.53	1.74
0.6	25.0	1.00	0.10	0.10	21.33	0.864	77.3	21.24	-5.03	0.02	21.83
0.6	25.0	1.00	0.10	0.20	21.33	0.864	77.3	19.84	-5.25	-0.17	20.52
0.6	25.0	1.00	0.10	0.30	21.33	0.864	77.3	17.49	-5.53	-0.18	18.34
0.6	25.0	1.00	0.10	0.40	21.33	0.864	77.3	15.43	-5.25	-0.23	16.30
0.6	25.0	1.00	0.20	0.10	21.33	0.864	77.3	16.75	-2.48	-0.26	16.94
0.6	25.0	1.00	0.20	0.20	21.33	0.864	77.3	15.35	-2.35	-0.25	15.53
0.6	25.0	1.00	0.20	0.30	21.33	0.864	77.3	14.02	-2.28	-0.23	14.21
0.6	25.0	1.00	0.20	0.40	21.33	0.864	77.3	12.74	-2.35	-0.35	12.96
0.6	25.0	1.00	0.30	0.10	21.33	0.864	77.3	14.85	-1.70	-0.33	14.95
0.6	25.0	1.00	0.30	0.20	21.33	0.864	77.3	12.85	-1.41	-0.44	12.93
0.6	25.0	1.00	0.30	0.30	21.33	0.864	77.3	11.55	-1.26	-0.40	11.63

β	γ	τ	a/T	a/c	SCF	DoB	ϕ_{hs}	Y_{1a}	Y_{2a}	Y_{3a}	Y_{ea}
0.6	25.0	1.00	0.30	0.40	21.33	0.864	77.3	10.49	-1.29	-0.49	10.59
0.6	25.0	1.00	0.40	0.10	21.33	0.864	77.3	13.97	-1.16	-0.45	14.02
0.6	25.0	1.00	0.40	0.20	21.33	0.864	77.3	11.00	-0.87	-0.38	11.05
0.6	25.0	1.00	0.40	0.30	21.33	0.864	77.3	9.47	-0.70	-0.31	9.50
0.6	25.0	1.00	0.40	0.40	21.33	0.864	77.3	8.23	-0.61	-0.22	8.26
0.6	25.0	1.00	0.50	0.10	21.33	0.864	77.3	13.03	-0.99	-0.49	13.08
0.6	25.0	1.00	0.50	0.20	21.33	0.864	77.3	9.52	-0.72	-0.47	9.57
0.6	25.0	1.00	0.50	0.30	21.33	0.864	77.3	7.87	-0.52	-0.41	7.90
0.6	25.0	1.00	0.50	0.40	21.33	0.864	77.3	6.66	-0.40	-0.33	6.68
0.6	25.0	1.00	0.60	0.10	21.33	0.864	77.3	12.05	-1.03	-0.55	12.11
0.6	25.0	1.00	0.60	0.20	21.33	0.864	77.3	8.06	-0.75	-0.55	8.12
0.6	25.0	1.00	0.60	0.30	21.33	0.864	77.3	6.32	-0.53	-0.52	6.37
0.6	25.0	1.00	0.60	0.40	21.33	0.864	77.3	5.12	-0.37	-0.44	5.16
0.6	25.0	1.00	0.70	0.10	21.33	0.864	77.3	---	---	---	---
0.6	25.0	1.00	0.70	0.20	21.33	0.864	77.3	6.46	-0.88	-0.64	6.57
0.6	25.0	1.00	0.70	0.30	21.33	0.864	77.3	4.70	-0.61	-0.61	4.79
0.6	25.0	1.00	0.70	0.40	21.33	0.864	77.3	3.55	-0.42	-0.54	3.63
0.6	25.0	1.00	0.80	0.10	21.33	0.864	77.3	---	---	---	---
0.6	25.0	1.00	0.80	0.20	21.33	0.864	77.3	4.42	-0.99	-0.68	4.60
0.6	25.0	1.00	0.80	0.30	21.33	0.864	77.3	2.84	-0.74	-0.71	3.06
0.6	25.0	1.00	0.80	0.40	21.33	0.864	77.3	1.79	-0.52	-0.64	2.02
0.6	30.0	0.20	0.10	0.10	3.23	0.825	61.5	3.06	-0.57	-0.11	3.12
0.6	30.0	0.20	0.10	0.20	3.23	0.825	61.5	2.77	-0.63	-0.13	2.84
0.6	30.0	0.20	0.10	0.30	3.23	0.825	61.5	2.39	-0.54	-0.09	2.45
0.6	30.0	0.20	0.10	0.40	3.23	0.825	61.5	2.17	-0.49	-0.12	2.23
0.6	30.0	0.20	0.20	0.10	3.23	0.825	61.5	2.64	-0.22	-0.08	2.65
0.6	30.0	0.20	0.20	0.20	3.23	0.825	61.5	2.37	-0.22	-0.09	2.38
0.6	30.0	0.20	0.20	0.30	3.23	0.825	61.5	2.10	-0.24	-0.08	2.12
0.6	30.0	0.20	0.20	0.40	3.23	0.825	61.5	1.88	-0.25	-0.07	1.90
0.6	30.0	0.20	0.30	0.10	3.23	0.825	61.5	2.44	-0.12	-0.05	2.44
0.6	30.0	0.20	0.30	0.20	3.23	0.825	61.5	2.12	-0.11	-0.08	2.13
0.6	30.0	0.20	0.30	0.30	3.23	0.825	61.5	1.81	-0.10	-0.08	1.82
0.6	30.0	0.20	0.30	0.40	3.23	0.825	61.5	1.59	-0.07	-0.08	1.60
0.6	30.0	0.20	0.40	0.10	3.23	0.825	61.5	2.33	-0.07	-0.03	2.33
0.6	30.0	0.20	0.40	0.20	3.23	0.825	61.5	1.88	-0.07	-0.06	1.88

β	γ	τ	a/T	a/c	SCF	DoB	ϕ_{hs}	Y_{1a}	Y_{2a}	Y_{3a}	Y_{ea}
0.6	30.0	0.20	0.40	0.30	3.23	0.825	61.5	1.53	-0.03	-0.03	1.53
0.6	30.0	0.20	0.40	0.40	3.23	0.825	61.5	1.27	-0.01	-0.01	1.27
0.6	30.0	0.20	0.50	0.10	3.23	0.825	61.5	2.37	0.02	-0.05	2.38
0.6	30.0	0.20	0.50	0.20	3.23	0.825	61.5	1.69	-0.06	-0.05	1.69
0.6	30.0	0.20	0.50	0.30	3.23	0.825	61.5	1.35	-0.05	-0.04	1.35
0.6	30.0	0.20	0.50	0.40	3.23	0.825	61.5	1.09	-0.03	-0.02	1.09
0.6	30.0	0.20	0.60	0.10	3.23	0.825	61.5	2.32	-0.05	-0.05	2.32
0.6	30.0	0.20	0.60	0.20	3.23	0.825	61.5	1.53	-0.11	-0.06	1.53
0.6	30.0	0.20	0.60	0.30	3.23	0.825	61.5	1.15	-0.09	-0.06	1.16
0.6	30.0	0.20	0.60	0.40	3.23	0.825	61.5	0.90	-0.07	-0.05	0.90
0.6	30.0	0.20	0.70	0.10	3.23	0.825	61.5	2.18	-0.18	-0.07	2.19
0.6	30.0	0.20	0.70	0.20	3.23	0.825	61.5	1.31	-0.20	-0.08	1.33
0.6	30.0	0.20	0.70	0.30	3.23	0.825	61.5	0.92	-0.16	-0.08	0.94
0.6	30.0	0.20	0.70	0.40	3.23	0.825	61.5	0.68	-0.12	-0.06	0.69
0.6	30.0	0.20	0.80	0.10	3.23	0.825	61.5	1.81	-0.48	-0.08	1.87
0.6	30.0	0.20	0.80	0.20	3.23	0.825	61.5	0.99	-0.32	-0.09	1.05
0.6	30.0	0.20	0.80	0.30	3.23	0.825	61.5	0.62	-0.24	-0.09	0.67
0.6	30.0	0.20	0.80	0.40	3.23	0.825	61.5	0.39	-0.18	-0.08	0.43
0.6	30.0	0.40	0.10	0.10	7.96	0.849	77.3	8.45	2.01	-0.03	8.69
0.6	30.0	0.40	0.10	0.20	7.96	0.849	77.3	7.65	-2.35	-0.12	8.00
0.6	30.0	0.40	0.10	0.30	7.96	0.849	77.3	6.60	-2.07	-0.06	6.92
0.6	30.0	0.40	0.10	0.40	7.96	0.849	77.3	5.94	-1.88	-0.16	6.23
0.6	30.0	0.40	0.20	0.10	7.96	0.849	77.3	6.83	-1.03	-0.04	6.91
0.6	30.0	0.40	0.20	0.20	7.96	0.849	77.3	6.12	-1.00	-0.09	6.21
0.6	30.0	0.40	0.20	0.30	7.96	0.849	77.3	5.53	-1.04	-0.10	5.63
0.6	30.0	0.40	0.20	0.40	7.96	0.849	77.3	4.99	-0.98	-0.16	5.08
0.6	30.0	0.40	0.30	0.10	7.96	0.849	77.3	6.05	-0.67	-0.05	6.08
0.6	30.0	0.40	0.30	0.20	7.96	0.849	77.3	5.25	-0.57	-0.11	5.29
0.6	30.0	0.40	0.30	0.30	7.96	0.849	77.3	4.62	-0.52	-0.13	4.65
0.6	30.0	0.40	0.30	0.40	7.96	0.849	77.3	4.12	-0.50	-0.12	4.15
0.6	30.0	0.40	0.40	0.10	7.96	0.849	77.3	5.60	-0.48	-0.08	5.63
0.6	30.0	0.40	0.40	0.20	7.96	0.849	77.3	4.56	-0.37	-0.13	4.58
0.6	30.0	0.40	0.40	0.30	7.96	0.849	77.3	3.80	-0.30	-0.10	3.81
0.6	30.0	0.40	0.40	0.40	7.96	0.849	77.3	3.18	-0.27	-0.05	3.19
0.6	30.0	0.40	0.50	0.10	7.96	0.849	77.3	5.55	-0.32	-0.15	5.56

β	γ	τ	a/T	a/c	SCF	DoB	ϕ_{hs}	Y_{1a}	Y_{2a}	Y_{3a}	Y_{ea}
0.6	30.0	0.40	0.50	0.20	7.96	0.849	77.3	4.04	-0.32	-0.16	4.06
0.6	30.0	0.40	0.50	0.30	7.96	0.849	77.3	3.24	-0.23	-0.14	3.25
0.6	30.0	0.40	0.50	0.40	7.96	0.849	77.3	2.63	-0.17	-0.10	2.63
0.6	30.0	0.40	0.60	0.10	7.96	0.849	77.3	5.23	-0.36	-0.17	5.24
0.6	30.0	0.40	0.60	0.20	7.96	0.849	77.3	3.53	-0.36	-0.19	3.56
0.6	30.0	0.40	0.60	0.30	7.96	0.849	77.3	2.70	-0.26	-0.19	2.72
0.6	30.0	0.40	0.60	0.40	7.96	0.849	77.3	2.10	-0.19	-0.15	2.11
0.6	30.0	0.40	0.70	0.10	7.96	0.849	77.3	4.76	-0.57	-0.19	4.80
0.6	30.0	0.40	0.70	0.20	7.96	0.849	77.3	2.94	-0.49	-0.22	3.00
0.6	30.0	0.40	0.70	0.30	7.96	0.849	77.3	2.09	-0.36	-0.22	2.14
0.6	30.0	0.40	0.70	0.40	7.96	0.849	77.3	1.51	-0.25	-0.18	1.55
0.6	30.0	0.40	0.80	0.10	7.96	0.849	77.3	3.83	-1.18	-0.21	4.01
0.6	30.0	0.40	0.80	0.20	7.96	0.849	77.3	2.17	-0.67	-0.27	2.29
0.6	30.0	0.40	0.80	0.30	7.96	0.849	77.3	1.37	-0.48	-0.28	1.48
0.6	30.0	0.40	0.80	0.40	7.96	0.849	77.3	0.85	-0.34	-0.23	0.96
0.6	30.0	0.60	0.10	0.10	13.31	0.855	77.3	13.80	-3.70	0.08	14.28
0.6	30.0	0.60	0.10	0.20	13.31	0.855	77.3	12.77	-4.17	-0.13	13.44
0.6	30.0	0.60	0.10	0.30	13.31	0.855	77.3	11.11	-4.21	-0.02	11.89
0.6	30.0	0.60	0.10	0.40	13.31	0.855	77.3	9.81	-3.71	-0.16	10.49
0.6	30.0	0.60	0.20	0.10	13.31	0.855	77.3	10.85	-1.80	-0.01	11.00
0.6	30.0	0.60	0.20	0.20	13.31	0.855	77.3	9.87	-1.80	-0.06	10.03
0.6	30.0	0.60	0.20	0.30	13.31	0.855	77.3	8.94	-1.87	-0.14	9.14
0.6	30.0	0.60	0.20	0.40	13.31	0.855	77.3	8.12	-1.83	-0.24	8.33
0.6	30.0	0.60	0.30	0.10	13.31	0.855	77.3	9.54	-1.15	-0.07	9.61
0.6	30.0	0.60	0.30	0.20	13.31	0.855	77.3	8.27	-1.08	-0.19	8.34
0.6	30.0	0.60	0.30	0.30	13.31	0.855	77.3	7.37	-0.97	-0.18	7.43
0.6	30.0	0.60	0.30	0.40	13.31	0.855	77.3	6.60	-0.98	-0.24	6.68
0.6	30.0	0.60	0.40	0.10	13.31	0.855	77.3	8.79	-0.85	-0.14	8.83
0.6	30.0	0.60	0.40	0.20	13.31	0.855	77.3	7.13	-0.67	-0.19	7.16
0.6	30.0	0.60	0.40	0.30	13.31	0.855	77.3	6.02	-0.55	-0.15	6.05
0.6	30.0	0.60	0.40	0.40	13.31	0.855	77.3	5.09	-0.48	-0.09	5.12
0.6	30.0	0.60	0.50	0.10	13.31	0.855	77.3	8.51	-0.65	-0.25	8.54
0.6	30.0	0.60	0.50	0.20	13.31	0.855	77.3	6.27	-0.55	-0.26	6.30
0.6	30.0	0.60	0.50	0.30	13.31	0.855	77.3	5.10	-0.40	-0.24	5.13
0.6	30.0	0.60	0.50	0.40	13.31	0.855	77.3	4.21	-0.31	-0.18	4.22

β	γ	τ	a/T	a/c	SCF	DoB	ϕ_{hs}	Y_{1a}	Y_{2a}	Y_{3a}	Y_{ea}
0.6	30.0	0.60	0.60	0.10	13.31	0.855	77.3	7.88	-0.70	-0.28	7.92
0.6	30.0	0.60	0.60	0.20	13.31	0.855	77.3	5.39	-0.59	-0.32	5.43
0.6	30.0	0.60	0.60	0.30	13.31	0.855	77.3	4.18	-0.40	-0.31	4.21
0.6	30.0	0.60	0.60	0.40	13.31	0.855	77.3	3.30	-0.28	-0.26	3.32
0.6	30.0	0.60	0.70	0.10	13.31	0.855	77.3	7.04	-0.93	-0.34	7.11
0.6	30.0	0.60	0.70	0.20	13.31	0.855	77.3	4.40	-0.74	-0.39	4.49
0.6	30.0	0.60	0.70	0.30	13.31	0.855	77.3	3.19	-0.50	-0.38	3.26
0.6	30.0	0.60	0.70	0.40	13.31	0.855	77.3	2.34	-0.33	-0.34	2.40
0.6	30.0	0.60	0.80	0.10	13.31	0.855	77.3	5.53	-1.68	-0.37	5.80
0.6	30.0	0.60	0.80	0.20	13.31	0.855	77.3	3.17	-0.94	-0.46	3.35
0.6	30.0	0.60	0.80	0.30	13.31	0.855	77.3	2.06	-0.60	-0.45	2.22
0.6	30.0	0.60	0.80	0.40	13.31	0.855	77.3	1.28	-0.38	-0.40	1.42
0.6	30.0	0.80	0.10	0.10	18.84	0.862	77.3	19.01	-5.05	0.13	19.68
0.6	30.0	0.80	0.10	0.20	18.84	0.862	77.3	17.69	-5.71	-0.16	18.59
0.6	30.0	0.80	0.10	0.30	18.84	0.862	77.3	15.47	-5.66	-0.03	16.47
0.6	30.0	0.80	0.10	0.40	18.84	0.862	77.3	13.60	-5.08	-0.18	14.52
0.6	30.0	0.80	0.20	0.10	18.84	0.862	77.3	14.79	-2.46	-0.08	14.99
0.6	30.0	0.80	0.20	0.20	18.84	0.862	77.3	13.53	-2.44	-0.09	13.75
0.6	30.0	0.80	0.20	0.30	18.84	0.862	77.3	12.29	-2.55	-0.20	12.56
0.6	30.0	0.80	0.20	0.40	18.84	0.862	77.3	11.23	-2.53	-0.34	11.52
0.6	30.0	0.80	0.30	0.10	18.84	0.862	77.3	12.99	-1.65	-0.20	13.09
0.6	30.0	0.80	0.30	0.20	18.84	0.862	77.3	11.27	-1.43	-0.28	11.37
0.6	30.0	0.80	0.30	0.30	18.84	0.862	77.3	10.10	-1.31	-0.24	10.18
0.6	30.0	0.80	0.30	0.40	18.84	0.862	77.3	9.10	-1.34	-0.33	9.21
0.6	30.0	0.80	0.40	0.10	18.84	0.862	77.3	11.86	-1.11	-0.23	11.91
0.6	30.0	0.80	0.40	0.20	18.84	0.862	77.3	9.64	-0.86	-0.27	9.69
0.6	30.0	0.80	0.40	0.30	18.84	0.862	77.3	8.21	-0.70	-0.21	8.25
0.6	30.0	0.80	0.40	0.40	18.84	0.862	77.3	7.00	-0.61	-0.13	7.03
0.6	30.0	0.80	0.50	0.10	18.84	0.862	77.3	11.36	-0.87	-0.36	11.40
0.6	30.0	0.80	0.50	0.20	18.84	0.862	77.3	8.38	-0.71	-0.36	8.42
0.6	30.0	0.80	0.50	0.30	18.84	0.862	77.3	6.87	-0.51	-0.32	6.90
0.6	30.0	0.80	0.50	0.40	18.84	0.862	77.3	5.72	-0.38	-0.25	5.74
0.6	30.0	0.80	0.60	0.10	18.84	0.862	77.3	10.40	-0.93	-0.40	10.45
0.6	30.0	0.80	0.60	0.20	18.84	0.862	77.3	7.12	-0.74	-0.44	7.18
0.6	30.0	0.80	0.60	0.30	18.84	0.862	77.3	5.55	-0.49	-0.42	5.59
0.6	30.0	0.80	0.60	0.40	18.84	0.862	77.3	4.43	-0.33	-0.35	4.46

β	γ	τ	a/T	a/c	SCF	DoB	ϕ_{hs}	Y_{1a}	Y_{2a}	Y_{3a}	Y_{ea}
0.6	30.0	0.80	0.70	0.10	18.84	0.862	77.3	9.19	-1.22	-0.47	9.29
0.6	30.0	0.80	0.70	0.20	18.84	0.862	77.3	5.74	-0.91	-0.53	5.85
0.6	30.0	0.80	0.70	0.30	18.84	0.862	77.3	4.17	-0.62	-0.51	4.26
0.6	30.0	0.80	0.70	0.40	18.84	0.862	77.3	3.08	-0.39	-0.45	3.15
0.6	30.0	0.80	0.80	0.10	18.84	0.862	77.3	7.07	-2.07	-0.52	7.39
0.6	30.0	0.80	0.80	0.20	18.84	0.862	77.3	4.07	-1.13	-0.65	4.30
0.6	30.0	0.80	0.80	0.30	18.84	0.862	77.3	2.59	-0.74	-0.62	2.79
0.6	30.0	0.80	0.80	0.40	18.84	0.862	77.3	1.59	-0.48	-0.55	1.79
0.6	30.0	1.00	0.10	0.10	24.45	0.867	77.3	24.17	-6.11	0.08	24.93
0.6	30.0	1.00	0.10	0.20	24.45	0.867	77.3	22.66	-6.81	-0.24	23.67
0.6	30.0	1.00	0.10	0.30	24.45	0.867	77.3	19.98	-6.84	-0.08	21.12
0.6	30.0	1.00	0.10	0.40	24.45	0.867	77.3	17.68	-6.55	-0.11	18.85
0.6	30.0	1.00	0.20	0.10	24.45	0.867	77.3	18.67	-2.96	-0.19	18.91
0.6	30.0	1.00	0.20	0.20	24.45	0.867	77.3	17.15	-2.91	-0.16	17.40
0.6	30.0	1.00	0.20	0.30	24.45	0.867	77.3	15.65	-3.05	-0.30	15.95
0.6	30.0	1.00	0.20	0.40	24.45	0.867	77.3	14.33	-3.06	-0.46	14.66
0.6	30.0	1.00	0.30	0.10	24.45	0.867	77.3	16.33	-1.98	-0.34	16.46
0.6	30.0	1.00	0.30	0.20	24.45	0.867	77.3	14.22	-1.70	-0.40	14.32
0.6	30.0	1.00	0.30	0.30	24.45	0.867	77.3	12.81	-1.56	-0.35	12.91
0.6	30.0	1.00	0.30	0.40	24.45	0.867	77.3	11.59	-1.59	-0.44	11.71
0.6	30.0	1.00	0.40	0.10	24.45	0.867	77.3	14.75	-1.31	-0.33	14.81
0.6	30.0	1.00	0.40	0.20	24.45	0.867	77.3	12.05	-1.00	-0.36	12.10
0.6	30.0	1.00	0.40	0.30	24.45	0.867	77.3	10.33	-0.82	-0.27	10.37
0.6	30.0	1.00	0.40	0.40	24.45	0.867	77.3	8.91	-0.71	-0.18	8.94
0.6	30.0	1.00	0.50	0.10	24.45	0.867	77.3	14.01	-1.05	-0.48	14.06
0.6	30.0	1.00	0.50	0.20	24.45	0.867	77.3	10.35	-0.82	-0.47	10.40
0.6	30.0	1.00	0.50	0.30	24.45	0.867	77.3	8.56	-0.58	-0.41	8.60
0.6	30.0	1.00	0.50	0.40	24.45	0.867	77.3	7.19	-0.43	-0.31	7.21
0.6	30.0	1.00	0.60	0.10	24.45	0.867	77.3	12.72	-1.11	-0.53	12.79
0.6	30.0	1.00	0.60	0.20	24.45	0.867	77.3	8.70	-0.84	-0.58	8.77
0.6	30.0	1.00	0.60	0.30	24.45	0.867	77.3	6.83	-0.55	-0.52	6.88
0.6	30.0	1.00	0.60	0.40	24.45	0.867	77.3	5.49	-0.36	-0.43	5.53
0.6	30.0	1.00	0.70	0.10	24.45	0.867	77.3	11.16	-1.43	-0.60	11.27
0.6	30.0	1.00	0.70	0.20	24.45	0.867	77.3	6.95	-1.03	-0.68	7.07
0.6	30.0	1.00	0.70	0.30	24.45	0.867	77.3	5.05	-0.68	-0.63	5.15

β	γ	τ	a/T	a/c	SCF	DoB	ϕ_{hs}	Y_{1a}	Y_{2a}	Y_{3a}	Y_{ea}
0.6	30.0	1.00	0.70	0.40	24.45	0.867	77.3	3.76	-0.42	-0.55	3.84
0.6	30.0	1.00	0.80	0.10	24.45	0.867	77.3	8.68	-2.46	-0.66	9.05
0.6	30.0	1.00	0.80	0.20	24.45	0.867	77.3	4.87	-1.26	-0.82	5.12
0.6	30.0	1.00	0.80	0.30	24.45	0.867	77.3	3.06	-0.80	-0.76	3.29
0.6	30.0	1.00	0.80	0.40	24.45	0.867	77.3	1.85	-0.53	-0.67	2.08
0.6	35.0	0.20	0.10	0.10	3.50	0.826	61.5	3.62	-0.56	-0.18	3.67
0.6	35.0	0.20	0.10	0.20	3.50	0.826	61.5	2.98	-0.41	-0.14	3.02
0.6	35.0	0.20	0.10	0.30	3.50	0.826	61.5	2.19	-0.32	-0.16	2.22
0.6	35.0	0.20	0.10	0.40	3.50	0.826	61.5	1.92	-0.32	-0.15	1.96
0.6	35.0	0.20	0.20	0.10	3.50	0.826	61.5	3.28	-0.05	-0.09	3.28
0.6	35.0	0.20	0.20	0.20	3.50	0.826	61.5	2.79	-0.08	-0.08	2.79
0.6	35.0	0.20	0.20	0.30	3.50	0.826	61.5	2.34	-0.08	-0.06	2.34
0.6	35.0	0.20	0.20	0.40	3.50	0.826	61.5	1.97	-0.09	-0.04	1.97
0.6	35.0	0.20	0.30	0.10	3.50	0.826	61.5	3.06	0.03	-0.04	3.06
0.6	35.0	0.20	0.30	0.20	3.50	0.826	61.5	2.47	0.06	-0.06	2.47
0.6	35.0	0.20	0.30	0.30	3.50	0.826	61.5	2.05	0.05	-0.05	2.05
0.6	35.0	0.20	0.30	0.40	3.50	0.826	61.5	1.72	0.03	-0.03	1.72
0.6	35.0	0.20	0.40	0.10	3.50	0.826	61.5	3.02	0.10	-0.02	3.02
0.6	35.0	0.20	0.40	0.20	3.50	0.826	61.5	2.27	0.10	-0.01	2.27
0.6	35.0	0.20	0.40	0.30	3.50	0.826	61.5	1.79	0.12	-0.04	1.79
0.6	35.0	0.20	0.40	0.40	3.50	0.826	61.5	1.47	0.09	-0.03	1.47
0.6	35.0	0.20	0.50	0.10	3.50	0.826	61.5	2.97	0.10	-0.05	2.97
0.6	35.0	0.20	0.50	0.20	3.50	0.826	61.5	2.08	0.06	-0.07	2.08
0.6	35.0	0.20	0.50	0.30	3.50	0.826	61.5	1.54	0.11	-0.05	1.54
0.6	35.0	0.20	0.50	0.40	3.50	0.826	61.5	1.20	0.10	-0.04	1.20
0.6	35.0	0.20	0.60	0.10	3.50	0.826	61.5	2.94	0.03	-0.04	2.95
0.6	35.0	0.20	0.60	0.20	3.50	0.826	61.5	1.87	-0.03	-0.06	1.87
0.6	35.0	0.20	0.60	0.30	3.50	0.826	61.5	1.29	0.03	-0.08	1.29
0.6	35.0	0.20	0.60	0.40	3.50	0.826	61.5	0.91	0.05	-0.08	0.92
0.6	35.0	0.20	0.70	0.10	3.50	0.826	61.5	2.77	-0.13	-0.06	2.77
0.6	35.0	0.20	0.70	0.20	3.50	0.826	61.5	1.60	-0.13	-0.07	1.61
0.6	35.0	0.20	0.70	0.30	3.50	0.826	61.5	1.02	-0.05	-0.08	1.03
0.6	35.0	0.20	0.70	0.40	3.50	0.826	61.5	0.64	-0.01	-0.08	0.65
0.6	35.0	0.20	0.80	0.10	3.50	0.826	61.5	2.27	-0.49	-0.07	2.33
0.6	35.0	0.20	0.80	0.20	3.50	0.826	61.5	1.17	-0.28	-0.09	1.21

β	γ	τ	a/T	a/c	SCF	DoB	ϕ_{hs}	Y_{1a}	Y_{2a}	Y_{3a}	Y_{ea}
0.6	35.0	0.20	0.80	0.30	3.50	0.826	61.5	0.64	-0.16	-0.10	0.66
0.6	35.0	0.20	0.80	0.40	3.50	0.826	61.5	0.30	-0.08	-0.10	0.33
0.6	35.0	0.40	0.10	0.10	8.75	0.850	77.3	10.21	-2.16	-0.11	10.44
0.6	35.0	0.40	0.10	0.20	8.75	0.850	77.3	8.59	-1.86	-0.13	8.79
0.6	35.0	0.40	0.10	0.30	8.75	0.850	77.3	6.28	-1.45	-0.17	6.45
0.6	35.0	0.40	0.10	0.40	8.75	0.850	77.3	5.35	-1.20	-0.16	5.49
0.6	35.0	0.40	0.20	0.10	8.75	0.850	77.3	8.55	-0.89	-0.13	8.60
0.6	35.0	0.40	0.20	0.20	8.75	0.850	77.3	7.37	-0.86	-0.09	7.43
0.6	35.0	0.40	0.20	0.30	8.75	0.850	77.3	6.23	-0.80	-0.05	6.29
0.6	35.0	0.40	0.20	0.40	8.75	0.850	77.3	5.27	-0.73	-0.01	5.32
0.6	35.0	0.40	0.30	0.10	8.75	0.850	77.3	7.72	-0.58	-0.10	7.74
0.6	35.0	0.40	0.30	0.20	8.75	0.850	77.3	6.36	-0.36	-0.18	6.37
0.6	35.0	0.40	0.30	0.30	8.75	0.850	77.3	5.27	-0.33	-0.07	5.29
0.6	35.0	0.40	0.30	0.40	8.75	0.850	77.3	4.45	-0.38	-0.03	4.47
0.6	35.0	0.40	0.40	0.10	8.75	0.850	77.3	7.28	-0.38	-0.10	7.29
0.6	35.0	0.40	0.40	0.20	8.75	0.850	77.3	5.67	-0.17	-0.16	5.68
0.6	35.0	0.40	0.40	0.30	8.75	0.850	77.3	4.45	-0.07	-0.10	4.45
0.6	35.0	0.40	0.40	0.40	8.75	0.850	77.3	3.63	-0.11	-0.07	3.63
0.6	35.0	0.40	0.50	0.10	8.75	0.850	77.3	6.98	-0.27	-0.13	6.99
0.6	35.0	0.40	0.50	0.20	8.75	0.850	77.3	5.05	-0.13	-0.16	5.06
0.6	35.0	0.40	0.50	0.30	8.75	0.850	77.3	3.78	0.03	-0.20	3.79
0.6	35.0	0.40	0.50	0.40	8.75	0.850	77.3	2.85	0.02	-0.20	2.86
0.6	35.0	0.40	0.60	0.10	8.75	0.850	77.3	6.73	-0.28	-0.17	6.74
0.6	35.0	0.40	0.60	0.20	8.75	0.850	77.3	4.42	-0.21	-0.18	4.43
0.6	35.0	0.40	0.60	0.30	8.75	0.850	77.3	3.08	-0.03	-0.21	3.10
0.6	35.0	0.40	0.60	0.40	8.75	0.850	77.3	2.16	0.05	-0.22	2.17
0.6	35.0	0.40	0.70	0.10	8.75	0.850	77.3	5.99	-0.52	-0.20	6.02
0.6	35.0	0.40	0.70	0.20	8.75	0.850	77.3	3.63	-0.35	-0.20	3.65
0.6	35.0	0.40	0.70	0.30	8.75	0.850	77.3	2.31	-0.13	-0.24	2.33
0.6	35.0	0.40	0.70	0.40	8.75	0.850	77.3	1.39	-0.01	-0.25	1.42
0.6	35.0	0.40	0.80	0.10	8.75	0.850	77.3	4.83	-1.19	-0.20	4.98
0.6	35.0	0.40	0.80	0.20	8.75	0.850	77.3	2.51	-0.62	-0.23	2.60
0.6	35.0	0.40	0.80	0.30	8.75	0.850	77.3	1.39	-0.32	-0.25	1.46
0.6	35.0	0.40	0.80	0.40	8.75	0.850	77.3	0.61	-0.16	-0.27	0.71
0.6	35.0	0.60	0.10	0.10	14.71	0.856	77.3	16.85	-4.12	-0.12	17.35

β	γ	τ	a/T	a/c	SCF	DoB	ϕ_{hs}	Y_{1a}	Y_{2a}	Y_{3a}	Y_{ea}
0.6	35.0	0.60	0.10	0.20	14.71	0.856	77.3	14.32	-3.80	-0.16	14.81
0.6	35.0	0.60	0.10	0.30	14.71	0.856	77.3	10.41	-3.39	-0.19	10.95
0.6	35.0	0.60	0.10	0.40	14.71	0.856	77.3	8.84	-3.05	-0.12	9.35
0.6	35.0	0.60	0.20	0.10	14.71	0.856	77.3	13.75	-1.73	-0.23	13.86
0.6	35.0	0.60	0.20	0.20	14.71	0.856	77.3	11.96	-1.72	-0.12	12.08
0.6	35.0	0.60	0.20	0.30	14.71	0.856	77.3	10.08	-1.60	-0.07	10.21
0.6	35.0	0.60	0.20	0.40	14.71	0.856	77.3	8.51	-1.58	0.00	8.65
0.6	35.0	0.60	0.30	0.10	14.71	0.856	77.3	12.26	-1.04	-0.21	12.31
0.6	35.0	0.60	0.30	0.20	14.71	0.856	77.3	10.16	-0.78	-0.31	10.19
0.6	35.0	0.60	0.30	0.30	14.71	0.856	77.3	8.50	-0.71	-0.14	8.53
0.6	35.0	0.60	0.30	0.40	14.71	0.856	77.3	7.15	-0.75	-0.07	7.18
0.6	35.0	0.60	0.40	0.10	14.71	0.856	77.3	11.42	-0.74	-0.24	11.44
0.6	35.0	0.60	0.40	0.20	14.71	0.856	77.3	8.97	-0.39	-0.29	8.98
0.6	35.0	0.60	0.40	0.30	14.71	0.856	77.3	7.13	-0.25	-0.19	7.13
0.6	35.0	0.60	0.40	0.40	14.71	0.856	77.3	5.85	-0.26	-0.15	5.86
0.6	35.0	0.60	0.50	0.10	14.71	0.856	77.3	10.73	-0.63	-0.25	10.76
0.6	35.0	0.60	0.50	0.20	14.71	0.856	77.3	7.88	-0.30	-0.30	7.90
0.6	35.0	0.60	0.50	0.30	14.71	0.856	77.3	6.00	-0.03	-0.35	6.02
0.6	35.0	0.60	0.50	0.40	14.71	0.856	77.3	4.58	0.01	-0.34	4.60
0.6	35.0	0.60	0.60	0.10	14.71	0.856	77.3	10.03	-0.67	-0.30	10.06
0.6	35.0	0.60	0.60	0.20	14.71	0.856	77.3	6.78	-0.36	-0.33	6.80
0.6	35.0	0.60	0.60	0.30	14.71	0.856	77.3	4.87	-0.04	-0.37	4.89
0.6	35.0	0.60	0.60	0.40	14.71	0.856	77.3	3.49	0.09	-0.37	3.52
0.6	35.0	0.60	0.70	0.10	14.71	0.856	77.3	8.95	-0.88	-0.34	9.01
0.6	35.0	0.60	0.70	0.20	14.71	0.856	77.3	5.47	-0.51	-0.38	5.51
0.6	35.0	0.60	0.70	0.30	14.71	0.856	77.3	3.62	-0.15	-0.41	3.66
0.6	35.0	0.60	0.70	0.40	14.71	0.856	77.3	2.34	0.02	-0.40	2.38
0.6	35.0	0.60	0.80	0.10	14.71	0.856	77.3	6.95	-1.79	-0.38	7.19
0.6	35.0	0.60	0.80	0.20	14.71	0.856	77.3	3.81	-0.85	-0.42	3.93
0.6	35.0	0.60	0.80	0.30	14.71	0.856	77.3	2.19	-0.39	-0.44	2.29
0.6	35.0	0.60	0.80	0.40	14.71	0.856	77.3	1.02	-0.16	-0.44	1.16
0.6	35.0	0.80	0.10	0.10	20.86	0.863	77.3	23.28	-5.81	-0.17	23.99
0.6	35.0	0.80	0.10	0.20	20.86	0.863	77.3	20.33	-5.38	-0.18	21.03
0.6	35.0	0.80	0.10	0.30	20.86	0.863	77.3	14.78	-4.98	-0.22	15.60
0.6	35.0	0.80	0.10	0.40	20.86	0.863	77.3	12.40	-4.64	-0.12	13.24

β	γ	τ	a/T	a/c	SCF	DoB	ϕ_{hs}	Y_{1a}	Y_{2a}	Y_{3a}	Y_{ea}
0.6	35.0	0.80	0.20	0.10	20.86	0.863	77.3	18.91	-2.34	-0.36	19.06
0.6	35.0	0.80	0.20	0.20	20.86	0.863	77.3	16.46	-2.41	-0.20	16.63
0.6	35.0	0.80	0.20	0.30	20.86	0.863	77.3	14.09	-2.25	-0.11	14.27
0.6	35.0	0.80	0.20	0.40	20.86	0.863	77.3	11.92	-2.08	-0.03	12.10
0.6	35.0	0.80	0.30	0.10	20.86	0.863	77.3	16.71	-1.43	-0.36	16.78
0.6	35.0	0.80	0.30	0.20	20.86	0.863	77.3	13.94	-1.02	-0.47	13.99
0.6	35.0	0.80	0.30	0.30	20.86	0.863	77.3	11.76	-0.98	-0.23	11.81
0.6	35.0	0.80	0.30	0.40	20.86	0.863	77.3	10.00	-0.97	-0.13	10.05
0.6	35.0	0.80	0.40	0.10	20.86	0.863	77.3	15.44	-1.00	-0.42	15.48
0.6	35.0	0.80	0.40	0.20	20.86	0.863	77.3	12.22	-0.52	-0.45	12.24
0.6	35.0	0.80	0.40	0.30	20.86	0.863	77.3	9.86	-0.31	-0.30	9.87
0.6	35.0	0.80	0.40	0.40	20.86	0.863	77.3	8.21	-0.30	-0.24	8.22
0.6	35.0	0.80	0.50	0.10	20.86	0.863	77.3	14.40	-0.86	-0.39	14.44
0.6	35.0	0.80	0.50	0.20	20.86	0.863	77.3	10.66	-0.37	-0.46	10.68
0.6	35.0	0.80	0.50	0.30	20.86	0.863	77.3	8.25	0.00	-0.52	8.27
0.6	35.0	0.80	0.50	0.40	20.86	0.863	77.3	6.44	0.09	-0.50	6.47
0.6	35.0	0.80	0.60	0.10	20.86	0.863	77.3	13.32	-0.90	-0.43	13.36
0.6	35.0	0.80	0.60	0.20	20.86	0.863	77.3	8.97	-0.44	-0.49	9.00
0.6	35.0	0.80	0.60	0.30	20.86	0.863	77.3	6.60	0.00	-5.50	6.63
0.6	35.0	0.80	0.60	0.40	20.86	0.863	77.3	4.87	0.18	-0.54	4.92
0.6	35.0	0.80	0.70	0.10	20.86	0.863	77.3	11.75	-1.16	-0.49	11.82
0.6	35.0	0.80	0.70	0.20	20.86	0.863	77.3	7.12	-0.63	-0.56	7.18
0.6	35.0	0.80	0.70	0.30	20.86	0.863	77.3	4.82	-0.15	-0.59	4.87
0.6	35.0	0.80	0.70	0.40	20.86	0.863	77.3	3.19	0.12	-0.56	3.27
0.6	35.0	0.80	0.80	0.10	20.86	0.863	77.3	8.97	-2.05	-0.53	9.23
0.6	35.0	0.80	0.80	0.20	20.86	0.863	77.3	4.78	-0.96	-0.62	4.93
0.6	35.0	0.80	0.80	0.30	20.86	0.863	77.3	2.68	-0.42	-0.63	2.82
0.6	35.0	0.80	0.80	0.40	20.86	0.863	77.3	1.25	-0.11	-0.61	1.45
0.6	35.0	1.00	0.10	0.10	27.11	0.869	77.3	29.88	-6.99	-0.27	30.69
0.6	35.0	1.00	0.10	0.20	27.11	0.869	77.3	26.18	-6.78	-0.29	27.05
0.6	35.0	1.00	0.10	0.30	27.11	0.869	77.3	19.36	-6.22	-0.32	20.33
0.6	35.0	1.00	0.10	0.40	27.11	0.869	77.3	15.98	-5.76	-0.19	16.99
0.6	35.0	1.00	0.20	0.10	27.11	0.869	77.3	23.98	-2.82	-0.55	24.16
0.6	35.0	1.00	0.20	0.20	27.11	0.869	77.3	21.16	-2.83	-0.31	21.35
0.6	35.0	1.00	0.20	0.30	27.11	0.869	77.3	18.20	-2.73	-0.21	18.40
0.6	35.0	1.00	0.20	0.40	27.11	0.869	77.3	15.42	-2.62	-0.10	15.64

β	γ	τ	a/T	a/c	SCF	DoB	ϕ_{hs}	Y_{1a}	Y_{2a}	Y_{3a}	Y_{ea}
0.6	35.0	1.00	0.30	0.10	27.11	0.869	77.3	21.12	-1.70	-0.57	21.20
0.6	35.0	1.00	0.30	0.20	27.11	0.869	77.3	17.77	-1.16	-0.64	17.82
0.6	35.0	1.00	0.30	0.30	27.11	0.869	77.3	15.20	-1.12	-0.34	15.25
0.6	35.0	1.00	0.30	0.40	27.11	0.869	77.3	12.97	-1.16	-0.23	13.02
0.6	35.0	1.00	0.40	0.10	27.11	0.869	77.3	19.40	-1.17	-0.63	19.45
0.6	35.0	1.00	0.40	0.20	27.11	0.869	77.3	15.44	-0.58	-0.61	15.47
0.6	35.0	1.00	0.40	0.30	27.11	0.869	77.3	12.66	-0.32	-0.41	12.68
0.6	35.0	1.00	0.40	0.40	27.11	0.869	77.3	10.61	-0.32	-0.34	10.62
0.6	35.0	1.00	0.50	0.10	27.11	0.869	77.3	17.92	-1.03	-0.52	17.96
0.6	35.0	1.00	0.50	0.20	27.11	0.869	77.3	13.28	-0.42	-0.62	13.31
0.6	35.0	1.00	0.50	0.30	27.11	0.869	77.3	10.39	0.04	-0.67	10.43
0.6	35.0	1.00	0.50	0.40	27.11	0.869	77.3	8.23	0.17	-0.64	8.27
0.6	35.0	1.00	0.60	0.10	27.11	0.869	77.3	16.44	-1.08	-0.56	16.49
0.6	35.0	1.00	0.60	0.20	27.11	0.869	77.3	11.10	-0.49	-0.65	11.14
0.6	35.0	1.00	0.60	0.30	27.11	0.869	77.3	8.24	0.05	-0.71	8.28
0.6	35.0	1.00	0.60	0.40	27.11	0.869	77.3	6.13	0.29	-0.68	6.19
0.6	35.0	1.00	0.70	0.10	27.11	0.869	77.3	14.39	-1.36	-0.63	14.47
0.6	35.0	1.00	0.70	0.20	27.11	0.869	77.3	8.68	-0.68	-0.72	8.75
0.6	35.0	1.00	0.70	0.30	27.11	0.869	77.3	5.90	-0.11	-0.75	5.96
0.6	35.0	1.00	0.70	0.40	27.11	0.869	77.3	3.93	0.21	-0.72	4.03
0.6	35.0	1.00	0.80	0.10	27.11	0.869	77.3	11.11	-2.46	-0.67	11.41
0.6	35.0	1.00	0.80	0.20	27.11	0.869	77.3	5.71	-1.07	-0.81	5.89
0.6	35.0	1.00	0.80	0.30	27.11	0.869	77.3	3.15	-0.42	-0.80	3.32
0.6	35.0	1.00	0.80	0.40	27.11	0.869	77.3	1.41	-0.07	-0.76	1.68
0.8	10.0	0.30	0.10	0.10	2.07	0.727	41.3	1.88	-0.34	-0.10	1.92
0.8	10.0	0.30	0.10	0.20	2.07	0.727	41.3	1.72	-0.34	-0.08	1.75
0.8	10.0	0.30	0.10	0.30	2.07	0.727	41.3	1.52	-0.36	-0.09	1.56
0.8	10.0	0.30	0.10	0.40	2.07	0.727	41.3	1.36	-0.36	-0.08	1.41
0.8	10.0	0.30	0.13	0.20	2.07	0.727	41.3	1.64	-0.30	-0.08	1.67
0.8	10.0	0.30	0.20	0.10	2.07	0.727	41.3	1.74	-0.27	-0.08	1.76
0.8	10.0	0.30	0.20	0.20	2.07	0.727	41.3	1.53	-0.26	-0.08	1.55
0.8	10.0	0.30	0.20	0.30	2.07	0.727	41.3	1.38	-0.26	-0.09	1.41
0.8	10.0	0.30	0.20	0.40	2.07	0.727	41.3	1.26	-0.25	-0.06	1.28
0.8	10.0	0.30	0.30	0.10	2.07	0.727	41.3	---	---	---	---

β	γ	τ	a/T	a/c	SCF	DoB	ϕ_{hs}	Y_{1a}	Y_{2a}	Y_{3a}	Y_{ea}
0.8	10.0	0.30	0.30	0.20	2.07	0.727	41.3	1.45	-0.23	-0.05	1.47
0.8	10.0	0.30	0.30	0.30	2.07	0.727	41.3	1.26	-0.23	-0.06	1.29
0.8	10.0	0.30	0.30	0.40	2.07	0.727	41.3	1.12	-0.22	-0.09	1.15
0.8	10.0	0.30	0.40	0.10	2.07	0.727	41.3	---	---	---	---
0.8	10.0	0.30	0.40	0.20	2.07	0.727	41.3	1.34	-0.22	-0.10	1.36
0.8	10.0	0.30	0.40	0.30	2.07	0.727	41.3	1.15	-0.21	-0.10	1.17
0.8	10.0	0.30	0.40	0.40	2.07	0.727	41.3	1.01	-0.20	-0.09	1.03
0.8	10.0	0.30	0.50	0.10	2.07	0.727	41.3	---	---	---	---
0.8	10.0	0.30	0.50	0.20	2.07	0.727	41.3	---	---	---	---
0.8	10.0	0.30	0.50	0.30	2.07	0.727	41.3	1.07	-0.19	-0.10	1.09
0.8	10.0	0.30	0.50	0.40	2.07	0.727	41.3	0.91	-0.18	-0.10	0.94
0.8	10.0	0.30	0.60	0.10	2.07	0.727	41.3	---	---	---	---
0.8	10.0	0.30	0.60	0.20	2.07	0.727	41.3	---	---	---	---
0.8	10.0	0.30	0.60	0.30	2.07	0.727	41.3	1.01	-0.18	-0.11	1.04
0.8	10.0	0.30	0.60	0.40	2.07	0.727	41.3	0.84	-0.17	-0.10	0.87
0.8	10.0	0.30	0.70	0.10	2.07	0.727	41.3	---	---	---	---
0.8	10.0	0.30	0.70	0.20	2.07	0.727	41.3	---	---	---	---
0.8	10.0	0.30	0.70	0.30	2.07	0.727	41.3	---	---	---	---
0.8	10.0	0.30	0.70	0.40	2.07	0.727	41.3	0.71	-0.19	-0.11	0.74
0.8	10.0	0.30	0.80	0.10	2.07	0.727	41.3	---	---	---	---
0.8	10.0	0.30	0.80	0.20	2.07	0.727	41.3	---	---	---	---
0.8	10.0	0.30	0.80	0.30	2.07	0.727	41.3	---	---	---	---
0.8	10.0	0.30	0.80	0.40	2.07	0.727	41.3	0.57	-0.21	-0.11	0.62
0.8	10.0	0.65	0.10	0.10	4.71	0.747	41.3	4.45	-0.84	-0.22	4.54
0.8	10.0	0.65	0.10	0.20	4.71	0.747	41.3	4.11	-0.84	-0.17	4.20
0.8	10.0	0.65	0.10	0.30	4.71	0.747	41.3	3.71	-0.86	-0.20	3.81
0.8	10.0	0.65	0.10	0.40	4.71	0.747	41.3	3.34	-0.86	-0.19	3.45
0.8	10.0	0.65	0.13	0.20	4.71	0.747	41.3	3.83	-0.70	-0.18	3.90
0.8	10.0	0.65	0.20	0.10	4.71	0.747	41.3	3.89	-0.61	-0.20	3.95
0.8	10.0	0.65	0.20	0.20	4.71	0.747	41.3	3.47	-0.57	-0.19	3.52
0.8	10.0	0.65	0.20	0.30	4.71	0.747	41.3	3.17	-0.56	-0.17	3.22
0.8	10.0	0.65	0.20	0.40	4.71	0.747	41.3	2.91	-0.55	-0.14	2.97
0.8	10.0	0.65	0.30	0.10	4.71	0.747	41.3	---	---	---	---
0.8	10.0	0.65	0.30	0.20	4.71	0.747	41.3	3.17	-0.50	-0.14	3.21
0.8	10.0	0.65	0.30	0.30	4.71	0.747	41.3	2.81	-0.49	-0.11	2.86

β	γ	τ	a/T	a/c	SCF	DoB	ϕ_{hs}	Y_{1a}	Y_{2a}	Y_{3a}	Y_{ea}
0.8	10.0	0.65	0.30	0.40	4.71	0.747	41.3	2.54	-0.45	-0.17	2.58
0.8	10.0	0.65	0.40	0.10	4.71	0.747	41.3	---	---	---	---
0.8	10.0	0.65	0.40	0.20	4.71	0.747	41.3	2.91	-0.43	-0.26	2.96
0.8	10.0	0.65	0.40	0.30	4.71	0.747	41.3	2.51	-0.40	-0.25	2.56
0.8	10.0	0.65	0.40	0.40	4.71	0.747	41.3	2.24	-0.37	-0.23	2.28
0.8	10.0	0.65	0.50	0.10	4.71	0.747	41.3	---	---	---	---
0.8	10.0	0.65	0.50	0.20	4.71	0.747	41.3	---	---	---	---
0.8	10.0	0.65	0.50	0.30	4.71	0.747	41.3	2.29	-0.37	-0.27	2.34
0.8	10.0	0.65	0.50	0.40	4.71	0.747	41.3	1.98	-0.34	-0.25	2.03
0.8	10.0	0.65	0.60	0.10	4.71	0.747	41.3	---	---	---	---
0.8	10.0	0.65	0.60	0.20	4.71	0.747	41.3	---	---	---	---
0.8	10.0	0.65	0.60	0.30	4.71	0.747	41.3	2.07	-0.36	-0.29	2.13
0.8	10.0	0.65	0.60	0.40	4.71	0.747	41.3	1.74	-0.33	-0.27	1.80
0.8	10.0	0.65	0.70	0.10	4.71	0.747	41.3	---	---	---	---
0.8	10.0	0.65	0.70	0.20	4.71	0.747	41.3	---	---	---	---
0.8	10.0	0.65	0.70	0.30	4.71	0.747	41.3	---	---	---	---
0.8	10.0	0.65	0.70	0.40	4.71	0.747	41.3	1.47	-0.34	-0.30	1.55
0.8	10.0	0.65	0.80	0.10	4.71	0.747	41.3	---	---	---	---
0.8	10.0	0.65	0.80	0.20	4.71	0.747	41.3	---	---	---	---
0.8	10.0	0.65	0.80	0.30	4.71	0.747	41.3	---	---	---	---
0.8	10.0	0.65	0.80	0.40	4.71	0.747	41.3	1.18	-0.35	-0.33	1.29
0.8	10.0	1.00	0.10	0.10	7.41	0.761	44.6	7.00	-1.13	-0.36	7.10
0.8	10.0	1.00	0.10	0.20	7.41	0.761	44.6	6.50	-1.12	-0.27	6.61
0.8	10.0	1.00	0.10	0.30	7.41	0.761	44.6	5.94	-1.14	-0.31	6.06
0.8	10.0	1.00	0.10	0.40	7.41	0.761	44.6	5.39	-1.16	-0.29	5.53
0.8	10.0	1.00	0.13	0.20	7.41	0.761	44.6	6.02	-0.95	-0.29	6.10
0.8	10.0	1.00	0.20	0.10	7.41	0.761	44.6	5.99	-0.85	-0.32	6.06
0.8	10.0	1.00	0.20	0.20	7.41	0.761	44.6	5.38	-0.78	-0.31	5.45
0.8	10.0	1.00	0.20	0.30	7.41	0.761	44.6	4.94	-0.76	-0.27	5.01
0.8	10.0	1.00	0.20	0.40	7.41	0.761	44.6	4.56	-0.76	-0.23	4.63
0.8	10.0	1.00	0.30	0.10	7.41	0.761	44.6	---	---	---	---
0.8	10.0	1.00	0.30	0.20	7.41	0.761	44.6	4.83	-0.70	-0.23	4.89
0.8	10.0	1.00	0.30	0.30	7.41	0.761	44.6	4.32	-0.65	-0.25	4.38
0.8	10.0	1.00	0.30	0.40	7.41	0.761	44.6	3.92	-0.62	-0.28	3.98

β	γ	τ	a/T	a/c	SCF	DoB	ϕ_{hs}	Y_{1a}	Y_{2a}	Y_{3a}	Y_{ea}
0.8	10.0	1.00	0.40	0.10	7.41	0.761	44.6	---	---	---	---
0.8	10.0	1.00	0.40	0.20	7.41	0.761	44.6	4.37	-0.61	-0.42	4.45
0.8	10.0	1.00	0.40	0.30	7.41	0.761	44.6	3.81	-0.56	-0.40	3.88
0.8	10.0	1.00	0.40	0.40	7.41	0.761	44.6	3.40	-0.52	-0.37	3.47
0.8	10.0	1.00	0.50	0.10	7.41	0.761	44.6	---	---	---	---
0.8	10.0	1.00	0.50	0.20	7.41	0.761	44.6	---	---	---	---
0.8	10.0	1.00	0.50	0.30	7.41	0.761	44.6	3.41	-0.52	-0.43	3.49
0.8	10.0	1.00	0.50	0.40	7.41	0.761	44.6	2.97	-0.48	-0.40	3.05
0.8	10.0	1.00	0.60	0.10	7.41	0.761	44.6	---	---	---	---
0.8	10.0	1.00	0.60	0.20	7.41	0.761	44.6	---	---	---	---
0.8	10.0	1.00	0.60	0.30	7.41	0.761	44.6	3.04	-0.51	-0.47	3.13
0.8	10.0	1.00	0.60	0.40	7.41	0.761	44.6	2.56	-0.46	-0.44	2.66
0.8	10.0	1.00	0.70	0.10	7.41	0.761	44.6	---	---	---	---
0.8	10.0	1.00	0.70	0.20	7.41	0.761	44.6	---	---	---	---
0.8	10.0	1.00	0.70	0.30	7.41	0.761	44.6	---	---	---	---
0.8	10.0	1.00	0.70	0.40	7.41	0.761	44.6	2.14	-0.46	-0.48	2.26
0.8	10.0	1.00	0.80	0.10	7.41	0.761	44.6	---	---	---	---
0.8	10.0	1.00	0.80	0.20	7.41	0.761	44.6	---	---	---	---
0.8	10.0	1.00	0.80	0.30	7.41	0.761	44.6	---	---	---	---
0.8	10.0	1.00	0.80	0.40	7.41	0.761	44.6	1.67	-0.46	-0.54	1.85
0.8	15.0	0.30	0.10	0.10	2.51	0.770	54.1	2.59	-0.47	-0.10	2.64
0.8	15.0	0.30	0.10	0.20	2.51	0.770	54.1	2.37	-0.50	-0.08	2.43
0.8	15.0	0.30	0.10	0.30	2.51	0.770	54.1	1.99	-0.56	-0.09	2.07
0.8	15.0	0.30	0.10	0.40	2.51	0.770	54.1	1.73	-0.55	-0.09	1.82
0.8	15.0	0.30	0.20	0.10	2.51	0.770	54.1	2.26	-0.34	-0.09	2.29
0.8	15.0	0.30	0.20	0.20	2.51	0.770	54.1	2.05	-0.31	-0.08	2.07
0.8	15.0	0.30	0.20	0.30	2.51	0.770	54.1	1.85	-0.33	-0.05	1.88
0.8	15.0	0.30	0.20	0.40	2.51	0.770	54.1	1.64	-0.33	-0.04	1.68
0.8	15.0	0.30	0.30	0.10	2.51	0.770	54.1	2.15	-0.31	-0.07	2.17
0.8	15.0	0.30	0.30	0.20	2.51	0.770	54.1	1.85	-0.27	-0.07	1.87
0.8	15.0	0.30	0.30	0.30	2.51	0.770	54.1	1.64	-0.25	-0.06	1.66
0.8	15.0	0.30	0.30	0.40	2.51	0.770	54.1	1.47	-0.25	-0.04	1.49
0.8	15.0	0.30	0.40	0.10	2.51	0.770	54.1	---	---	---	---
0.8	15.0	0.30	0.40	0.20	2.51	0.770	54.1	1.70	-0.23	-0.10	1.72
0.8	15.0	0.30	0.40	0.30	2.51	0.770	54.1	1.44	-0.20	-0.10	1.46
0.8	15.0	0.30	0.40	0.40	2.51	0.770	54.1	1.22	-0.19	-0.09	1.23

β	γ	τ	a/T	a/c	SCF	DoB	ϕ_{hs}	Y_{1a}	Y_{2a}	Y_{3a}	Y_{ea}
0.8	15.0	0.30	0.50	0.10	2.51	0.770	54.1	---	---	---	---
0.8	15.0	0.30	0.50	0.20	2.51	0.770	54.1	1.60	-0.21	-0.10	1.62
0.8	15.0	0.30	0.50	0.30	2.51	0.770	54.1	1.29	-0.19	-0.10	1.31
0.8	15.0	0.30	0.50	0.40	2.51	0.770	54.1	1.07	-0.17	-0.09	1.09
0.8	15.0	0.30	0.60	0.10	2.51	0.770	54.1	---	---	---	---
0.8	15.0	0.30	0.60	0.20	2.51	0.770	54.1	1.49	-0.22	-0.11	1.51
0.8	15.0	0.30	0.60	0.30	2.51	0.770	54.1	1.15	-0.20	-0.10	1.18
0.8	15.0	0.30	0.60	0.40	2.51	0.770	54.1	0.91	-0.18	-0.10	0.94
0.8	15.0	0.30	0.70	0.10	2.51	0.770	54.1	---	---	---	---
0.8	15.0	0.30	0.70	0.20	2.51	0.770	54.1	---	---	---	---
0.8	15.0	0.30	0.70	0.30	2.51	0.770	54.1	0.97	-0.23	-0.11	1.01
0.8	15.0	0.30	0.70	0.40	2.51	0.770	54.1	0.73	-0.20	-0.11	0.77
0.8	15.0	0.30	0.80	0.10	2.51	0.770	54.1	---	---	---	---
0.8	15.0	0.30	0.80	0.20	2.51	0.770	54.1	---	---	---	---
0.8	15.0	0.30	0.80	0.30	2.51	0.770	54.1	0.73	-0.28	-0.12	0.79
0.8	15.0	0.30	0.80	0.40	2.51	0.770	54.1	0.52	-0.24	-0.11	0.59
0.8	15.0	0.65	0.10	0.10	6.33	0.800	54.1	6.93	-1.37	-0.19	7.07
0.8	15.0	0.65	0.10	0.20	6.33	0.800	54.1	6.42	-1.36	-0.17	6.56
0.8	15.0	0.65	0.10	0.30	6.33	0.800	54.1	5.55	-1.49	-0.19	5.75
0.8	15.0	0.65	0.10	0.40	6.33	0.800	54.1	4.87	-1.47	-0.18	5.09
0.8	15.0	0.65	0.20	0.10	6.33	0.800	54.1	5.83	-0.86	-0.21	5.90
0.8	15.0	0.65	0.20	0.20	6.33	0.800	54.1	5.30	-0.81	-0.18	5.37
0.8	15.0	0.65	0.20	0.30	6.33	0.800	54.1	4.83	-0.84	-0.11	4.91
0.8	15.0	0.65	0.20	0.40	6.33	0.800	54.1	4.38	-0.85	-0.08	4.46
0.8	15.0	0.65	0.30	0.10	6.33	0.800	54.1	5.40	-0.71	-0.20	5.45
0.8	15.0	0.65	0.30	0.20	6.33	0.800	54.1	4.64	-0.65	-0.14	4.69
0.8	15.0	0.65	0.30	0.30	6.33	0.800	54.1	4.17	-0.62	-0.13	4.22
0.8	15.0	0.65	0.30	0.40	6.33	0.800	54.1	3.76	-0.64	-0.02	3.82
0.8	15.0	0.65	0.40	0.10	6.33	0.800	54.1	---	---	---	---
0.8	15.0	0.65	0.40	0.20	6.33	0.800	54.1	4.19	-0.54	-0.26	4.24
0.8	15.0	0.65	0.40	0.30	6.33	0.800	54.1	3.57	-0.48	-0.27	3.62
0.8	15.0	0.65	0.40	0.40	6.33	0.800	54.1	3.09	-0.46	-0.26	3.14
0.8	15.0	0.65	0.50	0.10	6.33	0.800	54.1	---	---	---	---
0.8	15.0	0.65	0.50	0.20	6.33	0.800	54.1	3.82	-0.51	-0.29	3.87
0.8	15.0	0.65	0.50	0.30	6.33	0.800	54.1	3.14	-0.44	-0.28	3.19

β	γ	τ	a/T	a/c	SCF	DoB	ϕ_{hs}	Y_{1a}	Y_{2a}	Y_{3a}	Y_{ea}
0.8	15.0	0.65	0.50	0.40	6.33	0.800	54.1	2.64	-0.40	-0.28	2.69
0.8	15.0	0.65	0.60	0.10	6.33	0.800	54.1	---	---	---	---
0.8	15.0	0.65	0.60	0.20	6.33	0.800	54.1	3.43	-0.51	-0.31	3.49
0.8	15.0	0.65	0.60	0.30	6.33	0.800	54.1	2.69	-0.44	-0.31	2.75
0.8	15.0	0.65	0.60	0.40	6.33	0.800	54.1	2.18	-0.39	-0.30	2.25
0.8	15.0	0.65	0.70	0.10	6.33	0.800	54.1	---	---	---	---
0.8	15.0	0.65	0.70	0.20	6.33	0.800	54.1	---	---	---	---
0.8	15.0	0.65	0.70	0.30	6.33	0.800	54.1	2.18	-0.46	-0.34	2.26
0.8	15.0	0.65	0.70	0.40	6.33	0.800	54.1	1.69	-0.41	-0.33	1.78
0.8	15.0	0.65	0.80	0.10	6.33	0.800	54.1	---	---	---	---
0.8	15.0	0.65	0.80	0.20	6.33	0.800	54.1	---	---	---	---
0.8	15.0	0.65	0.80	0.30	6.33	0.800	54.1	1.55	-0.53	-0.37	1.70
0.8	15.0	0.65	0.80	0.40	6.33	0.800	54.1	1.10	-0.45	-0.36	1.27
0.8	15.0	1.00	0.10	0.10	10.16	0.811	54.1	11.39	-1.88	-0.37	11.56
0.8	15.0	1.00	0.10	0.20	10.16	0.811	54.1	10.58	-1.92	-0.32	10.76
0.8	15.0	1.00	0.10	0.30	10.16	0.811	54.1	9.33	-2.11	-0.32	9.57
0.8	15.0	1.00	0.10	0.40	10.16	0.811	54.1	8.26	-2.11	-0.30	8.54
0.8	15.0	1.00	0.20	0.10	10.16	0.811	54.1	9.43	-1.25	-0.37	9.52
0.8	15.0	1.00	0.20	0.20	10.16	0.811	54.1	8.61	-1.16	-0.32	8.69
0.8	15.0	1.00	0.20	0.30	10.16	0.811	54.1	7.90	-1.19	-0.21	7.99
0.8	15.0	1.00	0.20	0.40	10.16	0.811	54.1	7.20	-1.23	-0.18	7.31
0.8	15.0	1.00	0.30	0.10	10.16	0.811	54.1	8.60	-1.06	-0.41	8.67
0.8	15.0	1.00	0.30	0.20	10.16	0.811	54.1	7.42	-0.94	-0.25	7.49
0.8	15.0	1.00	0.30	0.30	10.16	0.811	54.1	6.71	-0.90	-0.24	6.78
0.8	15.0	1.00	0.30	0.40	10.16	0.811	54.1	6.10	-0.94	-0.08	6.17
0.8	15.0	1.00	0.40	0.10	10.16	0.811	54.1	---	---	---	---
0.8	15.0	1.00	0.40	0.20	10.16	0.811	54.1	6.60	-0.79	-0.45	6.67
0.8	15.0	1.00	0.40	0.30	10.16	0.811	54.1	5.68	-0.70	-0.46	5.75
0.8	15.0	1.00	0.40	0.40	10.16	0.811	54.1	4.94	-0.67	-0.46	5.02
0.8	15.0	1.00	0.50	0.10	10.16	0.811	54.1	---	---	---	---
0.8	15.0	1.00	0.50	0.20	10.16	0.811	54.1	5.91	-0.74	-0.48	5.99
0.8	15.0	1.00	0.50	0.30	10.16	0.811	54.1	4.90	-0.64	-0.49	4.98
0.8	15.0	1.00	0.50	0.40	10.16	0.811	54.1	4.15	-0.58	-0.48	4.23
0.8	15.0	1.00	0.60	0.10	10.16	0.811	54.1	---	---	---	---
0.8	15.0	1.00	0.60	0.20	10.16	0.811	54.1	5.23	-0.73	-0.51	5.32

β	γ	τ	a/T	a/c	SCF	DoB	ϕ_{hs}	Y_{1a}	Y_{2a}	Y_{3a}	Y_{ea}
0.8	15.0	1.00	0.60	0.30	10.16	0.811	54.1	4.11	-0.61	-0.52	4.20
0.8	15.0	1.00	0.60	0.40	10.16	0.811	54.1	3.36	-0.55	-0.51	3.46
0.8	15.0	1.00	0.70	0.10	10.16	0.811	54.1	---	---	---	---
0.8	15.0	1.00	0.70	0.20	10.16	0.811	54.1	---	---	---	---
0.8	15.0	1.00	0.70	0.30	10.16	0.811	54.1	3.26	-0.62	-0.57	3.38
0.8	15.0	1.00	0.70	0.40	10.16	0.811	54.1	2.53	-0.55	-0.55	2.67
0.8	15.0	1.00	0.80	0.10	10.16	0.811	54.1	---	---	---	---
0.8	15.0	1.00	0.80	0.20	10.16	0.811	54.1	---	---	---	---
0.8	15.0	1.00	0.80	0.30	10.16	0.811	54.1	2.25	-0.67	-0.62	2.47
0.8	15.0	1.00	0.80	0.40	10.16	0.811	54.1	1.57	-0.58	-0.60	1.82
0.8	20.0	0.30	0.10	0.10	3.06	0.792	58.3	3.03	-0.54	-0.26	3.09
0.8	20.0	0.30	0.10	0.20	3.06	0.792	58.3	2.60	-0.56	-0.25	2.68
0.8	20.0	0.30	0.10	0.30	3.06	0.792	58.3	2.21	-0.47	-0.24	2.28
0.8	20.0	0.30	0.10	0.40	3.06	0.792	58.3	1.97	-0.45	-0.24	2.04
0.8	20.0	0.30	0.20	0.10	3.06	0.792	58.3	2.57	-0.26	-0.19	2.59
0.8	20.0	0.30	0.20	0.20	3.06	0.792	58.3	2.31	-0.28	-0.20	2.34
0.8	20.0	0.30	0.20	0.30	3.06	0.792	58.3	2.05	-0.28	-0.18	2.08
0.8	20.0	0.30	0.20	0.40	3.06	0.792	58.3	1.82	-0.23	-0.21	1.85
0.8	20.0	0.30	0.27	0.20	3.06	0.792	58.3	2.12	-0.20	-0.17	2.14
0.8	20.0	0.30	0.30	0.10	3.06	0.792	58.3	2.38	-0.23	-0.14	2.40
0.8	20.0	0.30	0.30	0.20	3.06	0.792	58.3	2.04	-0.18	-0.16	2.06
0.8	20.0	0.30	0.30	0.30	3.06	0.792	58.3	1.82	-0.17	-0.16	1.84
0.8	20.0	0.30	0.30	0.40	3.06	0.792	58.3	1.60	-0.16	-0.13	1.61
0.8	20.0	0.30	0.40	0.10	3.06	0.792	58.3	2.39	-0.24	-0.08	2.40
0.8	20.0	0.30	0.40	0.20	3.06	0.792	58.3	1.84	-0.16	-0.14	1.85
0.8	20.0	0.30	0.40	0.30	3.06	0.792	58.3	1.60	-0.12	-0.13	1.61
0.8	20.0	0.30	0.40	0.40	3.06	0.792	58.3	1.39	-0.11	-0.12	1.41
0.8	20.0	0.30	0.50	0.10	3.06	0.792	58.3	---	---	---	---
0.8	20.0	0.30	0.50	0.20	3.06	0.792	58.3	1.66	-0.15	-0.11	1.67
0.8	20.0	0.30	0.50	0.30	3.06	0.792	58.3	1.32	-0.11	-0.08	1.33
0.8	20.0	0.30	0.50	0.40	3.06	0.792	58.3	1.06	-0.11	-0.06	1.07
0.8	20.0	0.30	0.60	0.10	3.06	0.792	58.3	---	---	---	---
0.8	20.0	0.30	0.60	0.20	3.06	0.792	58.3	1.51	-0.17	-0.11	1.53
0.8	20.0	0.30	0.60	0.30	3.06	0.792	58.3	1.14	-0.14	-0.08	1.15
0.8	20.0	0.30	0.60	0.40	3.06	0.792	58.3	0.88	-0.11	-0.05	0.89

β	γ	τ	a/T	a/c	SCF	DoB	ϕ_{hs}	Y_{1a}	Y_{2a}	Y_{3a}	Y_{ea}
0.8	20.0	0.30	0.70	0.10	3.06	0.792	58.3	---	---	---	---
0.8	20.0	0.30	0.70	0.20	3.06	0.792	58.3	1.30	-0.21	-0.10	1.33
0.8	20.0	0.30	0.70	0.30	3.06	0.792	58.3	0.91	-0.17	-0.08	0.94
0.8	20.0	0.30	0.70	0.40	3.06	0.792	58.3	0.66	-0.14	-0.05	0.68
0.8	20.0	0.30	0.80	0.10	3.06	0.792	58.3	---	---	---	---
0.8	20.0	0.30	0.80	0.20	3.06	0.792	58.3	1.04	-0.31	-0.09	1.09
0.8	20.0	0.30	0.80	0.30	3.06	0.792	58.3	0.64	-0.24	-0.08	0.69
0.8	20.0	0.30	0.80	0.40	3.06	0.792	58.3	0.41	-0.19	-0.06	0.46
0.8	20.0	0.65	0.10	0.10	8.04	0.825	73.4	9.29	-1.92	-0.47	9.50
0.8	20.0	0.65	0.10	0.20	8.04	0.825	73.4	8.37	-1.98	-0.43	8.62
0.8	20.0	0.65	0.10	0.30	8.04	0.825	73.4	7.08	-2.11	-0.23	7.40
0.8	20.0	0.65	0.10	0.40	8.04	0.825	73.4	6.19	-1.77	-0.42	6.46
0.8	20.0	0.65	0.20	0.10	8.04	0.825	73.4	7.62	-0.90	-0.34	7.68
0.8	20.0	0.65	0.20	0.20	8.04	0.825	73.4	6.94	-0.95	-0.40	7.03
0.8	20.0	0.65	0.20	0.30	8.04	0.825	73.4	6.24	-1.00	-0.36	6.33
0.8	20.0	0.65	0.20	0.40	8.04	0.825	73.4	5.55	-0.91	-0.45	5.65
0.8	20.0	0.65	0.27	0.20	8.04	0.825	73.4	6.22	-0.70	-0.36	6.27
0.8	20.0	0.65	0.30	0.10	8.04	0.825	73.4	6.91	-0.74	-0.29	6.95
0.8	20.0	0.65	0.30	0.20	8.04	0.825	73.4	5.91	-0.62	-0.35	5.95
0.8	20.0	0.65	0.30	0.30	8.04	0.825	73.4	5.29	-0.58	-0.30	5.33
0.8	20.0	0.65	0.30	0.40	8.04	0.825	73.4	4.77	-0.56	-0.35	4.82
0.8	20.0	0.65	0.40	0.10	8.04	0.825	73.4	6.62	-0.72	-0.15	6.67
0.8	20.0	0.65	0.40	0.20	8.04	0.825	73.4	5.22	-0.46	-0.27	5.25
0.8	20.0	0.65	0.40	0.30	8.04	0.825	73.4	4.52	-0.42	-0.32	4.55
0.8	20.0	0.65	0.40	0.40	8.04	0.825	73.4	4.03	-0.37	-0.33	4.07
0.8	20.0	0.65	0.50	0.10	8.04	0.825	73.4	---	---	---	---
0.8	20.0	0.65	0.50	0.20	8.04	0.825	73.4	4.66	-0.43	-0.26	4.69
0.8	20.0	0.65	0.50	0.30	8.04	0.825	73.4	3.74	-0.34	-0.23	3.76
0.8	20.0	0.65	0.50	0.40	8.04	0.825	73.4	3.11	-0.31	-0.16	3.13
0.8	20.0	0.65	0.60	0.10	8.04	0.825	73.4	---	---	---	---
0.8	20.0	0.65	0.60	0.20	8.04	0.825	73.4	4.03	-0.45	-0.29	4.07
0.8	20.0	0.65	0.60	0.30	8.04	0.825	73.4	3.10	-0.35	-0.24	3.13
0.8	20.0	0.65	0.60	0.40	8.04	0.825	73.4	2.45	-0.29	-0.16	2.48
0.8	20.0	0.65	0.70	0.10	8.04	0.825	73.4	---	---	---	---

β	γ	τ	a/T	a/c	SCF	DoB	ϕ_{hs}	Y_{1a}	Y_{2a}	Y_{3a}	Y_{ea}
0.8	20.0	0.65	0.70	0.20	8.04	0.825	73.4	3.31	-0.50	-0.28	3.37
0.8	20.0	0.65	0.70	0.30	8.04	0.825	73.4	2.39	-0.40	-0.24	2.44
0.8	20.0	0.65	0.70	0.40	8.04	0.825	73.4	1.76	-0.31	-0.17	1.80
0.8	20.0	0.65	0.80	0.10	8.04	0.825	73.4	---	---	---	---
0.8	20.0	0.65	0.80	0.20	8.04	0.825	73.4	2.45	-0.67	-0.29	2.56
0.8	20.0	0.65	0.80	0.30	8.04	0.825	73.4	1.55	-0.50	-0.25	1.66
0.8	20.0	0.65	0.80	0.40	8.04	0.825	73.4	0.98	-0.39	-0.19	1.08
0.8	20.0	1.00	0.10	0.10	13.55	0.834	73.4	15.74	-3.00	-0.85	16.05
0.8	20.0	1.00	0.10	0.20	13.55	0.834	73.4	14.44	-2.99	-0.77	14.77
0.8	20.0	1.00	0.10	0.30	13.55	0.834	73.4	12.56	-3.25	-0.44	12.99
0.8	20.0	1.00	0.10	0.40	13.55	0.834	73.4	11.02	-3.12	-0.33	11.46
0.8	20.0	1.00	0.20	0.10	13.55	0.834	73.4	12.70	-1.37	-0.61	12.79
0.8	20.0	1.00	0.20	0.20	13.55	0.834	73.4	11.64	-1.48	-0.68	11.77
0.8	20.0	1.00	0.20	0.30	13.55	0.834	73.4	10.53	-1.55	-0.61	10.67
0.8	20.0	1.00	0.20	0.40	13.55	0.834	73.4	9.50	-1.54	-0.49	9.64
0.8	20.0	1.00	0.27	0.20	13.55	0.834	73.4	10.34	-1.08	-0.64	10.43
0.8	20.0	1.00	0.30	0.10	13.55	0.834	73.4	11.37	-1.12	-0.50	11.44
0.8	20.0	1.00	0.30	0.20	13.55	0.834	73.4	9.79	-0.94	-0.62	9.86
0.8	20.0	1.00	0.30	0.30	13.55	0.834	73.4	8.83	-0.87	-0.50	8.89
0.8	20.0	1.00	0.30	0.40	13.55	0.834	73.4	8.03	-0.89	-0.61	8.11
0.8	20.0	1.00	0.40	0.10	13.55	0.834	73.4	10.50	-0.98	-0.53	10.57
0.8	20.0	1.00	0.40	0.20	13.55	0.834	73.4	8.49	-0.71	-0.53	8.55
0.8	20.0	1.00	0.40	0.30	13.55	0.834	73.4	7.25	-0.59	-0.37	7.29
0.8	20.0	1.00	0.40	0.40	13.55	0.834	73.4	6.23	-0.60	-0.25	6.26
0.8	20.0	1.00	0.50	0.10	13.55	0.834	73.4	---	---	---	---
0.8	20.0	1.00	0.50	0.20	13.55	0.834	73.4	7.40	-0.64	-0.52	7.45
0.8	20.0	1.00	0.50	0.30	13.55	0.834	73.4	6.08	-0.48	-0.38	6.11
0.8	20.0	1.00	0.50	0.40	13.55	0.834	73.4	5.10	-0.45	-0.27	5.13
0.8	20.0	1.00	0.60	0.10	13.55	0.834	73.4	---	---	---	---
0.8	20.0	1.00	0.60	0.20	13.55	0.834	73.4	6.32	-0.64	-0.50	6.38
0.8	20.0	1.00	0.60	0.30	13.55	0.834	73.4	4.92	-0.47	-0.40	4.97
0.8	20.0	1.00	0.60	0.40	13.55	0.834	73.4	3.94	-0.39	-0.27	3.97
0.8	20.0	1.00	0.70	0.10	13.55	0.834	73.4	---	---	---	---
0.8	20.0	1.00	0.70	0.20	13.55	0.834	73.4	5.10	-0.67	-0.49	5.17
0.8	20.0	1.00	0.70	0.30	13.55	0.834	73.4	3.69	-0.52	-0.41	3.76

β	γ	τ	a/T	a/c	SCF	DoB	ϕ_{hs}	Y_{1a}	Y_{2a}	Y_{3a}	Y_{ea}
0.8	20.0	1.00	0.70	0.40	13.55	0.834	73.4	2.75	-0.40	-0.29	2.80
0.8	20.0	1.00	0.80	0.10	13.55	0.834	73.4	---	---	---	---
0.8	20.0	1.00	0.80	0.20	13.55	0.834	73.4	3.68	-0.85	-0.50	3.82
0.8	20.0	1.00	0.80	0.30	13.55	0.834	73.4	2.30	-0.61	-0.42	2.44
0.8	20.0	1.00	0.80	0.40	13.55	0.834	73.4	1.45	-0.47	-0.32	1.57

APPENDIX E

COMPARISON OF SIF RESULTS WITH SIMPLIFIED METHODS

Table E1

Comparison with Simplified Methods for a/c=0.1

β	γ	τ	a/T	SCF	DoB	FEM Y_{1a}	Ho's Y_{1a}	Ho's Diff	BSI's Y_{1a}	BSI's Diff	Mod. Y_{1a}	Mod. Diff
0.6	10.0	0.20	0.10	1.61	0.765	1.34	1.85	38%	1.60	19%	1.48	10.6%
0.6	10.0	0.20	0.20	1.61	0.765	1.26	1.74	38%	1.41	12%	1.22	-3.5%
0.6	10.0	0.40	0.10	3.46	0.780	3.20	3.98	24%	3.63	14%	3.36	5.1%
0.6	10.0	0.40	0.20	3.46	0.780	2.83	3.74	32%	3.14	11%	2.70	-4.7%
0.6	10.0	0.60	0.10	5.38	0.790	5.14	6.19	20%	5.87	14%	5.43	5.6%
0.6	10.0	0.60	0.20	5.38	0.790	4.40	5.82	32%	5.01	14%	4.29	-2.5%
0.6	10.0	0.80	0.10	7.30	0.797	7.01	8.40	20%	8.10	16%	7.49	6.9%
0.6	10.0	0.80	0.20	7.30	0.797	5.88	7.90	34%	6.87	17%	5.88	-0.0%
0.6	10.0	1.00	0.10	9.17	0.802	8.78	10.55	20%	10.26	17%	9.49	8.1%
0.6	10.0	1.00	0.20	9.17	0.802	7.28	9.92	36%	8.68	19%	7.42	2.0%
0.6	15.0	0.20	0.10	2.08	0.819	1.92	2.39	25%	2.04	7%	1.88	-1.9%
0.6	15.0	0.20	0.20	2.08	0.819	1.76	2.25	28%	1.78	1%	1.51	-14.0%
0.6	15.0	0.20	0.30	2.08	0.819	1.72	2.11	23%	1.67	-3%	1.31	-24.0%
0.6	15.0	0.20	0.40	2.08	0.819	1.69	1.96	16%	1.63	-4%	1.18	-30.3%
0.6	15.0	0.30	0.10	3.32	0.804	3.34	3.82	14%	3.38	1%	3.12	-6.6%
0.6	15.0	0.30	0.20	3.32	0.804	2.95	3.59	22%	2.93	-1%	2.50	-15.3%
0.6	15.0	0.30	0.30	3.32	0.804	2.86	3.36	18%	2.74	-4%	2.16	-24.5%
0.6	15.0	0.30	0.40	3.32	0.804	2.61	3.13	20%	2.67	2%	1.96	-25.1%
0.6	15.0	0.50	0.10	6.06	0.817	6.36	6.98	10%	6.45	1%	5.94	-6.6%
0.6	15.0	0.50	0.20	6.06	0.817	5.39	6.56	22%	5.50	2%	4.67	-13.3%
0.6	15.0	0.50	0.30	6.06	0.817	5.07	6.14	21%	5.09	0%	3.99	-21.3%
0.6	15.0	0.50	0.40	6.06	0.817	4.95	5.72	16%	4.91	-1%	3.57	-28.0%
0.6	15.0	0.65	0.10	8.27	0.836	8.61	9.52	11%	8.99	5%	8.27	-3.9%
0.6	15.0	0.65	0.20	8.27	0.836	7.18	8.95	25%	7.59	6%	6.41	-10.7%

β	γ	τ	a/T	SCF	DoB	FEM Y_{1a}	Ho's Y_{1a}	Ho's Diff	BSI's Y_{1a}	BSI's Diff	Mod. Y_{1a}	Mod. Diff
0.6	15.0	0.65	0.30	8.27	0.836	6.68	8.38	25%	6.95	4%	5.40	-19.1%
0.6	15.0	0.65	0.40	8.27	0.836	6.49	7.81	20%	6.66	3%	4.77	-26.6%
0.6	15.0	0.80	0.10	10.51	0.841	10.82	12.10	12%	11.51	6%	10.59	-2.1%
0.6	15.0	0.80	0.20	10.51	0.841	8.92	11.37	27%	9.68	9%	8.18	-8.3%
0.6	15.0	0.80	0.30	10.51	0.841	8.25	10.65	29%	8.86	7%	6.87	-16.8%
0.6	15.0	0.80	0.40	10.51	0.841	7.97	9.92	24%	8.46	6%	6.04	-24.2%
0.6	15.0	1.00	0.10	13.45	0.846	13.71	15.48	13%	14.83	8%	13.64	-0.5%
0.6	15.0	1.00	0.20	13.45	0.846	11.17	14.55	30%	12.44	11%	10.50	-6.0%
0.6	15.0	1.00	0.30	13.45	0.846	10.26	13.62	33%	11.35	11%	8.79	-14.3%
0.6	15.0	1.00	0.40	13.45	0.846	9.86	12.70	29%	10.83	10%	7.71	-21.8%
0.6	20.0	0.20	0.10	2.51	0.812	2.40	2.89	20%	2.47	3%	2.28	-5.1%
0.6	20.0	0.20	0.20	2.51	0.812	2.30	2.72	18%	2.16	-6%	1.84	-20.2%
0.6	20.0	0.20	0.30	2.51	0.812	2.10	2.54	21%	2.03	-4%	1.59	-24.3%
0.6	20.0	0.20	0.40	2.51	0.812	2.05	2.37	16%	1.98	-4%	1.44	-29.8%
0.6	20.0	0.20	0.50	2.51	0.812	2.06	2.20	7%	1.98	-4%	1.34	-34.7%
0.6	20.0	0.40	0.10	5.89	0.831	6.28	6.78	8%	6.12	-3%	5.63	-10.4%
0.6	20.0	0.40	0.20	5.89	0.831	5.28	6.37	21%	5.24	-1%	4.43	-16.1%
0.6	20.0	0.40	0.30	5.89	0.831	4.95	5.97	21%	4.84	-2%	3.77	-23.9%
0.6	20.0	0.40	0.40	5.89	0.831	4.77	5.56	17%	4.67	-2%	3.35	-29.7%
0.6	20.0	0.40	0.50	5.89	0.831	4.70	5.15	10%	4.62	-2%	3.08	-34.5%
0.6	20.0	0.60	0.10	9.74	0.847	10.20	11.21	10%	10.48	3%	9.62	-5.7%
0.6	20.0	0.60	0.20	9.74	0.847	8.36	10.54	26%	8.84	6%	7.45	-10.9%
0.6	20.0	0.60	0.30	9.74	0.847	7.70	9.87	28%	8.09	5%	6.25	-18.9%
0.6	20.0	0.60	0.40	9.74	0.847	7.34	9.19	25%	7.74	5%	5.48	-25.3%
0.6	20.0	0.60	0.50	9.74	0.847	7.14	8.52	19%	7.59	6%	4.97	-30.4%
0.6	20.0	0.80	0.10	13.71	0.853	14.01	15.78	13%	14.97	7%	13.75	-1.9%
0.6	20.0	0.80	0.20	13.71	0.853	11.38	14.83	30%	12.56	10%	10.57	-7.1%
0.6	20.0	0.80	0.30	13.71	0.853	10.37	13.89	34%	11.46	11%	8.83	-14.9%
0.6	20.0	0.80	0.40	13.71	0.853	9.82	12.94	32%	10.92	11%	7.71	-21.5%
0.6	20.0	0.80	0.50	13.71	0.853	9.46	12.00	27%	10.67	13%	6.94	-26.6%
0.6	20.0	1.00	0.10	17.68	0.858	17.75	20.35	15%	19.42	9%	17.83	0.5%
0.6	20.0	1.00	0.20	17.68	0.858	14.31	19.13	34%	16.25	14%	13.67	-4.5%
0.6	20.0	1.00	0.30	17.68	0.858	12.94	17.91	38%	14.79	14%	11.38	-12.0%
0.6	20.0	1.00	0.40	17.68	0.858	12.17	16.69	37%	14.07	16%	9.91	-18.6%
0.6	20.0	1.00	0.50	17.68	0.858	11.64	15.47	33%	13.73	18%	8.89	-23.6%
0.6	25.0	0.20	0.10	2.91	0.821	2.80	3.35	20%	2.86	2%	2.63	-6.0%
0.6	25.0	0.20	0.20	2.91	0.821	2.45	3.15	29%	2.49	2%	2.11	-13.7%
0.6	25.0	0.20	0.30	2.91	0.821	2.29	2.95	29%	2.34	2%	1.82	-20.3%
0.6	25.0	0.20	0.40	2.91	0.821	2.30	2.75	19%	2.27	-1%	1.64	-28.5%
0.6	25.0	0.20	0.50	2.91	0.821	2.26	2.55	13%	2.27	0%	1.53	-32.4%
0.6	25.0	0.20	0.60	2.91	0.821	2.23	2.35	5%	2.29	3%	1.46	-34.6%

β	γ	τ	a/T	SCF	DoB	FEM Y_{1a}	Ho's Y_{1a}	Ho's Diff	BSI's Y_{1a}	BSI's Diff	Mod. Y_{1a}	Mod. Diff
0.6	25.0	0.40	0.10	7.00	0.847	7.50	8.06	7%	7.24	-3%	6.65	-11.3%
0.6	25.0	0.40	0.20	7.00	0.847	6.17	7.57	23%	6.18	0%	5.20	-15.7%
0.6	25.0	0.40	0.30	7.00	0.847	5.58	7.09	27%	5.70	2%	4.39	-21.3%
0.6	25.0	0.40	0.40	7.00	0.847	5.42	6.61	22%	5.47	1%	3.87	-28.5%
0.6	25.0	0.40	0.50	7.00	0.847	5.20	6.13	18%	5.39	4%	3.52	-32.3%
0.6	25.0	0.40	0.60	7.00	0.847	4.99	5.64	13%	5.38	8%	3.28	-34.2%
0.6	25.0	0.60	0.10	11.67	0.853	12.20	13.43	10%	12.54	3%	11.50	-5.7%
0.6	25.0	0.60	0.20	11.67	0.853	9.78	12.63	29%	10.56	8%	8.88	-9.2%
0.6	25.0	0.60	0.30	11.67	0.853	8.75	11.82	35%	9.66	10%	7.43	-15.1%
0.6	25.0	0.60	0.40	11.67	0.853	8.40	11.02	31%	9.22	10%	6.50	-22.6%
0.6	25.0	0.60	0.50	11.67	0.853	7.97	10.21	28%	9.03	13%	5.86	-26.4%
0.6	25.0	0.60	0.60	11.67	0.853	7.50	9.41	25%	8.97	20%	5.42	-27.7%
0.6	25.0	0.80	0.10	16.48	0.859	16.75	18.97	13%	17.96	7%	16.48	-1.6%
0.6	25.0	0.80	0.20	16.48	0.859	13.29	17.83	34%	15.05	13%	12.64	-4.9%
0.6	25.0	0.80	0.30	16.48	0.859	11.85	16.69	41%	13.71	16%	10.53	-11.1%
0.6	25.0	0.80	0.40	16.48	0.859	11.26	15.56	38%	13.05	16%	9.17	-18.6%
0.6	25.0	0.80	0.50	16.48	0.859	10.58	14.42	36%	12.73	20%	8.22	-22.3%
0.6	25.0	0.80	0.60	16.48	0.859	9.86	13.28	35%	12.61	28%	7.56	-23.4%
0.6	25.0	1.00	0.10	21.33	0.864	21.24	24.55	16%	23.38	10%	21.45	1.0%
0.6	25.0	1.00	0.20	21.33	0.864	16.75	23.08	38%	19.54	17%	16.41	-2.0%
0.6	25.0	1.00	0.30	21.33	0.864	14.85	21.61	46%	17.77	20%	13.62	-8.3%
0.6	25.0	1.00	0.40	21.33	0.864	13.97	20.14	44%	16.88	21%	11.82	-15.4%
0.6	25.0	1.00	0.50	21.33	0.864	13.03	18.66	43%	16.44	26%	10.56	-18.9%
0.6	25.0	1.00	0.60	21.33	0.864	12.05	17.19	43%	16.23	35%	9.66	-19.8%
0.6	30.0	0.20	0.10	3.23	0.825	3.06	3.72	21%	3.17	4%	2.92	-4.6%
0.6	30.0	0.20	0.20	3.23	0.825	2.64	3.49	32%	2.76	5%	2.34	-11.3%
0.6	30.0	0.20	0.30	3.23	0.825	2.44	3.27	34%	2.59	6%	2.02	-17.4%
0.6	30.0	0.20	0.40	3.23	0.825	2.33	3.05	31%	2.51	8%	1.81	-22.2%
0.6	30.0	0.20	0.50	3.23	0.825	2.37	2.83	19%	2.51	6%	1.68	-29.1%
0.6	30.0	0.20	0.60	3.23	0.825	2.32	2.60	12%	2.53	9%	1.60	-31.0%
0.6	30.0	0.20	0.70	3.23	0.825	2.18	2.38	9%	2.58	18%	1.57	-28.2%
0.6	30.0	0.20	0.80	3.23	0.825	1.81	2.16	19%	2.63	45%	1.58	-12.9%
0.6	30.0	0.40	0.10	7.96	0.849	8.45	9.16	8%	8.23	-3%	7.56	-10.6%
0.6	30.0	0.40	0.20	7.96	0.849	6.83	8.61	26%	7.02	3%	5.91	-13.5%
0.6	30.0	0.40	0.30	7.96	0.849	6.05	8.06	33%	6.47	7%	4.98	-17.6%
0.6	30.0	0.40	0.40	7.96	0.849	5.60	7.51	34%	6.21	11%	4.39	-21.6%
0.6	30.0	0.40	0.50	7.96	0.849	5.55	6.97	25%	6.11	10%	3.99	-28.2%
0.6	30.0	0.40	0.60	7.96	0.849	5.23	6.42	23%	6.10	17%	3.71	-29.1%
0.6	30.0	0.40	0.70	7.96	0.849	4.76	5.87	23%	6.13	29%	3.54	-25.6%
0.6	30.0	0.40	0.80	7.96	0.849	3.83	5.32	39%	6.17	61%	3.48	-9.0%
0.6	30.0	0.60	0.10	13.31	0.855	13.80	15.32	11%	14.29	4%	13.11	-5.0%
0.6	30.0	0.60	0.20	13.31	0.855	10.85	14.40	33%	12.04	11%	10.11	-6.8%

β	γ	τ	a/T	SCF	DoB	FEM Y_{1a}	Ho's Y_{1a}	Ho's Diff	BSI's Y_{1a}	BSI's Diff	Mod. Y_{1a}	Mod. Diff
0.6	30.0	0.60	0.30	13.31	0.855	9.54	13.48	41%	11.00	15%	8.46	-11.4%
0.6	30.0	0.60	0.40	13.31	0.855	8.79	12.56	43%	10.50	19%	7.39	-15.9%
0.6	30.0	0.60	0.50	13.31	0.855	8.51	11.65	37%	10.27	21%	6.65	-21.8%
0.6	30.0	0.60	0.60	13.31	0.855	7.88	10.73	36%	10.20	29%	6.14	-22.0%
0.6	30.0	0.60	0.70	13.31	0.855	7.04	9.81	39%	10.19	45%	5.82	-17.3%
0.6	30.0	0.60	0.80	13.31	0.855	5.53	8.89	61%	10.22	85%	5.68	2.6%
0.6	30.0	0.80	0.10	18.84	0.862	19.01	21.68	14%	20.51	8%	18.82	-1.0%
0.6	30.0	0.80	0.20	18.84	0.862	14.79	20.38	38%	17.18	16%	14.42	-2.5%
0.6	30.0	0.80	0.30	18.84	0.862	12.99	19.08	47%	15.64	20%	11.99	-7.7%
0.6	30.0	0.80	0.40	18.84	0.862	11.86	17.78	50%	14.87	25%	10.42	-12.1%
0.6	30.0	0.80	0.50	18.84	0.862	11.36	16.49	45%	14.50	28%	9.33	-17.9%
0.6	30.0	0.80	0.60	18.84	0.862	10.40	15.19	46%	14.34	38%	8.55	-17.8%
0.6	30.0	0.80	0.70	18.84	0.862	9.19	13.89	51%	14.28	55%	8.03	-12.6%
0.6	30.0	0.80	0.80	18.84	0.862	7.07	12.59	78%	14.26	102%	7.77	9.9%
0.6	30.0	1.00	0.10	24.45	0.867	24.17	28.14	16%	26.77	11%	24.55	1.6%
0.6	30.0	1.00	0.20	24.45	0.867	18.67	26.45	42%	22.37	20%	18.76	0.5%
0.6	30.0	1.00	0.30	24.45	0.867	16.33	24.77	52%	20.32	25%	15.56	-4.7%
0.6	30.0	1.00	0.40	24.45	0.867	14.75	23.08	56%	19.29	31%	13.47	-8.7%
0.6	30.0	1.00	0.50	24.45	0.867	14.01	21.39	53%	18.77	34%	12.01	-14.3%
0.6	30.0	1.00	0.60	24.45	0.867	12.72	19.71	55%	18.52	46%	10.96	-13.9%
0.6	30.0	1.00	0.70	24.45	0.867	11.16	18.02	61%	18.39	65%	10.23	-8.3%
0.6	30.0	1.00	0.80	24.45	0.867	8.68	16.33	88%	18.30	111%	9.83	13.3%
0.6	35.0	0.20	0.10	3.50	0.826	3.62	4.03	11%	3.44	-5%	3.16	-12.7%
0.6	35.0	0.20	0.20	3.50	0.826	3.28	3.79	15%	2.99	-9%	2.53	-22.7%
0.6	35.0	0.20	0.30	3.50	0.826	3.06	3.55	16%	2.80	-9%	2.18	-28.7%
0.6	35.0	0.20	0.40	3.50	0.826	3.02	3.30	9%	2.72	-10%	1.96	-35.1%
0.6	35.0	0.20	0.50	3.50	0.826	2.97	3.06	3%	2.71	-9%	1.82	-38.8%
0.6	35.0	0.20	0.60	3.50	0.826	2.94	2.82	-4%	2.74	-7%	1.73	-41.2%
0.6	35.0	0.20	0.70	3.50	0.826	2.77	2.58	-7%	2.79	1%	1.69	-39.0%
0.6	35.0	0.20	0.80	3.50	0.826	2.27	2.34	3%	2.85	25%	1.70	-25.1%
0.6	35.0	0.40	0.10	8.75	0.850	10.21	10.07	-1%	9.05	-11%	8.30	-18.7%
0.6	35.0	0.40	0.20	8.75	0.850	8.55	9.47	11%	7.72	-10%	6.49	-24.1%
0.6	35.0	0.40	0.30	8.75	0.850	7.72	8.86	15%	7.11	-8%	5.47	-29.1%
0.6	35.0	0.40	0.40	8.75	0.850	7.28	8.26	13%	6.82	-6%	4.82	-33.8%
0.6	35.0	0.40	0.50	8.75	0.850	6.98	7.66	10%	6.71	-4%	4.37	-37.4%
0.6	35.0	0.40	0.60	8.75	0.850	6.73	7.05	5%	6.69	-1%	4.06	-39.6%
0.6	35.0	0.40	0.70	8.75	0.850	5.99	6.45	8%	6.72	12%	3.88	-35.3%
0.6	35.0	0.40	0.80	8.75	0.850	4.83	5.85	21%	6.77	40%	3.81	-21.1%
0.6	35.0	0.60	0.10	14.71	0.856	16.85	16.93	0%	15.79	-6%	14.49	-14.0%
0.6	35.0	0.60	0.20	14.71	0.856	13.75	15.92	16%	13.30	-3%	11.17	-18.8%
0.6	35.0	0.60	0.30	14.71	0.856	12.26	14.90	22%	12.15	-1%	9.33	-23.9%
0.6	35.0	0.60	0.40	14.71	0.856	11.42	13.89	22%	11.59	2%	8.15	-28.6%

β	γ	τ	a/T	SCF	DoB	FEM Y_{1a}	Ho's Y_{1a}	Ho's Diff	BSI's Y_{1a}	BSI's Diff	Mod. Y_{1a}	Mod. Diff
0.6	35.0	0.60	0.50	14.71	0.856	10.73	12.87	20%	11.34	6%	7.34	-31.6%
0.6	35.0	0.60	0.60	14.71	0.856	10.03	11.86	18%	11.25	12%	6.77	-32.5%
0.6	35.0	0.60	0.70	14.71	0.856	8.95	10.84	21%	11.24	26%	6.40	-28.5%
0.6	35.0	0.60	0.80	14.71	0.856	6.95	9.83	41%	11.27	62%	6.24	-10.2%
0.6	35.0	0.80	0.10	20.86	0.863	23.28	24.01	3%	22.71	-3%	20.83	-10.5%
0.6	35.0	0.80	0.20	20.86	0.863	18.91	22.57	19%	19.02	1%	15.95	-15.6%
0.6	35.0	0.80	0.30	20.86	0.863	16.71	21.13	26%	17.31	4%	13.26	-20.6%
0.6	35.0	0.80	0.40	20.86	0.863	15.44	19.69	28%	16.45	7%	11.52	-25.4%
0.6	35.0	0.80	0.50	20.86	0.863	14.40	18.25	27%	16.04	11%	10.30	-28.5%
0.6	35.0	0.80	0.60	20.86	0.863	13.32	16.81	26%	15.86	19%	9.43	-29.2%
0.6	35.0	0.80	0.70	20.86	0.863	11.75	15.37	31%	15.78	34%	8.85	-24.7%
0.6	35.0	0.80	0.80	20.86	0.863	8.97	13.93	55%	15.74	76%	8.55	-4.7%
0.6	35.0	1.00	0.10	27.11	0.869	29.88	31.20	4%	29.66	-1%	27.20	-9.0%
0.6	35.0	1.00	0.20	27.11	0.869	23.98	29.33	22%	24.78	3%	20.77	-13.4%
0.6	35.0	1.00	0.30	27.11	0.869	21.12	27.46	30%	22.50	7%	17.20	-18.5%
0.6	35.0	1.00	0.40	27.11	0.869	19.40	25.59	32%	21.34	10%	14.88	-23.3%
0.6	35.0	1.00	0.50	27.11	0.869	17.92	23.72	32%	20.76	16%	13.25	-26.1%
0.6	35.0	1.00	0.60	27.11	0.869	16.44	21.85	33%	20.47	25%	12.06	-26.6%
0.6	35.0	1.00	0.70	27.11	0.869	14.39	19.98	39%	20.31	41%	11.24	-21.9%
0.6	35.0	1.00	0.80	27.11	0.869	11.11	18.11	63%	20.19	82%	10.78	-3.0%
0.8	10.0	0.30	0.10	2.07	0.727	1.88	2.38	27%	2.14	14%	1.99	6.1%
0.8	10.0	0.30	0.20	2.07	0.727	1.74	2.24	29%	1.89	8%	1.64	-5.6%
0.8	10.0	0.65	0.10	4.71	0.747	4.45	5.42	22%	5.24	18%	4.87	9.4%
0.8	10.0	0.65	0.20	4.71	0.747	3.89	5.10	31%	4.49	16%	3.90	0.2%
0.8	10.0	1.00	0.10	7.41	0.761	7.00	8.53	22%	8.41	20%	7.82	11.7%
0.8	10.0	1.00	0.20	7.41	0.761	5.99	8.02	34%	7.16	20%	6.20	3.4%
0.8	15.0	0.30	0.10	2.51	0.770	2.59	2.89	12%	2.57	-1%	2.39	-7.9%
0.8	15.0	0.30	0.20	2.51	0.770	2.26	2.72	20%	2.25	-1%	1.93	-14.4%
0.8	15.0	0.30	0.30	2.51	0.770	2.15	2.54	18%	2.12	-2%	1.70	-21.1%
0.8	15.0	0.65	0.10	6.33	0.800	6.93	7.29	5%	6.95	0%	6.42	-7.4%
0.8	15.0	0.65	0.20	6.33	0.800	5.83	6.85	17%	5.90	1%	5.04	-13.5%
0.8	15.0	0.65	0.30	6.33	0.800	5.40	6.41	19%	5.45	1%	4.31	-20.1%
0.8	15.0	1.00	0.10	10.16	0.811	11.39	11.69	3%	11.34	-1%	10.47	-8.0%
0.8	15.0	1.00	0.20	10.16	0.811	9.43	10.99	17%	9.57	2%	8.17	-13.4%
0.8	15.0	1.00	0.30	10.16	0.811	8.60	10.29	20%	8.79	2%	6.94	-19.3%
0.8	20.0	0.30	0.10	3.06	0.792	3.03	3.52	16%	3.12	3%	2.89	-4.7%
0.8	20.0	0.30	0.20	3.06	0.792	2.57	3.31	29%	2.72	6%	2.32	-9.6%
0.8	20.0	0.30	0.30	3.06	0.792	2.38	3.10	30%	2.54	7%	2.02	-15.2%
0.8	20.0	0.30	0.40	3.06	0.792	2.39	2.89	21%	2.48	4%	1.84	-23.1%
0.8	20.0	0.65	0.10	8.04	0.825	9.29	9.25	0%	8.77	-6%	8.08	-13.1%

β	γ	τ	a/T	SCF	DoB	FEM Y_{1a}	Ho's Y_{1a}	Ho's Diff	BSI's Y_{1a}	BSI's Diff	Mod. Y_{1a}	Mod. Diff
0.8	20.0	0.65	0.20	8.04	0.825	7.62	8.70	14%	7.41	-3%	6.29	-17.5%
0.8	20.0	0.65	0.30	8.04	0.825	6.91	8.14	18%	6.81	-1%	5.32	-23.0%
0.8	20.0	0.65	0.40	8.04	0.825	6.62	7.59	15%	6.54	-1%	4.72	-28.7%
0.8	20.0	1.00	0.10	13.55	0.834	15.74	15.60	-1%	15.00	-5%	13.82	-12.2%
0.8	20.0	1.00	0.20	13.55	0.834	12.70	14.66	15%	12.61	-1%	10.69	-15.8%
0.8	20.0	1.00	0.30	13.55	0.834	11.37	13.73	21%	11.54	2%	9.00	-20.9%
0.8	20.0	1.00	0.40	13.55	0.834	10.50	12.79	22%	11.04	5%	7.94	-24.4%

Table E2

Comparison with Simplified Methods for a/c=0.2

β	γ	τ	a/T	SCF	DoB	FEM Y_{1a}	Ho's Y_{1a}	Ho's Diff	BSI's Y_{1a}	BSI's Diff	Has's Y_{1a}	Has's Diff
0.6	10.0	0.20	0.10	1.61	0.765	1.23	1.59	29%	1.52	24%	---	---
0.6	10.0	0.20	0.20	1.61	0.765	1.11	1.45	31%	1.31	18%	1.10	-1%
0.6	10.0	0.20	0.30	1.61	0.765	1.05	1.32	25%	1.20	14%	---	---
0.6	10.0	0.20	0.40	1.61	0.765	0.98	1.18	21%	1.12	15%	1.01	3%
0.6	10.0	0.20	0.50	1.61	0.765	0.95	1.05	10%	1.07	12%	---	---
0.6	10.0	0.30	0.13	2.52	0.773	1.95	2.42	24%	2.32	19%	---	---
0.6	10.0	0.40	0.10	3.46	0.780	2.95	3.41	16%	3.46	17%	---	---
0.6	10.0	0.40	0.20	3.46	0.780	2.52	3.12	24%	2.92	16%	2.37	-6%
0.6	10.0	0.40	0.30	3.46	0.780	2.33	2.83	21%	2.63	13%	---	---
0.6	10.0	0.40	0.40	3.46	0.780	2.18	2.54	16%	2.44	12%	2.15	-1%
0.6	10.0	0.40	0.50	3.46	0.780	2.09	2.25	8%	2.29	10%	---	---
0.6	10.0	0.60	0.10	5.38	0.790	4.76	5.30	11%	5.59	17%	---	---
0.6	10.0	0.60	0.20	5.38	0.790	3.91	4.85	24%	4.66	19%	3.68	-6%
0.6	10.0	0.60	0.30	5.38	0.790	3.53	4.40	25%	4.16	18%	---	---
0.6	10.0	0.60	0.40	5.38	0.790	3.25	3.95	22%	3.83	18%	3.32	2%
0.6	10.0	0.60	0.50	5.38	0.790	3.09	3.50	13%	3.57	16%	---	---
0.6	10.0	0.65	0.13	5.86	0.792	4.79	5.63	18%	5.73	20%	---	---
0.6	10.0	0.80	0.10	7.30	0.797	6.51	7.20	11%	7.71	18%	---	---
0.6	10.0	0.80	0.20	7.30	0.797	5.24	6.58	26%	6.39	22%	4.99	-5%
0.6	10.0	0.80	0.30	7.30	0.797	4.67	5.97	28%	5.68	22%	---	---
0.6	10.0	0.80	0.40	7.30	0.797	4.27	5.36	25%	5.21	22%	4.47	5%
0.6	10.0	0.80	0.50	7.30	0.797	4.00	4.75	19%	4.84	21%	---	---
0.6	10.0	1.00	0.10	9.17	0.802	8.18	9.04	11%	9.77	19%	---	---
0.6	10.0	1.00	0.13	9.17	0.802	7.45	8.81	18%	9.11	22%	---	---
0.6	10.0	1.00	0.20	9.17	0.802	6.51	8.27	27%	8.07	24%	6.26	-4%
0.6	10.0	1.00	0.30	9.17	0.802	5.75	7.50	30%	7.16	25%	---	---
0.6	10.0	1.00	0.40	9.17	0.802	5.22	6.73	29%	6.55	25%	5.60	7%
0.6	10.0	1.00	0.50	9.17	0.802	4.85	5.96	23%	6.07	25%	---	---
0.6	15.0	0.20	0.10	2.08	0.819	1.74	2.05	18%	1.95	12%	---	---
0.6	15.0	0.20	0.20	2.08	0.819	1.57	1.88	20%	1.66	6%	1.74	11%
0.6	15.0	0.20	0.30	2.08	0.819	1.45	1.70	17%	1.50	3%	---	---
0.6	15.0	0.20	0.40	2.08	0.819	1.32	1.53	16%	1.38	5%	1.53	16%
0.6	15.0	0.20	0.50	2.08	0.819	1.25	1.35	8%	1.29	3%	---	---
0.6	15.0	0.20	0.60	2.08	0.819	1.20	1.18	-2%	1.20	0%	1.41	18%
0.6	15.0	0.20	0.70	2.08	0.819	1.09	1.00	-8%	1.10	1%	---	---
0.6	15.0	0.20	0.80	2.08	0.819	0.87	0.83	-5%	0.99	14%	1.07	23%
0.6	15.0	0.30	0.10	3.32	0.804	3.07	3.27	7%	3.22	5%	---	---

β	γ	τ	a/T	SCF	DoB	FEM Y_{1a}	Ho's Y_{1a}	Ho's Diff	BSI's Y_{1a}	BSI's Diff	Has's Y_{1a}	Has's Diff
0.6	15.0	0.30	0.20	3.32	0.804	2.64	2.99	13%	2.73	3%	2.78	5%
0.6	15.0	0.30	0.30	3.32	0.804	2.41	2.72	13%	2.45	2%	---	---
0.6	15.0	0.30	0.40	3.32	0.804	2.18	2.44	12%	2.27	4%	2.48	14%
0.6	15.0	0.30	0.50	3.32	0.804	2.03	2.16	6%	2.12	4%	---	---
0.6	15.0	0.30	0.60	3.32	0.804	1.90	1.88	-1%	1.98	4%	2.32	22%
0.6	15.0	0.30	0.70	3.32	0.804	1.67	1.60	-4%	1.83	9%	---	---
0.6	15.0	0.30	0.80	3.32	0.804	1.30	1.32	2%	1.66	27%	1.78	37%
0.6	15.0	0.50	0.10	6.06	0.817	5.91	5.98	1%	6.14	4%	---	---
0.6	15.0	0.50	0.20	6.06	0.817	4.83	5.47	13%	5.12	6%	5.07	5%
0.6	15.0	0.50	0.30	6.06	0.817	4.24	4.96	17%	4.55	7%	---	---
0.6	15.0	0.50	0.40	6.06	0.817	3.84	4.45	16%	4.17	9%	4.48	17%
0.6	15.0	0.50	0.50	6.06	0.817	3.59	3.94	10%	3.86	8%	---	---
0.6	15.0	0.50	0.60	6.06	0.817	3.31	3.43	4%	3.57	8%	4.14	25%
0.6	15.0	0.50	0.70	6.06	0.817	2.87	2.92	2%	3.27	14%	---	---
0.6	15.0	0.50	0.80	6.06	0.817	2.18	2.41	11%	2.93	35%	3.12	43%
0.6	15.0	0.65	0.10	8.27	0.836	8.03	8.15	2%	8.56	7%	---	---
0.6	15.0	0.65	0.20	8.27	0.836	6.43	7.46	16%	7.05	10%	6.90	7%
0.6	15.0	0.65	0.30	8.27	0.836	5.59	6.76	21%	6.22	11%	---	---
0.6	15.0	0.65	0.40	8.27	0.836	5.02	6.07	21%	5.65	13%	6.01	20%
0.6	15.0	0.65	0.50	8.27	0.836	4.65	5.38	16%	5.19	12%	---	---
0.6	15.0	0.65	0.60	8.27	0.836	4.18	4.68	12%	4.75	14%	5.46	31%
0.6	15.0	0.65	0.70	8.27	0.836	3.58	3.99	11%	4.30	20%	---	---
0.6	15.0	0.65	0.80	8.27	0.836	2.77	3.29	19%	3.81	37%	4.02	45%
0.6	15.0	0.80	0.10	10.51	0.841	10.10	10.36	3%	10.96	9%	---	---
0.6	15.0	0.80	0.20	10.51	0.841	8.01	9.48	18%	9.00	12%	8.77	10%
0.6	15.0	0.80	0.30	10.51	0.841	6.90	8.60	25%	7.93	15%	---	---
0.6	15.0	0.80	0.40	10.51	0.841	6.16	7.71	25%	7.18	17%	7.61	24%
0.6	15.0	0.80	0.50	10.51	0.841	5.65	6.83	21%	6.58	16%	---	---
0.6	15.0	0.80	0.60	10.51	0.841	5.04	5.95	18%	6.01	19%	6.87	36%
0.6	15.0	0.80	0.70	10.51	0.841	4.28	5.07	18%	5.42	27%	---	---
0.6	15.0	0.80	0.80	10.51	0.841	3.21	4.18	30%	4.77	49%	5.03	57%
0.6	15.0	1.00	0.10	13.45	0.846	12.79	13.26	4%	14.12	10%	---	---
0.6	15.0	1.00	0.20	13.45	0.846	10.06	12.13	21%	11.57	15%	11.22	12%
0.6	15.0	1.00	0.30	13.45	0.846	8.60	11.00	28%	10.16	18%	---	---
0.6	15.0	1.00	0.40	13.45	0.846	7.61	9.87	30%	9.19	21%	9.70	27%
0.6	15.0	1.00	0.50	13.45	0.846	6.93	8.74	26%	8.40	21%	---	---
0.6	15.0	1.00	0.60	13.45	0.846	6.12	7.61	24%	7.65	25%	8.72	42%
0.6	15.0	1.00	0.70	13.45	0.846	5.14	6.48	26%	6.88	34%	---	---
0.6	15.0	1.00	0.80	13.45	0.846	3.80	5.35	41%	6.03	59%	6.33	67%
0.6	20.0	0.20	0.10	2.51	0.812	2.15	2.47	15%	2.35	9%	---	---
0.6	20.0	0.20	0.20	2.51	0.812	1.92	2.26	18%	2.01	5%	2.42	26%
0.6	20.0	0.20	0.30	2.51	0.812	1.76	2.05	17%	1.81	3%	---	---

β	γ	τ	a/T	SCF	DoB	FEM Y_{Ia}	Ho's Y_{Ia}	Ho's Diff	BSI's Y_{Ia}	BSI's Diff	Has's Y_{Ia}	Has's Diff
0.6	20.0	0.20	0.40	2.51	0.812	1.59	1.84	16%	1.68	6%	2.15	35%
0.6	20.0	0.20	0.50	2.51	0.812	1.46	1.63	12%	1.57	8%	---	---
0.6	20.0	0.20	0.60	2.51	0.812	1.39	1.42	2%	1.46	5%	2.00	44%
0.6	20.0	0.20	0.70	2.51	0.812	1.22	1.21	-1%	1.35	11%	---	---
0.6	20.0	0.20	0.80	2.51	0.812	0.93	1.00	7%	1.22	31%	1.52	63%
0.6	20.0	0.30	0.27	4.16	0.824	3.10	3.51	13%	3.13	1%	---	---
0.6	20.0	0.40	0.10	5.89	0.831	5.78	5.81	0%	5.82	1%	---	---
0.6	20.0	0.40	0.20	5.89	0.831	4.78	5.31	11%	4.87	2%	5.68	19%
0.6	20.0	0.40	0.30	5.89	0.831	4.17	4.82	16%	4.34	4%	---	---
0.6	20.0	0.40	0.40	5.89	0.831	3.72	4.32	16%	3.97	7%	4.97	34%
0.6	20.0	0.40	0.50	5.89	0.831	3.38	3.83	13%	3.66	8%	---	---
0.6	20.0	0.40	0.60	5.89	0.831	3.15	3.33	6%	3.38	7%	4.53	44%
0.6	20.0	0.40	0.70	5.89	0.831	2.59	2.84	10%	3.07	19%	---	---
0.6	20.0	0.40	0.80	5.89	0.831	1.89	2.34	24%	2.73	45%	3.36	78%
0.6	20.0	0.60	0.10	9.74	0.847	9.48	9.60	1%	9.97	5%	---	---
0.6	20.0	0.60	0.20	9.74	0.847	7.56	8.79	16%	8.22	9%	9.38	24%
0.6	20.0	0.60	0.30	9.74	0.847	6.49	7.97	23%	7.24	12%	---	---
0.6	20.0	0.60	0.40	9.74	0.847	5.74	7.15	25%	6.57	14%	8.11	41%
0.6	20.0	0.60	0.50	9.74	0.847	5.14	6.33	23%	6.01	17%	---	---
0.6	20.0	0.60	0.60	9.74	0.847	4.61	5.51	20%	5.48	19%	7.28	58%
0.6	20.0	0.60	0.70	9.74	0.847	3.84	4.69	22%	4.93	29%	---	---
0.6	20.0	0.60	0.80	9.74	0.847	2.82	3.88	37%	4.33	54%	5.28	87%
0.6	20.0	0.65	0.27	10.73	0.848	7.39	9.05	22%	8.29	12%	---	---
0.6	20.0	0.80	0.10	13.71	0.853	13.09	13.52	3%	14.25	9%	---	---
0.6	20.0	0.80	0.20	13.71	0.853	10.29	12.37	20%	11.68	14%	13.20	28%
0.6	20.0	0.80	0.30	13.71	0.853	8.78	11.21	28%	10.25	17%	---	---
0.6	20.0	0.80	0.40	13.71	0.853	7.68	10.06	31%	9.26	21%	11.35	48%
0.6	20.0	0.80	0.50	13.71	0.853	6.80	8.91	31%	8.45	24%	---	---
0.6	20.0	0.80	0.60	13.71	0.853	6.01	7.76	29%	7.68	28%	10.13	69%
0.6	20.0	0.80	0.70	13.71	0.853	4.93	6.61	34%	6.88	40%	---	---
0.6	20.0	0.80	0.80	13.71	0.853	3.50	5.46	56%	6.01	72%	7.28	108%
0.6	20.0	1.00	0.10	17.68	0.858	16.64	17.43	5%	18.48	11%	---	---
0.6	20.0	1.00	0.20	17.68	0.858	12.96	15.95	23%	15.11	17%	17.02	31%
0.6	20.0	1.00	0.30	17.68	0.858	10.91	14.46	33%	13.23	21%	---	---
0.6	20.0	1.00	0.40	17.68	0.858	9.53	12.98	36%	11.93	25%	14.58	53%
0.6	20.0	1.00	0.50	17.68	0.858	8.35	11.49	38%	10.86	30%	---	---
0.6	20.0	1.00	0.60	17.68	0.858	7.31	10.01	37%	9.84	35%	12.94	77%
0.6	20.0	1.00	0.70	17.68	0.858	5.94	8.52	43%	8.79	48%	---	---
0.6	20.0	1.00	0.80	17.68	0.858	4.16	7.04	69%	7.64	84%	9.23	122%
0.6	25.0	0.20	0.10	2.91	0.821	2.50	2.87	15%	2.72	9%	---	---
0.6	25.0	0.20	0.20	2.91	0.821	2.19	2.62	20%	2.32	6%	3.14	43%
0.6	25.0	0.20	0.30	2.91	0.821	1.99	2.38	20%	2.09	5%	---	---

β	γ	τ	a/T	SCF	DoB	FEM Y_{1a}	Ho's Y_{1a}	Ho's Diff	BSI's Y_{1a}	BSI's Diff	Has's Y_{1a}	Has's Diff
0.6	25.0	0.20	0.40	2.91	0.821	1.75	2.14	22%	1.93	10%	2.77	58%
0.6	25.0	0.20	0.50	2.91	0.821	1.62	1.89	17%	1.80	11%	---	---
0.6	25.0	0.20	0.60	2.91	0.821	1.46	1.65	13%	1.67	15%	2.55	74%
0.6	25.0	0.20	0.70	2.91	0.821	1.26	1.40	11%	1.54	22%	---	---
0.6	25.0	0.20	0.80	2.91	0.821	0.96	1.16	21%	1.38	44%	1.91	99%
0.6	25.0	0.40	0.10	7.00	0.847	6.84	6.90	1%	6.89	1%	---	---
0.6	25.0	0.40	0.20	7.00	0.847	5.59	6.31	13%	5.75	3%	7.54	35%
0.6	25.0	0.40	0.30	7.00	0.847	4.83	5.73	19%	5.10	6%	---	---
0.6	25.0	0.40	0.40	7.00	0.847	4.24	5.14	21%	4.64	10%	6.51	54%
0.6	25.0	0.40	0.50	7.00	0.847	3.80	4.55	20%	4.27	12%	---	---
0.6	25.0	0.40	0.60	7.00	0.847	3.35	3.96	18%	3.90	17%	5.85	75%
0.6	25.0	0.40	0.70	7.00	0.847	2.79	3.37	21%	3.52	26%	---	---
0.6	25.0	0.40	0.80	7.00	0.847	2.00	2.79	39%	3.10	55%	4.24	112%
0.6	25.0	0.60	0.10	11.67	0.853	11.26	11.51	2%	11.93	6%	---	---
0.6	25.0	0.60	0.20	11.67	0.853	8.91	10.53	18%	9.82	10%	12.56	41%
0.6	25.0	0.60	0.30	11.67	0.853	7.54	9.55	27%	8.64	15%	---	---
0.6	25.0	0.60	0.40	11.67	0.853	6.58	8.57	30%	7.82	19%	10.80	64%
0.6	25.0	0.60	0.50	11.67	0.853	5.82	7.59	30%	7.14	23%	---	---
0.6	25.0	0.60	0.60	11.67	0.853	5.03	6.61	31%	6.50	29%	9.64	92%
0.6	25.0	0.60	0.70	11.67	0.853	4.12	5.62	37%	5.83	42%	---	---
0.6	25.0	0.60	0.80	11.67	0.853	3.04	4.64	53%	5.10	68%	6.93	128%
0.6	25.0	0.80	0.10	16.48	0.859	15.57	16.25	4%	17.09	10%	---	---
0.6	25.0	0.80	0.20	16.48	0.859	12.15	14.86	22%	13.99	15%	17.74	46%
0.6	25.0	0.80	0.30	16.48	0.859	10.22	13.48	32%	12.27	20%	---	---
0.6	25.0	0.80	0.40	16.48	0.859	8.84	12.10	37%	11.06	25%	15.18	72%
0.6	25.0	0.80	0.50	16.48	0.859	7.73	10.71	39%	10.07	30%	---	---
0.6	25.0	0.80	0.60	16.48	0.859	6.60	9.33	41%	9.13	38%	13.46	104%
0.6	25.0	0.80	0.70	16.48	0.859	5.35	7.94	48%	8.15	52%	---	---
0.6	25.0	0.80	0.80	16.48	0.859	3.71	6.56	77%	7.09	91%	9.58	158%
0.6	25.0	1.00	0.10	21.33	0.864	19.84	21.03	6%	22.25	12%	---	---
0.6	25.0	1.00	0.20	21.33	0.864	15.35	19.24	25%	18.17	18%	22.95	49%
0.6	25.0	1.00	0.30	21.33	0.864	12.85	17.45	36%	15.89	24%	---	---
0.6	25.0	1.00	0.40	21.33	0.864	11.00	15.66	42%	14.31	30%	19.57	78%
0.6	25.0	1.00	0.50	21.33	0.864	9.52	13.86	46%	12.99	37%	---	---
0.6	25.0	1.00	0.60	21.33	0.864	8.06	12.07	50%	11.75	46%	17.26	114%
0.6	25.0	1.00	0.70	21.33	0.864	6.46	10.28	59%	10.45	62%	---	---
0.6	25.0	1.00	0.80	21.33	0.864	4.42	8.49	92%	9.05	105%	12.19	176%
0.6	30.0	0.20	0.10	3.23	0.825	2.77	3.18	15%	3.02	9%	---	---
0.6	30.0	0.20	0.20	3.23	0.825	2.37	2.91	23%	2.57	9%	3.82	61%
0.6	30.0	0.20	0.30	3.23	0.825	2.12	2.64	25%	2.31	9%	---	---
0.6	30.0	0.20	0.40	3.23	0.825	1.88	2.37	26%	2.14	14%	3.35	78%
0.6	30.0	0.20	0.50	3.23	0.825	1.69	2.10	24%	1.99	18%	---	---

β	γ	τ	a/T	SCF	DoB	FEM Y_{1a}	Ho's Y_{1a}	Ho's Diff	BSI's Y_{1a}	BSI's Diff	Has's Y_{1a}	Has's Diff
0.6	30.0	0.20	0.60	3.23	0.825	1.53	1.83	19%	1.84	21%	3.07	101%
0.6	30.0	0.20	0.70	3.23	0.825	1.31	1.56	19%	1.69	29%	---	---
0.6	30.0	0.20	0.80	3.23	0.825	0.99	1.29	30%	1.52	53%	2.30	132%
0.6	30.0	0.40	0.10	7.96	0.849	7.65	7.85	3%	7.84	2%	---	---
0.6	30.0	0.40	0.20	7.96	0.849	6.12	7.18	17%	6.53	7%	9.39	53%
0.6	30.0	0.40	0.30	7.96	0.849	5.25	6.51	24%	5.79	10%	---	---
0.6	30.0	0.40	0.40	7.96	0.849	4.56	5.84	28%	5.27	16%	8.10	78%
0.6	30.0	0.40	0.50	7.96	0.849	4.04	5.17	28%	4.84	20%	---	---
0.6	30.0	0.40	0.60	7.96	0.849	3.53	4.51	28%	4.42	25%	7.26	106%
0.6	30.0	0.40	0.70	7.96	0.849	2.94	3.84	31%	3.99	36%	---	---
0.6	30.0	0.40	0.80	7.96	0.849	2.17	3.17	46%	3.50	62%	5.25	142%
0.6	30.0	0.60	0.10	13.31	0.855	12.77	13.12	3%	13.60	7%	---	---
0.6	30.0	0.60	0.20	13.31	0.855	9.87	12.01	22%	11.19	13%	15.70	59%
0.6	30.0	0.60	0.30	13.31	0.855	8.27	10.89	32%	9.84	19%	---	---
0.6	30.0	0.60	0.40	13.31	0.855	7.13	9.77	37%	8.90	25%	13.48	89%
0.6	30.0	0.60	0.50	13.31	0.855	6.27	8.65	38%	8.13	30%	---	---
0.6	30.0	0.60	0.60	13.31	0.855	5.39	7.53	40%	7.39	37%	12.00	123%
0.6	30.0	0.60	0.70	13.31	0.855	4.40	6.42	46%	6.62	50%	---	---
0.6	30.0	0.60	0.80	13.31	0.855	3.17	5.30	67%	5.78	82%	8.60	171%
0.6	30.0	0.80	0.10	18.84	0.862	17.69	18.58	5%	19.53	10%	---	---
0.6	30.0	0.80	0.20	18.84	0.862	13.53	16.99	26%	15.97	18%	22.21	64%
0.6	30.0	0.80	0.30	18.84	0.862	11.27	15.41	37%	13.99	24%	---	---
0.6	30.0	0.80	0.40	18.84	0.862	9.64	13.83	43%	12.61	31%	18.96	97%
0.6	30.0	0.80	0.50	18.84	0.862	8.38	12.25	46%	11.47	37%	---	---
0.6	30.0	0.80	0.60	18.84	0.862	7.12	10.66	50%	10.38	46%	16.76	135%
0.6	30.0	0.80	0.70	18.84	0.862	5.74	9.08	58%	9.25	61%	---	---
0.6	30.0	0.80	0.80	18.84	0.862	4.07	7.50	84%	8.03	97%	11.88	192%
0.6	30.0	1.00	0.10	24.45	0.867	22.66	24.11	6%	25.48	12%	---	---
0.6	30.0	1.00	0.20	24.45	0.867	17.15	22.05	29%	20.79	21%	28.81	68%
0.6	30.0	1.00	0.30	24.45	0.867	14.22	20.00	41%	18.18	28%	---	---
0.6	30.0	1.00	0.40	24.45	0.867	12.05	17.95	49%	16.35	36%	24.51	103%
0.6	30.0	1.00	0.50	24.45	0.867	10.35	15.89	54%	14.83	43%	---	---
0.6	30.0	1.00	0.60	24.45	0.867	8.70	13.84	59%	13.39	54%	21.55	148%
0.6	30.0	1.00	0.70	24.45	0.867	6.95	11.78	70%	11.89	71%	---	---
0.6	30.0	1.00	0.80	24.45	0.867	4.87	9.73	100%	10.27	111%	15.15	211%
0.6	35.0	0.20	0.10	3.50	0.826	2.98	3.45	16%	3.27	10%	---	---
0.6	35.0	0.20	0.20	3.50	0.826	2.79	3.16	13%	2.78	0%	4.47	60%
0.6	35.0	0.20	0.30	3.50	0.826	2.47	2.86	16%	2.51	2%	---	---
0.6	35.0	0.20	0.40	3.50	0.826	2.27	2.57	13%	2.31	2%	3.92	73%
0.6	35.0	0.20	0.50	3.50	0.826	2.08	2.28	9%	2.15	3%	---	---
0.6	35.0	0.20	0.60	3.50	0.826	1.87	1.98	6%	2.00	7%	3.59	92%
0.6	35.0	0.20	0.70	3.50	0.826	1.60	1.69	5%	1.83	14%	---	---

β	γ	τ	a/T	SCF	DoB	FEM Y_{1a}	Ho's Y_{1a}	Ho's Diff	BSI's Y_{1a}	BSI's Diff	Has's Y_{1a}	Has's Diff
0.6	35.0	0.20	0.80	3.50	0.826	1.17	1.39	19%	1.64	40%	2.68	129%
0.6	35.0	0.40	0.10	8.75	0.850	8.59	8.63	0%	8.61	0%	---	---
0.6	35.0	0.40	0.20	8.75	0.850	7.37	7.89	7%	7.17	-3%	11.15	51%
0.6	35.0	0.40	0.30	8.75	0.850	6.36	7.16	13%	6.36	0%	---	---
0.6	35.0	0.40	0.40	8.75	0.850	5.67	6.42	13%	5.79	2%	9.61	69%
0.6	35.0	0.40	0.50	8.75	0.850	5.05	5.69	13%	5.31	5%	---	---
0.6	35.0	0.40	0.60	8.75	0.850	4.42	4.95	12%	4.85	10%	8.60	95%
0.6	35.0	0.40	0.70	8.75	0.850	3.63	4.22	16%	4.37	20%	---	---
0.6	35.0	0.40	0.80	8.75	0.850	2.51	3.48	39%	3.84	53%	6.21	147%
0.6	35.0	0.60	0.10	14.71	0.856	14.32	14.50	1%	15.03	5%	---	---
0.6	35.0	0.60	0.20	14.71	0.856	11.96	13.27	11%	12.36	3%	18.73	57%
0.6	35.0	0.60	0.30	14.71	0.856	10.16	12.03	18%	10.87	7%	---	---
0.6	35.0	0.60	0.40	14.71	0.856	8.97	10.80	20%	9.83	10%	16.07	79%
0.6	35.0	0.60	0.50	14.71	0.856	7.88	9.56	21%	8.97	14%	---	---
0.6	35.0	0.60	0.60	14.71	0.856	6.78	8.33	23%	8.15	20%	14.30	111%
0.6	35.0	0.60	0.70	14.71	0.856	5.47	7.09	30%	7.30	33%	---	---
0.6	35.0	0.60	0.80	14.71	0.856	3.81	5.85	54%	6.37	67%	10.23	168%
0.6	35.0	0.80	0.10	20.86	0.863	20.33	20.57	1%	21.61	6%	---	---
0.6	35.0	0.80	0.20	20.86	0.863	16.46	18.82	14%	17.68	7%	26.56	61%
0.6	35.0	0.80	0.30	20.86	0.863	13.94	17.06	22%	15.48	11%	---	---
0.6	35.0	0.80	0.40	20.86	0.863	12.22	15.31	25%	13.95	14%	22.66	85%
0.6	35.0	0.80	0.50	20.86	0.863	10.66	13.56	27%	12.68	19%	---	---
0.6	35.0	0.80	0.60	20.86	0.863	8.97	11.81	32%	11.47	28%	20.01	123%
0.6	35.0	0.80	0.70	20.86	0.863	7.12	10.05	41%	10.22	44%	---	---
0.6	35.0	0.80	0.80	20.86	0.863	4.78	8.30	74%	8.86	85%	14.15	196%
0.6	35.0	1.00	0.10	27.11	0.869	26.18	26.73	2%	28.23	8%	---	---
0.6	35.0	1.00	0.20	27.11	0.869	21.16	24.45	16%	23.03	9%	34.50	63%
0.6	35.0	1.00	0.30	27.11	0.869	17.77	22.18	25%	20.12	13%	---	---
0.6	35.0	1.00	0.40	27.11	0.869	15.44	19.90	29%	18.09	17%	29.30	90%
0.6	35.0	1.00	0.50	27.11	0.869	13.28	17.62	33%	16.40	24%	---	---
0.6	35.0	1.00	0.60	27.11	0.869	11.10	15.34	38%	14.79	33%	25.71	132%
0.6	35.0	1.00	0.70	27.11	0.869	8.68	13.07	51%	13.12	51%	---	---
0.6	35.0	1.00	0.80	27.11	0.869	5.71	10.79	89%	11.31	98%	18.01	215%
0.8	10.0	0.30	0.10	2.07	0.727	1.72	2.04	19%	2.04	19%	---	---
0.8	10.0	0.30	0.13	2.07	0.727	1.64	1.99	21%	1.93	18%	---	---
0.8	10.0	0.30	0.20	2.07	0.727	1.53	1.87	22%	1.76	15%	1.42	-7%
0.8	10.0	0.30	0.30	2.07	0.727	1.45	1.69	17%	1.61	11%	---	---
0.8	10.0	0.30	0.40	2.07	0.727	1.34	1.52	13%	1.51	13%	1.34	0%
0.8	10.0	0.65	0.10	4.71	0.747	4.11	4.64	13%	4.99	21%	---	---
0.8	10.0	0.65	0.13	4.71	0.747	3.83	4.53	18%	4.67	22%	---	---
0.8	10.0	0.65	0.20	4.71	0.747	3.47	4.25	22%	4.18	21%	3.23	-7%
0.8	10.0	0.65	0.30	4.71	0.747	3.17	3.85	22%	3.76	19%	---	---

β	γ	τ	a/T	SCF	DoB	FEM Y_{1a}	Ho's Y_{1a}	Ho's Diff	BSI's Y_{1a}	BSI's Diff	Has's Y_{1a}	Has's Diff
0.8	10.0	0.65	0.40	4.71	0.747	2.91	3.46	19%	3.50	20%	3.00	3%
0.8	10.0	1.00	0.10	7.41	0.761	6.50	7.31	12%	8.00	23%	---	---
0.8	10.0	1.00	0.13	7.41	0.761	6.02	7.12	18%	7.48	24%	---	---
0.8	10.0	1.00	0.20	7.41	0.761	5.38	6.68	24%	6.66	24%	5.08	-6%
0.8	10.0	1.00	0.30	7.41	0.761	4.83	6.06	25%	5.96	23%	---	---
0.8	10.0	1.00	0.40	7.41	0.761	4.37	5.44	24%	5.50	26%	4.67	7%
0.8	15.0	0.30	0.10	2.51	0.770	2.37	2.47	4%	2.45	3%	---	---
0.8	15.0	0.30	0.20	2.51	0.770	2.05	2.26	10%	2.09	2%	2.10	3%
0.8	15.0	0.30	0.30	2.51	0.770	1.85	2.05	11%	1.90	3%	---	---
0.8	15.0	0.30	0.40	2.51	0.770	1.70	1.84	8%	1.77	4%	1.92	13%
0.8	15.0	0.30	0.50	2.51	0.770	1.60	1.63	2%	1.67	4%	---	---
0.8	15.0	0.30	0.60	2.51	0.770	1.49	1.42	-5%	1.58	6%	1.85	24%
0.8	15.0	0.65	0.10	6.33	0.800	6.42	6.24	-3%	6.61	3%	---	---
0.8	15.0	0.65	0.20	6.33	0.800	5.30	5.71	8%	5.49	4%	5.30	0%
0.8	15.0	0.65	0.30	6.33	0.800	4.64	5.18	12%	4.88	5%	---	---
0.8	15.0	0.65	0.40	6.33	0.800	4.19	4.65	11%	4.48	7%	4.74	13%
0.8	15.0	0.65	0.50	6.33	0.800	3.82	4.11	8%	4.16	9%	---	---
0.8	15.0	0.65	0.60	6.33	0.800	3.43	3.58	4%	3.86	13%	4.45	30%
0.8	15.0	1.00	0.10	10.16	0.811	10.58	10.02	-5%	10.79	2%	---	---
0.8	15.0	1.00	0.20	10.16	0.811	8.61	9.16	6%	8.90	3%	8.50	-1%
0.8	15.0	1.00	0.30	10.16	0.811	7.42	8.31	12%	7.88	6%	---	---
0.8	15.0	1.00	0.40	10.16	0.811	6.60	7.46	13%	7.19	9%	7.54	14%
0.8	15.0	1.00	0.50	10.16	0.811	5.91	6.60	12%	6.64	12%	---	---
0.8	15.0	1.00	0.60	10.16	0.811	5.23	5.75	10%	6.14	17%	7.01	34%
0.8	20.0	0.30	0.10	3.06	0.792	2.60	3.02	16%	2.97	14%	---	---
0.8	20.0	0.30	0.20	3.06	0.792	2.31	2.76	19%	2.53	9%	2.96	28%
0.8	20.0	0.30	0.27	3.06	0.792	2.12	2.58	22%	2.34	11%	---	---
0.8	20.0	0.30	0.30	3.06	0.792	2.04	2.50	23%	2.28	12%	---	---
0.8	20.0	0.30	0.40	3.06	0.792	1.84	2.25	22%	2.11	15%	2.66	45%
0.8	20.0	0.30	0.50	3.06	0.792	1.66	1.99	20%	1.98	19%	---	---
0.8	20.0	0.30	0.60	3.06	0.792	1.51	1.73	15%	1.86	23%	2.52	67%
0.8	20.0	0.30	0.70	3.06	0.792	1.30	1.47	13%	1.73	33%	---	---
0.8	20.0	0.30	0.80	3.06	0.792	1.04	1.22	17%	1.58	52%	1.96	88%
0.8	20.0	0.65	0.10	8.04	0.825	8.37	7.93	-5%	8.35	0%	---	---
0.8	20.0	0.65	0.20	8.04	0.825	6.94	7.25	4%	6.89	-1%	7.76	12%
0.8	20.0	0.65	0.27	8.04	0.825	6.22	6.78	9%	6.30	1%	---	---
0.8	20.0	0.65	0.30	8.04	0.825	5.91	6.58	11%	6.10	3%	---	---
0.8	20.0	0.65	0.40	8.04	0.825	5.22	5.90	13%	5.56	6%	6.81	31%
0.8	20.0	0.65	0.50	8.04	0.825	4.66	5.23	12%	5.12	10%	---	---
0.8	20.0	0.65	0.60	8.04	0.825	4.03	4.55	13%	4.71	17%	6.25	55%
0.8	20.0	0.65	0.70	8.04	0.825	3.31	3.88	17%	4.28	29%	---	---

β	γ	τ	a/T	SCF	DoB	FEM Y_{Ia}	Ho's Y_{Ia}	Ho's Diff	BSI's Y_{Ia}	BSI's Diff	Has's Y_{Ia}	Has's Diff
0.8	20.0	0.65	0.80	8.04	0.825	2.45	3.20	31%	3.82	56%	4.67	91%
0.8	20.0	1.00	0.10	13.55	0.834	14.44	13.36	-7%	14.28	-1%	---	---
0.8	20.0	1.00	0.20	13.55	0.834	11.64	12.22	5%	11.73	1%	13.06	12%
0.8	20.0	1.00	0.27	13.55	0.834	10.34	11.43	10%	10.68	3%	---	---
0.8	20.0	1.00	0.30	13.55	0.834	9.79	11.08	13%	10.33	6%	---	---
0.8	20.0	1.00	0.40	13.55	0.834	8.49	9.95	17%	9.37	10%	11.40	34%
0.8	20.0	1.00	0.50	13.55	0.834	7.40	8.81	19%	8.60	16%	---	---
0.8	20.0	1.00	0.60	13.55	0.834	6.32	7.67	21%	7.87	25%	10.36	64%
0.8	20.0	1.00	0.70	13.55	0.834	5.10	6.53	28%	7.12	40%	---	---
0.8	20.0	1.00	0.80	13.55	0.834	3.68	5.39	47%	6.30	71%	7.65	108%

Table E3

Comparison with Simplified Methods for a/c=0.3

β	γ	τ	a/T	SCF	DoB	FEM Y_{1a}	Ho's Y_{1a}	Ho's Diff	BSI's Y_{1a}	BSI's Diff	Mod Y_{1a}	Mod's Diff
0.6	10.0	0.20	0.10	1.61	0.765	1.10	1.41	28%	1.44	31%	1.33	21.3%
0.6	10.0	0.20	0.20	1.61	0.765	1.02	1.28	25%	1.22	20%	1.06	3.4%
0.6	10.0	0.20	0.30	1.61	0.765	0.92	1.14	24%	1.09	19%	0.88	-4.3%
0.6	10.0	0.20	0.40	1.61	0.765	0.82	1.01	23%	1.00	22%	0.76	-7.6%
0.6	10.0	0.20	0.50	1.61	0.765	0.76	0.88	15%	0.91	20%	0.67	-12.4%
0.6	10.0	0.20	0.60	1.61	0.765	0.71	0.74	5%	0.83	17%	0.60	-15.8%
0.6	10.0	0.20	0.70	1.61	0.765	0.63	0.61	-3%	0.75	18%	0.55	-12.7%
0.6	10.0	0.20	0.80	1.61	0.765	0.50	0.48	-5%	0.65	31%	0.52	4.2%
0.6	10.0	0.40	0.10	3.46	0.780	2.69	3.03	13%	3.27	22%	3.03	12.5%
0.6	10.0	0.40	0.20	3.46	0.780	2.29	2.75	20%	2.72	19%	2.34	2.2%
0.6	10.0	0.40	0.30	3.46	0.780	2.02	2.46	22%	2.40	19%	1.92	-4.8%
0.6	10.0	0.40	0.40	3.46	0.780	1.83	2.17	19%	2.16	18%	1.63	-11.0%
0.6	10.0	0.40	0.50	3.46	0.780	1.67	1.89	13%	1.96	17%	1.41	-15.5%
0.6	10.0	0.40	0.60	3.46	0.780	1.49	1.60	7%	1.77	19%	1.25	-16.1%
0.6	10.0	0.40	0.70	3.46	0.780	1.26	1.31	4%	1.57	24%	1.13	-10.0%
0.6	10.0	0.40	0.80	3.46	0.780	0.95	1.02	8%	1.35	42%	1.06	11.8%
0.6	10.0	0.60	0.10	5.38	0.790	4.35	4.72	8%	5.28	21%	4.89	12.3%
0.6	10.0	0.60	0.20	5.38	0.790	3.58	4.27	19%	4.34	21%	3.72	3.9%
0.6	10.0	0.60	0.30	5.38	0.790	3.08	3.83	24%	3.79	23%	3.02	-1.9%
0.6	10.0	0.60	0.40	5.38	0.790	2.73	3.38	24%	3.39	24%	2.54	-7.1%
0.6	10.0	0.60	0.50	5.38	0.790	2.47	2.93	19%	3.05	24%	2.18	-11.9%
0.6	10.0	0.60	0.60	5.38	0.790	2.22	2.49	12%	2.73	23%	1.91	-14.1%
0.6	10.0	0.60	0.70	5.38	0.790	1.89	2.04	8%	2.40	27%	1.71	-9.3%
0.6	10.0	0.60	0.80	5.38	0.790	1.41	1.59	13%	2.05	45%	1.59	12.8%
0.6	10.0	0.80	0.10	7.30	0.797	5.96	6.40	7%	7.29	22%	6.74	13.1%
0.6	10.0	0.80	0.20	7.30	0.797	4.81	5.80	21%	5.95	24%	5.10	6.0%
0.6	10.0	0.80	0.30	7.30	0.797	4.09	5.19	27%	5.18	27%	4.12	0.7%
0.6	10.0	0.80	0.40	7.30	0.797	3.59	4.58	28%	4.61	28%	3.44	-4.3%
0.6	10.0	0.80	0.50	7.30	0.797	3.21	3.98	24%	4.13	29%	2.93	-8.7%
0.6	10.0	0.80	0.60	7.30	0.797	2.81	3.37	20%	3.68	31%	2.55	-9.1%
0.6	10.0	0.80	0.70	7.30	0.797	2.31	2.77	20%	3.22	39%	2.28	-1.3%
0.6	10.0	0.80	0.80	7.30	0.797	1.71	2.16	26%	2.73	60%	2.10	22.9%
0.6	10.0	1.00	0.10	9.17	0.802	7.52	8.04	7%	9.23	23%	8.54	13.6%
0.6	10.0	1.00	0.20	9.17	0.802	5.98	7.28	22%	7.52	26%	6.44	7.7%
0.6	10.0	1.00	0.30	9.17	0.802	5.05	6.52	29%	6.52	29%	5.19	2.7%
0.6	10.0	1.00	0.40	9.17	0.802	4.39	5.76	31%	5.79	32%	4.31	-1.8%
0.6	10.0	1.00	0.50	9.17	0.802	3.89	5.00	28%	5.18	33%	3.66	-5.8%
0.6	10.0	1.00	0.60	9.17	0.802	3.36	4.24	26%	4.60	37%	3.18	-5.4%

β	γ	τ	a/T	SCF	DoB	FEM Y_{1a}	Ho's Y_{1a}	Ho's Diff	BSI's Y_{1a}	BSI's Diff	Mod Y_{1a}	Mod's Diff
0.6	10.0	1.00	0.70	9.17	0.802	2.73	3.48	27%	4.01	47%	2.82	3.4%
0.6	10.0	1.00	0.80	9.17	0.802	1.98	2.71	37%	3.38	71%	2.59	30.8%
0.6	15.0	0.20	0.10	2.08	0.819	1.50	1.82	22%	1.84	23%	1.69	12.9%
0.6	15.0	0.20	0.20	2.08	0.819	1.41	1.65	17%	1.55	10%	1.31	-6.9%
0.6	15.0	0.20	0.30	2.08	0.819	1.26	1.48	17%	1.36	8%	1.07	-15.2%
0.6	15.0	0.20	0.40	2.08	0.819	1.10	1.31	19%	1.22	11%	0.89	-18.9%
0.6	15.0	0.20	0.50	2.08	0.819	0.98	1.13	16%	1.10	12%	0.76	-22.6%
0.6	15.0	0.20	0.60	2.08	0.819	0.88	0.96	9%	0.98	11%	0.66	-25.5%
0.6	15.0	0.20	0.70	2.08	0.819	0.77	0.79	2%	0.85	10%	0.58	-24.7%
0.6	15.0	0.20	0.80	2.08	0.819	0.54	0.62	14%	0.71	32%	0.53	-1.6%
0.6	15.0	0.30	0.10	3.32	0.804	2.67	2.91	9%	3.04	14%	2.81	5.2%
0.6	15.0	0.30	0.20	3.32	0.804	2.39	2.64	10%	2.54	6%	2.17	-9.3%
0.6	15.0	0.30	0.30	3.32	0.804	2.12	2.36	11%	2.24	6%	1.77	-16.6%
0.6	15.0	0.30	0.40	3.32	0.804	1.83	2.08	14%	2.01	10%	1.48	-18.9%
0.6	15.0	0.30	0.50	3.32	0.804	1.63	1.81	11%	1.81	11%	1.27	-22.1%
0.6	15.0	0.30	0.60	3.32	0.804	1.42	1.53	8%	1.62	14%	1.11	-22.0%
0.6	15.0	0.30	0.70	3.32	0.804	1.18	1.26	7%	1.42	20%	0.99	-16.1%
0.6	15.0	0.30	0.80	3.32	0.804	0.81	0.98	21%	1.20	48%	0.91	12.9%
0.6	15.0	0.50	0.10	6.06	0.817	5.21	5.31	2%	5.80	11%	5.35	2.7%
0.6	15.0	0.50	0.20	6.06	0.817	4.40	4.81	9%	4.77	8%	4.05	-7.9%
0.6	15.0	0.50	0.30	6.06	0.817	3.77	4.31	14%	4.15	10%	3.26	-13.5%
0.6	15.0	0.50	0.40	6.06	0.817	3.26	3.81	17%	3.69	13%	2.70	-17.1%
0.6	15.0	0.50	0.50	6.06	0.817	2.87	3.30	15%	3.29	15%	2.28	-20.5%
0.6	15.0	0.50	0.60	6.06	0.817	2.48	2.80	13%	2.91	18%	1.96	-20.9%
0.6	15.0	0.50	0.70	6.06	0.817	2.05	2.30	12%	2.52	23%	1.73	-15.6%
0.6	15.0	0.50	0.80	6.06	0.817	1.35	1.79	33%	2.11	56%	1.58	16.9%
0.6	15.0	0.65	0.10	8.27	0.836	7.13	7.25	2%	8.09	14%	7.44	4.4%
0.6	15.0	0.65	0.20	8.27	0.836	5.90	6.57	11%	6.57	11%	5.56	-5.8%
0.6	15.0	0.65	0.30	8.27	0.836	4.93	5.88	19%	5.67	15%	4.41	-10.5%
0.6	15.0	0.65	0.40	8.27	0.836	4.28	5.19	21%	4.99	17%	3.60	-15.8%
0.6	15.0	0.65	0.50	8.27	0.836	3.72	4.51	21%	4.42	19%	2.99	-19.5%
0.6	15.0	0.65	0.60	8.27	0.836	3.13	3.82	22%	3.87	24%	2.53	-19.2%
0.6	15.0	0.65	0.70	8.27	0.836	2.54	3.13	23%	3.30	30%	2.19	-13.9%
0.6	15.0	0.65	0.80	8.27	0.836	1.73	2.45	41%	2.70	56%	1.96	13.3%
0.6	15.0	0.80	0.10	10.51	0.841	9.02	9.22	2%	10.36	15%	9.53	5.6%
0.6	15.0	0.80	0.20	10.51	0.841	7.35	8.34	14%	8.39	14%	7.09	-3.6%
0.6	15.0	0.80	0.30	10.51	0.841	6.11	7.47	22%	7.22	18%	5.61	-8.2%
0.6	15.0	0.80	0.40	10.51	0.841	5.26	6.60	25%	6.34	21%	4.56	-13.2%
0.6	15.0	0.80	0.50	10.51	0.841	4.53	5.73	26%	5.60	24%	3.78	-16.7%
0.6	15.0	0.80	0.60	10.51	0.841	3.77	4.86	29%	4.88	30%	3.17	-15.8%
0.6	15.0	0.80	0.70	10.51	0.841	3.01	3.98	32%	4.15	38%	2.73	-9.4%
0.6	15.0	0.80	0.80	10.51	0.841	1.95	3.11	60%	3.38	73%	2.43	24.7%

β	γ	τ	a/T	SCF	DoB	FEM Y_{1a}	Ho's Y_{1a}	Ho's Diff	BSI's Y_{1a}	BSI's Diff	Mod Y_{1a}	Mod's Diff
0.6	15.0	1.00	0.10	13.45	0.846	11.49	11.80	3%	13.34	16%	12.27	6.8%
0.6	15.0	1.00	0.20	13.45	0.846	9.25	10.68	15%	10.77	17%	9.10	-1.6%
0.6	15.0	1.00	0.30	13.45	0.846	7.65	9.56	25%	9.25	21%	7.18	-6.1%
0.6	15.0	1.00	0.40	13.45	0.846	6.53	8.45	29%	8.12	24%	5.82	-10.8%
0.6	15.0	1.00	0.50	13.45	0.846	5.55	7.33	32%	7.14	29%	4.80	-13.6%
0.6	15.0	1.00	0.60	13.45	0.846	4.57	6.21	36%	6.21	36%	4.01	-12.2%
0.6	15.0	1.00	0.70	13.45	0.846	3.59	5.10	42%	5.26	47%	3.43	-4.5%
0.6	15.0	1.00	0.80	13.45	0.846	2.28	3.98	75%	4.26	87%	3.04	33.2%
0.6	20.0	0.20	0.10	2.51	0.812	1.83	2.20	20%	2.22	22%	2.05	12.0%
0.6	20.0	0.20	0.20	2.51	0.812	1.71	1.99	17%	1.87	9%	1.59	-6.9%
0.6	20.0	0.20	0.30	2.51	0.812	1.54	1.78	16%	1.65	7%	1.30	-15.6%
0.6	20.0	0.20	0.40	2.51	0.812	1.32	1.58	19%	1.49	13%	1.09	-17.4%
0.6	20.0	0.20	0.50	2.51	0.812	1.16	1.37	18%	1.34	15%	0.93	-19.7%
0.6	20.0	0.20	0.60	2.51	0.812	1.02	1.16	14%	1.20	17%	0.81	-20.7%
0.6	20.0	0.20	0.70	2.51	0.812	0.84	0.95	13%	1.04	24%	0.72	-14.2%
0.6	20.0	0.20	0.80	2.51	0.812	0.58	0.74	28%	0.88	52%	0.66	14.4%
0.6	20.0	0.40	0.10	5.89	0.831	4.98	5.17	4%	5.50	11%	5.06	1.7%
0.6	20.0	0.40	0.20	5.89	0.831	4.31	4.68	9%	4.54	5%	3.84	-10.9%
0.6	20.0	0.40	0.30	5.89	0.831	3.71	4.19	13%	3.95	6%	3.08	-17.0%
0.6	20.0	0.40	0.40	5.89	0.831	3.17	3.70	17%	3.50	11%	2.54	-20.0%
0.6	20.0	0.40	0.50	5.89	0.831	2.74	3.21	17%	3.12	14%	2.12	-22.5%
0.6	20.0	0.40	0.60	5.89	0.831	2.34	2.72	16%	2.75	17%	1.81	-22.7%
0.6	20.0	0.40	0.70	5.89	0.831	1.86	2.23	20%	2.36	27%	1.58	-15.2%
0.6	20.0	0.40	0.80	5.89	0.831	1.21	1.74	44%	1.95	61%	1.42	17.8%
0.6	20.0	0.60	0.10	9.74	0.847	8.26	8.54	3%	9.43	14%	8.66	4.8%
0.6	20.0	0.60	0.20	9.74	0.847	6.90	7.73	12%	7.65	11%	6.45	-6.5%
0.6	20.0	0.60	0.30	9.74	0.847	5.79	6.93	20%	6.59	14%	5.10	-11.9%
0.6	20.0	0.60	0.40	9.74	0.847	4.89	6.12	25%	5.80	19%	4.14	-15.3%
0.6	20.0	0.60	0.50	9.74	0.847	4.20	5.31	26%	5.11	22%	3.41	-18.7%
0.6	20.0	0.60	0.60	9.74	0.847	3.50	4.50	29%	4.45	27%	2.86	-18.4%
0.6	20.0	0.60	0.70	9.74	0.847	2.71	3.69	36%	3.77	39%	2.44	-9.8%
0.6	20.0	0.60	0.80	9.74	0.847	1.77	2.88	63%	3.06	73%	2.17	22.6%
0.6	20.0	0.80	0.10	13.71	0.853	11.49	12.02	5%	13.47	17%	12.37	7.6%
0.6	20.0	0.80	0.20	13.71	0.853	9.42	10.89	16%	10.87	15%	9.16	-2.8%
0.6	20.0	0.80	0.30	13.71	0.853	7.84	9.75	24%	9.33	19%	7.20	-8.1%
0.6	20.0	0.80	0.40	13.71	0.853	6.56	8.61	31%	8.17	25%	5.82	-11.3%
0.6	20.0	0.80	0.50	13.71	0.853	5.57	7.47	34%	7.18	29%	4.77	-14.4%
0.6	20.0	0.80	0.60	13.71	0.853	4.57	6.33	39%	6.22	36%	3.96	-13.3%
0.6	20.0	0.80	0.70	13.71	0.853	3.47	5.20	50%	5.25	51%	3.36	-3.1%
0.6	20.0	0.80	0.80	13.71	0.853	2.17	4.06	87%	4.22	94%	2.96	36.4%
0.6	20.0	1.00	0.10	17.68	0.858	14.71	15.51	5%	17.47	19%	16.04	9.1%
0.6	20.0	1.00	0.20	17.68	0.858	11.91	14.04	18%	14.07	18%	11.84	-0.6%

β	γ	τ	a/T	SCF	DoB	FEM Y_{1a}	Ho's Y_{1a}	Ho's Diff	BSI's Y_{1a}	BSI's Diff	Mod Y_{1a}	Mod's Diff
0.6	20.0	1.00	0.30	17.68	0.858	9.67	12.57	30%	12.04	25%	9.29	-3.9%
0.6	20.0	1.00	0.40	17.68	0.858	8.19	11.10	36%	10.53	29%	7.47	-8.7%
0.6	20.0	1.00	0.50	17.68	0.858	6.87	9.64	40%	9.22	34%	6.10	-11.2%
0.6	20.0	1.00	0.60	17.68	0.858	5.56	8.17	47%	7.97	43%	5.04	-9.4%
0.6	20.0	1.00	0.70	17.68	0.858	4.17	6.70	61%	6.69	61%	4.25	1.9%
0.6	20.0	1.00	0.80	17.68	0.858	2.55	5.23	105%	5.35	110%	3.72	45.8%
0.6	25.0	0.20	0.10	2.91	0.821	2.14	2.55	19%	2.57	20%	2.37	10.7%
0.6	25.0	0.20	0.20	2.91	0.821	1.95	2.31	18%	2.16	11%	1.83	-6.0%
0.6	25.0	0.20	0.30	2.91	0.821	1.66	2.07	25%	1.90	15%	1.49	-10.1%
0.6	25.0	0.20	0.40	2.91	0.821	1.46	1.83	25%	1.71	17%	1.24	-14.8%
0.6	25.0	0.20	0.50	2.91	0.821	1.28	1.59	24%	1.53	20%	1.06	-17.5%
0.6	25.0	0.20	0.60	2.91	0.821	1.11	1.34	21%	1.36	23%	0.91	-17.9%
0.6	25.0	0.20	0.70	2.91	0.821	0.89	1.10	24%	1.18	33%	0.80	-9.6%
0.6	25.0	0.20	0.80	2.91	0.821	0.60	0.86	44%	0.99	65%	0.74	22.6%
0.6	25.0	0.40	0.10	7.00	0.847	5.86	6.14	5%	6.52	11%	5.98	2.1%
0.6	25.0	0.40	0.20	7.00	0.847	5.01	5.56	11%	5.35	7%	4.51	-10.0%
0.6	25.0	0.40	0.30	7.00	0.847	4.26	4.98	17%	4.64	9%	3.59	-15.8%
0.6	25.0	0.40	0.40	7.00	0.847	3.57	4.40	23%	4.10	15%	2.92	-18.1%
0.6	25.0	0.40	0.50	7.00	0.847	3.06	3.82	25%	3.63	19%	2.42	-20.9%
0.6	25.0	0.40	0.60	7.00	0.847	2.57	3.23	26%	3.17	23%	2.03	-21.0%
0.6	25.0	0.40	0.70	7.00	0.847	2.01	2.65	32%	2.69	34%	1.74	-13.3%
0.6	25.0	0.40	0.80	7.00	0.847	1.32	2.07	57%	2.19	66%	1.55	17.5%
0.6	25.0	0.60	0.10	11.67	0.853	9.75	10.23	5%	11.28	16%	10.35	6.2%
0.6	25.0	0.60	0.20	11.67	0.853	8.05	9.27	15%	9.15	14%	7.69	-4.4%
0.6	25.0	0.60	0.30	11.67	0.853	6.72	8.30	23%	7.86	17%	6.07	-9.7%
0.6	25.0	0.60	0.40	11.67	0.853	5.58	7.33	31%	6.90	24%	4.90	-12.1%
0.6	25.0	0.60	0.50	11.67	0.853	4.75	6.36	34%	6.07	28%	4.02	-15.3%
0.6	25.0	0.60	0.60	11.67	0.853	3.91	5.39	38%	5.27	35%	3.35	-14.4%
0.6	25.0	0.60	0.70	11.67	0.853	3.00	4.42	47%	4.45	48%	2.84	-5.2%
0.6	25.0	0.60	0.80	11.67	0.853	1.95	3.45	77%	3.58	84%	2.51	28.7%
0.6	25.0	0.80	0.10	16.48	0.859	13.57	14.45	7%	16.16	19%	14.83	9.3%
0.6	25.0	0.80	0.20	16.48	0.859	11.07	13.09	18%	13.03	18%	10.95	-1.1%
0.6	25.0	0.80	0.30	16.48	0.859	9.15	11.72	28%	11.16	22%	8.59	-6.1%
0.6	25.0	0.80	0.40	16.48	0.859	7.55	10.35	37%	9.76	29%	6.91	-8.5%
0.6	25.0	0.80	0.50	16.48	0.859	6.36	8.98	41%	8.55	35%	5.63	-11.4%
0.6	25.0	0.80	0.60	16.48	0.859	5.16	7.61	48%	7.39	43%	4.65	-9.8%
0.6	25.0	0.80	0.70	16.48	0.859	3.89	6.25	61%	6.20	60%	3.92	0.8%
0.6	25.0	0.80	0.80	16.48	0.859	2.42	4.88	102%	4.95	105%	3.43	41.8%
0.6	25.0	1.00	0.10	21.33	0.864	17.49	18.71	7%	21.03	20%	19.30	10.3%
0.6	25.0	1.00	0.20	21.33	0.864	14.02	16.94	21%	16.92	21%	14.21	1.4%
0.6	25.0	1.00	0.30	21.33	0.864	11.55	15.17	31%	14.46	25%	11.12	-3.8%
0.6	25.0	1.00	0.40	21.33	0.864	9.47	13.40	41%	12.62	33%	8.91	-5.9%

β	γ	τ	a/T	SCF	DoB	FEM Y_{1a}	Ho's Y_{1a}	Ho's Diff	BSI's Y_{1a}	BSI's Diff	Mod Y_{1a}	Mod's Diff
0.6	25.0	1.00	0.50	21.33	0.864	7.87	11.62	48%	11.03	40%	7.23	-8.1%
0.6	25.0	1.00	0.60	21.33	0.864	6.32	9.85	56%	9.50	50%	5.94	-6.0%
0.6	25.0	1.00	0.70	21.33	0.864	4.70	8.08	72%	7.94	69%	4.97	5.8%
0.6	25.0	1.00	0.80	21.33	0.864	2.84	6.31	122%	6.30	122%	4.32	52.1%
0.6	30.0	0.20	0.10	3.23	0.825	2.39	2.83	19%	2.85	19%	2.63	9.9%
0.6	30.0	0.20	0.20	3.23	0.825	2.10	2.56	22%	2.39	14%	2.03	-3.4%
0.6	30.0	0.20	0.30	3.23	0.825	1.81	2.30	27%	2.11	16%	1.65	-9.0%
0.6	30.0	0.20	0.40	3.23	0.825	1.53	2.03	33%	1.89	23%	1.37	-10.4%
0.6	30.0	0.20	0.50	3.23	0.825	1.35	1.76	30%	1.69	25%	1.16	-14.1%
0.6	30.0	0.20	0.60	3.23	0.825	1.15	1.49	30%	1.50	31%	1.00	-13.3%
0.6	30.0	0.20	0.70	3.23	0.825	0.92	1.22	33%	1.30	41%	0.88	-4.5%
0.6	30.0	0.20	0.80	3.23	0.825	0.62	0.96	54%	1.08	75%	0.80	29.1%
0.6	30.0	0.40	0.10	7.96	0.849	6.60	6.98	6%	7.41	12%	6.80	3.0%
0.6	30.0	0.40	0.20	7.96	0.849	5.53	6.32	14%	6.08	10%	5.12	-7.5%
0.6	30.0	0.40	0.30	7.96	0.849	4.62	5.66	23%	5.27	14%	4.07	-11.9%
0.6	30.0	0.40	0.40	7.96	0.849	3.80	5.00	32%	4.65	22%	3.31	-12.8%
0.6	30.0	0.40	0.50	7.96	0.849	3.24	4.34	34%	4.11	27%	2.74	-15.5%
0.6	30.0	0.40	0.60	7.96	0.849	2.70	3.68	36%	3.59	33%	2.29	-15.1%
0.6	30.0	0.40	0.70	7.96	0.849	2.09	3.02	44%	3.04	46%	1.96	-6.1%
0.6	30.0	0.40	0.80	7.96	0.849	1.37	2.36	72%	2.47	80%	1.74	27.2%
0.6	30.0	0.60	0.10	13.31	0.855	11.11	11.67	5%	12.86	16%	11.80	6.2%
0.6	30.0	0.60	0.20	13.31	0.855	8.94	10.57	18%	10.42	17%	8.76	-2.0%
0.6	30.0	0.60	0.30	13.31	0.855	7.37	9.46	28%	8.96	22%	6.90	-6.4%
0.6	30.0	0.60	0.40	13.31	0.855	6.02	8.36	39%	7.86	31%	5.57	-7.4%
0.6	30.0	0.60	0.50	13.31	0.855	5.10	7.25	42%	6.90	35%	4.56	-10.5%
0.6	30.0	0.60	0.60	13.31	0.855	4.18	6.15	47%	5.99	43%	3.79	-9.4%
0.6	30.0	0.60	0.70	13.31	0.855	3.19	5.04	58%	5.04	58%	3.21	0.7%
0.6	30.0	0.60	0.80	13.31	0.855	2.06	3.94	91%	4.05	97%	2.83	37.3%
0.6	30.0	0.80	0.10	18.84	0.862	15.47	16.52	7%	18.46	19%	16.93	9.4%
0.6	30.0	0.80	0.20	18.84	0.862	12.29	14.96	22%	14.88	21%	12.49	1.6%
0.6	30.0	0.80	0.30	18.84	0.862	10.10	13.40	33%	12.73	26%	9.78	-3.1%
0.6	30.0	0.80	0.40	18.84	0.862	8.21	11.83	44%	11.12	36%	7.85	-4.4%
0.6	30.0	0.80	0.50	18.84	0.862	6.87	10.27	49%	9.73	42%	6.39	-7.0%
0.6	30.0	0.80	0.60	18.84	0.862	5.55	8.70	57%	8.40	51%	5.26	-5.3%
0.6	30.0	0.80	0.70	18.84	0.862	4.17	7.14	71%	7.03	69%	4.42	5.9%
0.6	30.0	0.80	0.80	18.84	0.862	2.59	5.58	115%	5.60	116%	3.85	48.6%
0.6	30.0	1.00	0.10	24.45	0.867	19.98	21.44	7%	24.08	21%	22.09	10.6%
0.6	30.0	1.00	0.20	24.45	0.867	15.65	19.41	24%	19.36	24%	16.25	3.8%
0.6	30.0	1.00	0.30	24.45	0.867	12.81	17.38	36%	16.54	29%	12.69	-0.9%
0.6	30.0	1.00	0.40	24.45	0.867	10.33	15.35	49%	14.42	40%	10.15	-1.8%
0.6	30.0	1.00	0.50	24.45	0.867	8.56	13.33	56%	12.59	47%	8.22	-4.0%
0.6	30.0	1.00	0.60	24.45	0.867	6.83	11.30	65%	10.83	59%	6.73	-1.5%

β	γ	τ	a/T	SCF	DoB	FEM Y_{1a}	Ho's Y_{1a}	Ho's Diff	BSI's Y_{1a}	BSI's Diff	Mod Y_{1a}	Mod's Diff
0.6	30.0	1.00	0.70	24.45	0.867	5.05	9.27	83%	9.03	79%	5.61	11.1%
0.6	30.0	1.00	0.80	24.45	0.867	3.06	7.24	137%	7.14	133%	4.86	58.7%
0.6	35.0	0.20	0.10	3.50	0.826	2.19	3.07	40%	3.09	41%	2.84	29.9%
0.6	35.0	0.20	0.20	3.50	0.826	2.34	2.78	19%	2.59	11%	2.20	-6.1%
0.6	35.0	0.20	0.30	3.50	0.826	2.05	2.49	21%	2.28	11%	1.78	-13.0%
0.6	35.0	0.20	0.40	3.50	0.826	1.79	2.20	23%	2.04	14%	1.48	-17.1%
0.6	35.0	0.20	0.50	3.50	0.826	1.54	1.91	24%	1.83	19%	1.25	-18.6%
0.6	35.0	0.20	0.60	3.50	0.826	1.29	1.62	25%	1.62	26%	1.08	-16.5%
0.6	35.0	0.20	0.70	3.50	0.826	1.02	1.33	30%	1.41	38%	0.95	-7.1%
0.6	35.0	0.20	0.80	3.50	0.826	0.64	1.04	62%	1.17	83%	0.86	34.8%
0.6	35.0	0.40	0.10	8.75	0.850	6.28	7.67	22%	8.14	30%	7.47	19.0%
0.6	35.0	0.40	0.20	8.75	0.850	6.23	6.95	12%	6.68	7%	5.62	-9.8%
0.6	35.0	0.40	0.30	8.75	0.850	5.27	6.22	18%	5.79	10%	4.47	-15.2%
0.6	35.0	0.40	0.40	8.75	0.850	4.45	5.50	23%	5.11	15%	3.64	-18.3%
0.6	35.0	0.40	0.50	8.75	0.850	3.78	4.77	26%	4.51	19%	3.00	-20.6%
0.6	35.0	0.40	0.60	8.75	0.850	3.08	4.04	31%	3.94	28%	2.51	-18.5%
0.6	35.0	0.40	0.70	8.75	0.850	2.31	3.32	44%	3.34	45%	2.15	-7.1%
0.6	35.0	0.40	0.80	8.75	0.850	1.39	2.59	86%	2.70	94%	1.91	37.1%
0.6	35.0	0.60	0.10	14.71	0.856	10.41	12.90	24%	14.20	36%	13.03	25.2%
0.6	35.0	0.60	0.20	14.71	0.856	10.08	11.68	16%	11.51	14%	9.67	-4.0%
0.6	35.0	0.60	0.30	14.71	0.856	8.50	10.46	23%	9.89	16%	7.62	-10.4%
0.6	35.0	0.60	0.40	14.71	0.856	7.13	9.24	30%	8.67	22%	6.15	-13.8%
0.6	35.0	0.60	0.50	14.71	0.856	6.00	8.02	34%	7.62	27%	5.03	-16.2%
0.6	35.0	0.60	0.60	14.71	0.856	4.87	6.80	40%	6.60	36%	4.17	-14.3%
0.6	35.0	0.60	0.70	14.71	0.856	3.62	5.58	54%	5.56	54%	3.53	-2.4%
0.6	35.0	0.60	0.80	14.71	0.856	2.19	4.35	99%	4.46	104%	3.11	41.9%
0.6	35.0	0.80	0.10	20.86	0.863	14.78	18.29	24%	20.43	38%	18.74	26.8%
0.6	35.0	0.80	0.20	20.86	0.863	14.09	16.56	18%	16.46	17%	13.82	-1.9%
0.6	35.0	0.80	0.30	20.86	0.863	11.76	14.83	26%	14.09	20%	10.82	-8.0%
0.6	35.0	0.80	0.40	20.86	0.863	9.86	13.10	33%	12.30	25%	8.68	-12.0%
0.6	35.0	0.80	0.50	20.86	0.863	8.25	11.37	38%	10.76	31%	7.05	-14.5%
0.6	35.0	0.80	0.60	20.86	0.863	6.60	9.64	46%	9.28	41%	5.80	-12.1%
0.6	35.0	0.80	0.70	20.86	0.863	4.82	7.91	64%	7.77	61%	4.86	0.9%
0.6	35.0	0.80	0.80	20.86	0.863	2.68	6.17	130%	6.17	130%	4.24	58.1%
0.6	35.0	1.00	0.10	27.11	0.869	19.36	23.78	23%	26.68	38%	24.47	26.4%
0.6	35.0	1.00	0.20	27.11	0.869	18.20	21.53	18%	21.45	18%	17.99	-1.2%
0.6	35.0	1.00	0.30	27.11	0.869	15.20	19.28	27%	18.31	21%	14.03	-7.7%
0.6	35.0	1.00	0.40	27.11	0.869	12.66	17.03	34%	15.95	26%	11.21	-11.5%
0.6	35.0	1.00	0.50	27.11	0.869	10.39	14.77	42%	13.91	34%	9.06	-12.8%
0.6	35.0	1.00	0.60	27.11	0.869	8.24	12.52	52%	11.96	45%	7.40	-10.2%
0.6	35.0	1.00	0.70	27.11	0.869	5.90	10.27	74%	9.95	69%	6.16	4.3%
0.6	35.0	1.00	0.80	27.11	0.869	3.15	8.02	155%	7.85	149%	5.31	68.7%

β	γ	τ	a/T	SCF	DoB	FEM Y_{1a}	Ho's Y_{1a}	Ho's Diff	BSI's Y_{1a}	BSI's Diff	Mod Y_{1a}	Mod's Diff
0.8	10.0	0.30	0.10	2.07	0.727	1.52	1.82	19%	1.93	27%	1.80	18.1%
0.8	10.0	0.30	0.20	2.07	0.727	1.38	1.64	19%	1.64	19%	1.43	3.3%
0.8	10.0	0.30	0.30	2.07	0.727	1.26	1.47	17%	1.47	16%	1.20	-4.6%
0.8	10.0	0.30	0.40	2.07	0.727	1.15	1.30	13%	1.34	17%	1.05	-8.8%
0.8	10.0	0.30	0.50	2.07	0.727	1.07	1.13	5%	1.24	16%	0.94	-12.3%
0.8	10.0	0.30	0.60	2.07	0.727	1.01	0.96	-5%	1.15	13%	0.86	-15.0%
0.8	10.0	0.65	0.10	4.71	0.747	3.71	4.13	11%	4.71	27%	4.38	18.2%
0.8	10.0	0.65	0.20	4.71	0.747	3.17	3.74	18%	3.90	23%	3.38	6.7%
0.8	10.0	0.65	0.30	4.71	0.747	2.81	3.35	19%	3.43	22%	2.79	-0.5%
0.8	10.0	0.65	0.40	4.71	0.747	2.51	2.96	18%	3.10	24%	2.39	-4.6%
0.8	10.0	0.65	0.50	4.71	0.747	2.29	2.57	12%	2.83	24%	2.10	-8.1%
0.8	10.0	0.65	0.60	4.71	0.747	2.07	2.18	5%	2.57	24%	1.89	-8.6%
0.8	10.0	1.00	0.10	7.41	0.761	5.94	6.50	9%	7.57	27%	7.04	18.5%
0.8	10.0	1.00	0.20	7.41	0.761	4.94	5.88	19%	6.21	26%	5.38	8.9%
0.8	10.0	1.00	0.30	7.41	0.761	4.32	5.27	22%	5.43	26%	4.41	2.0%
0.8	10.0	1.00	0.40	7.41	0.761	3.81	4.65	22%	4.88	28%	3.74	-1.8%
0.8	10.0	1.00	0.50	7.41	0.761	3.41	4.04	18%	4.42	30%	3.26	-4.4%
0.8	10.0	1.00	0.60	7.41	0.761	3.04	3.42	13%	3.99	31%	2.90	-4.5%
0.8	15.0	0.30	0.10	2.51	0.770	1.99	2.20	11%	2.32	16%	2.15	7.9%
0.8	15.0	0.30	0.20	2.51	0.770	1.85	1.99	8%	1.95	5%	1.68	-9.3%
0.8	15.0	0.30	0.30	2.51	0.770	1.64	1.78	9%	1.73	5%	1.39	-15.2%
0.8	15.0	0.30	0.40	2.51	0.770	1.44	1.58	9%	1.57	9%	1.19	-17.5%
0.8	15.0	0.30	0.50	2.51	0.770	1.29	1.37	6%	1.43	11%	1.04	-19.5%
0.8	15.0	0.30	0.60	2.51	0.770	1.15	1.16	1%	1.30	13%	0.93	-19.4%
0.8	15.0	0.30	0.70	2.51	0.770	0.97	0.95	-2%	1.16	19%	0.85	-12.5%
0.8	15.0	0.30	0.80	2.51	0.770	0.73	0.74	2%	1.01	38%	0.80	9.5%
0.8	15.0	0.65	0.10	6.33	0.800	5.55	5.55	0%	6.25	13%	5.78	4.1%
0.8	15.0	0.65	0.20	6.33	0.800	4.83	5.03	4%	5.12	6%	4.37	-9.5%
0.8	15.0	0.65	0.30	6.33	0.800	4.17	4.50	8%	4.45	7%	3.53	-15.3%
0.8	15.0	0.65	0.40	6.33	0.800	3.57	3.98	11%	3.96	11%	2.94	-17.6%
0.8	15.0	0.65	0.50	6.33	0.800	3.14	3.45	10%	3.55	13%	2.51	-20.1%
0.8	15.0	0.65	0.60	6.33	0.800	2.69	2.92	9%	3.16	18%	2.18	-18.9%
0.8	15.0	0.65	0.70	6.33	0.800	2.18	2.40	10%	2.76	27%	1.95	-10.8%
0.8	15.0	0.65	0.80	6.33	0.800	1.55	1.87	21%	2.34	51%	1.79	15.7%
0.8	15.0	1.00	0.10	10.16	0.811	9.33	8.91	-4%	10.20	9%	9.43	1.0%
0.8	15.0	1.00	0.20	10.16	0.811	7.90	8.07	2%	8.29	5%	7.08	-10.4%
0.8	15.0	1.00	0.30	10.16	0.811	6.71	7.22	8%	7.18	7%	5.68	-15.4%
0.8	15.0	1.00	0.40	10.16	0.811	5.68	6.38	12%	6.36	12%	4.70	-17.3%
0.8	15.0	1.00	0.50	10.16	0.811	4.90	5.54	13%	5.67	16%	3.97	-19.0%
0.8	15.0	1.00	0.60	10.16	0.811	4.11	4.69	14%	5.01	22%	3.42	-16.8%
0.8	15.0	1.00	0.70	10.16	0.811	3.26	3.85	18%	4.35	33%	3.02	-7.4%
0.8	15.0	1.00	0.80	10.16	0.811	2.25	3.01	34%	3.64	62%	2.75	22.3%

β	γ	τ	a/T	SCF	DoB	FEM Y_{Ia}	Ho's Y_{Ia}	Ho's Diff	BSI's Y_{Ia}	BSI's Diff	Mod Y_{Ia}	Mod's Diff
0.8	20.0	0.30	0.10	3.06	0.792	2.21	2.68	21%	2.81	27%	2.60	17.6%
0.8	20.0	0.30	0.20	3.06	0.792	2.05	2.43	19%	2.35	15%	2.01	-1.7%
0.8	20.0	0.30	0.30	3.06	0.792	1.82	2.18	20%	2.08	14%	1.65	-9.2%
0.8	20.0	0.30	0.40	3.06	0.792	1.60	1.92	20%	1.87	17%	1.40	-12.8%
0.8	20.0	0.30	0.50	3.06	0.792	1.32	1.67	26%	1.69	28%	1.20	-8.8%
0.8	20.0	0.30	0.60	3.06	0.792	1.14	1.41	24%	1.52	33%	1.06	-7.1%
0.8	20.0	0.30	0.70	3.06	0.792	0.91	1.16	27%	1.34	47%	0.96	5.0%
0.8	20.0	0.30	0.80	3.06	0.792	0.64	0.91	42%	1.15	79%	0.89	39.0%
0.8	20.0	0.65	0.10	8.04	0.825	7.08	7.05	0%	7.89	11%	7.27	2.7%
0.8	20.0	0.65	0.20	8.04	0.825	6.24	6.38	2%	6.42	3%	5.45	-12.7%
0.8	20.0	0.65	0.30	8.04	0.825	5.29	5.72	8%	5.55	5%	4.35	-17.8%
0.8	20.0	0.65	0.40	8.04	0.825	4.52	5.05	12%	4.91	9%	3.57	-20.9%
0.8	20.0	0.65	0.50	8.04	0.825	3.74	4.38	17%	4.36	17%	2.99	-19.9%
0.8	20.0	0.65	0.60	8.04	0.825	3.10	3.71	20%	3.84	24%	2.55	-17.6%
0.8	20.0	0.65	0.70	8.04	0.825	2.39	3.05	27%	3.30	38%	2.23	-6.6%
0.8	20.0	0.65	0.80	8.04	0.825	1.55	2.38	54%	2.73	76%	2.02	30.3%
0.8	20.0	1.00	0.10	13.55	0.834	12.56	11.88	-5%	13.50	8%	12.44	-1.0%
0.8	20.0	1.00	0.20	13.55	0.834	10.53	10.76	2%	10.92	4%	9.26	-12.0%
0.8	20.0	1.00	0.30	13.55	0.834	8.83	9.63	9%	9.40	7%	7.35	-16.7%
0.8	20.0	1.00	0.40	13.55	0.834	7.25	8.51	17%	8.28	14%	6.00	-17.2%
0.8	20.0	1.00	0.50	13.55	0.834	6.08	7.38	21%	7.32	20%	4.99	-17.9%
0.8	20.0	1.00	0.60	13.55	0.834	4.92	6.26	27%	6.41	30%	4.22	-14.2%
0.8	20.0	1.00	0.70	13.55	0.834	3.69	5.14	39%	5.47	48%	3.65	-1.1%
0.8	20.0	1.00	0.80	13.55	0.834	2.30	4.01	74%	4.48	95%	3.27	42.1%

Table E4

Comparison with Simplified Methods for a/c=0.4

β	γ	τ	a/T	SCF	DoB	FEM Y_{1a}	Ho's Y_{1a}	Ho's Diff	BSI's Y_{1a}	BSI's Diff	Mod Y_{1a}	Mod's Diff
0.6	10.0	0.20	0.10	1.61	0.765	0.99	1.27	28%	1.35	37%	1.26	26.8%
0.6	10.0	0.20	0.20	1.61	0.765	0.92	1.14	24%	1.14	24%	0.98	6.9%
0.6	10.0	0.20	0.30	1.61	0.765	0.81	1.01	25%	1.00	24%	0.81	-0.2%
0.6	10.0	0.20	0.40	1.61	0.765	0.70	0.88	26%	0.89	28%	0.68	-2.5%
0.6	10.0	0.20	0.50	1.61	0.765	0.62	0.75	21%	0.80	29%	0.59	-5.2%
0.6	10.0	0.20	0.60	1.61	0.765	0.56	0.62	10%	0.71	26%	0.52	-7.6%
0.6	10.0	0.20	0.70	1.61	0.765	0.47	0.49	4%	0.61	30%	0.47	-0.4%
0.6	10.0	0.20	0.80	1.61	0.765	0.35	0.36	2%	0.51	45%	0.44	25.2%
0.6	10.0	0.40	0.10	3.46	0.780	2.42	2.73	13%	3.08	27%	2.85	17.7%
0.6	10.0	0.40	0.20	3.46	0.780	2.11	2.45	16%	2.54	20%	2.18	3.4%
0.6	10.0	0.40	0.30	3.46	0.780	1.82	2.17	19%	2.20	21%	1.76	-3.1%
0.6	10.0	0.40	0.40	3.46	0.780	1.59	1.89	19%	1.94	22%	1.47	-7.8%
0.6	10.0	0.40	0.50	3.46	0.780	1.40	1.61	15%	1.71	22%	1.25	-11.1%
0.6	10.0	0.40	0.60	3.46	0.780	1.19	1.33	12%	1.50	26%	1.08	-9.2%
0.6	10.0	0.40	0.70	3.46	0.780	0.96	1.05	9%	1.27	33%	0.96	0.3%
0.6	10.0	0.40	0.80	3.46	0.780	0.66	0.77	16%	1.04	58%	0.89	35.0%
0.6	10.0	0.60	0.10	5.38	0.790	3.94	4.24	8%	4.97	26%	4.60	16.7%
0.6	10.0	0.60	0.20	5.38	0.790	3.31	3.81	15%	4.04	22%	3.47	4.7%
0.6	10.0	0.60	0.30	5.38	0.790	2.76	3.37	22%	3.47	26%	2.77	0.5%
0.6	10.0	0.60	0.40	5.38	0.790	2.38	2.94	23%	3.04	28%	2.28	-4.1%
0.6	10.0	0.60	0.50	5.38	0.790	2.06	2.50	21%	2.66	29%	1.92	-6.9%
0.6	10.0	0.60	0.60	5.38	0.790	1.79	2.07	15%	2.31	29%	1.65	-8.0%
0.6	10.0	0.60	0.70	5.38	0.790	1.44	1.63	13%	1.95	35%	1.45	0.9%
0.6	10.0	0.60	0.80	5.38	0.790	0.99	1.19	21%	1.57	59%	1.33	34.7%
0.6	10.0	0.80	0.10	7.30	0.797	5.41	5.76	6%	6.86	27%	6.35	17.3%
0.6	10.0	0.80	0.20	7.30	0.797	4.45	5.17	16%	5.55	25%	4.75	6.8%
0.6	10.0	0.80	0.30	7.30	0.797	3.68	4.58	24%	4.74	29%	3.78	2.7%
0.6	10.0	0.80	0.40	7.30	0.797	3.14	3.99	27%	4.13	32%	3.09	-1.5%
0.6	10.0	0.80	0.50	7.30	0.797	2.67	3.39	27%	3.61	35%	2.58	-3.3%
0.6	10.0	0.80	0.60	7.30	0.797	2.26	2.80	24%	3.11	38%	2.20	-2.5%
0.6	10.0	0.80	0.70	7.30	0.797	1.74	2.21	27%	2.61	50%	1.93	11.0%
0.6	10.0	0.80	0.80	7.30	0.797	1.16	1.62	40%	2.09	80%	1.76	51.7%
0.6	10.0	1.00	0.10	9.17	0.802	6.86	7.24	5%	8.69	27%	8.04	17.2%
0.6	10.0	1.00	0.20	9.17	0.802	5.45	6.49	19%	7.00	29%	6.00	10.1%
0.6	10.0	1.00	0.30	9.17	0.802	4.55	5.75	26%	5.98	31%	4.76	4.6%
0.6	10.0	1.00	0.40	9.17	0.802	3.85	5.01	30%	5.20	35%	3.88	0.8%
0.6	10.0	1.00	0.50	9.17	0.802	3.24	4.26	32%	4.52	40%	3.23	-0.4%
0.6	10.0	1.00	0.60	9.17	0.802	2.70	3.52	30%	3.89	44%	2.74	1.5%

β	γ	τ	a/T	SCF	DoB	FEM Y_{1a}	Ho's Y_{1a}	Ho's Diff	BSI's Y_{1a}	BSI's Diff	Mod Y_{1a}	Mod's Diff
0.6	10.0	1.00	0.70	9.17	0.802	2.06	2.78	35%	3.24	58%	2.39	16.0%
0.6	10.0	1.00	0.80	9.17	0.802	1.31	2.04	55%	2.58	97%	2.17	65.4%
0.6	15.0	0.20	0.10	2.08	0.819	1.32	1.64	24%	1.73	31%	1.59	20.8%
0.6	15.0	0.20	0.20	2.08	0.819	1.26	1.47	17%	1.44	14%	1.22	-3.0%
0.6	15.0	0.20	0.30	2.08	0.819	1.13	1.30	15%	1.25	11%	0.98	-13.3%
0.6	15.0	0.20	0.40	2.08	0.819	0.95	1.14	20%	1.10	15%	0.80	-15.5%
0.6	15.0	0.20	0.50	2.08	0.819	0.81	0.97	19%	0.96	18%	0.67	-17.7%
0.6	15.0	0.20	0.60	2.08	0.819	0.70	0.80	14%	0.82	18%	0.56	-19.5%
0.6	15.0	0.20	0.70	2.08	0.819	0.56	0.63	13%	0.68	22%	0.49	-12.6%
0.6	15.0	0.20	0.80	2.08	0.819	0.36	0.46	28%	0.54	50%	0.44	23.0%
0.6	15.0	0.30	0.10	3.32	0.804	2.38	2.62	10%	2.86	20%	2.64	11.0%
0.6	15.0	0.30	0.20	3.32	0.804	2.15	2.35	9%	2.37	10%	2.02	-6.1%
0.6	15.0	0.30	0.30	3.32	0.804	1.91	2.08	9%	2.05	7%	1.62	-15.1%
0.6	15.0	0.30	0.40	3.32	0.804	1.58	1.81	15%	1.80	14%	1.33	-15.6%
0.6	15.0	0.30	0.50	3.32	0.804	1.35	1.54	14%	1.58	17%	1.12	-17.2%
0.6	15.0	0.30	0.60	3.32	0.804	1.14	1.27	12%	1.36	20%	0.95	-16.3%
0.6	15.0	0.30	0.70	3.32	0.804	0.88	1.01	14%	1.14	30%	0.84	-4.9%
0.6	15.0	0.30	0.80	3.32	0.804	0.55	0.74	34%	0.91	66%	0.76	39.0%
0.6	15.0	0.50	0.10	6.06	0.817	4.63	4.78	3%	5.46	18%	5.03	8.7%
0.6	15.0	0.50	0.20	6.06	0.817	4.02	4.29	7%	4.44	10%	3.77	-6.1%
0.6	15.0	0.50	0.30	6.06	0.817	3.41	3.80	11%	3.80	11%	2.99	-12.3%
0.6	15.0	0.50	0.40	6.06	0.817	2.83	3.31	17%	3.31	17%	2.43	-14.2%
0.6	15.0	0.50	0.50	6.06	0.817	2.41	2.82	17%	2.87	19%	2.01	-16.8%
0.6	15.0	0.50	0.60	6.06	0.817	2.02	2.33	15%	2.46	22%	1.69	-16.4%
0.6	15.0	0.50	0.70	6.06	0.817	1.53	1.84	20%	2.03	33%	1.46	-4.6%
0.6	15.0	0.50	0.80	6.06	0.817	0.93	1.35	45%	1.60	72%	1.32	41.5%
0.6	15.0	0.65	0.10	8.27	0.836	6.37	6.53	2%	7.61	20%	7.01	10.0%
0.6	15.0	0.65	0.20	8.27	0.836	5.39	5.86	9%	6.12	14%	5.18	-4.0%
0.6	15.0	0.65	0.30	8.27	0.836	4.39	5.19	18%	5.19	18%	4.04	-7.9%
0.6	15.0	0.65	0.40	8.27	0.836	3.73	4.52	21%	4.47	20%	3.24	-13.2%
0.6	15.0	0.65	0.50	8.27	0.836	3.14	3.85	22%	3.85	23%	2.63	-16.3%
0.6	15.0	0.65	0.60	8.27	0.836	2.55	3.18	25%	3.25	27%	2.17	-14.9%
0.6	15.0	0.65	0.70	8.27	0.836	1.87	2.51	34%	2.64	41%	1.84	-1.7%
0.6	15.0	0.65	0.80	8.27	0.836	1.10	1.84	67%	2.02	84%	1.63	48.0%
0.6	15.0	0.80	0.10	10.51	0.841	8.04	8.29	3%	9.75	21%	8.97	11.5%
0.6	15.0	0.80	0.20	10.51	0.841	6.73	7.44	11%	7.81	16%	6.60	-1.9%
0.6	15.0	0.80	0.30	10.51	0.841	5.45	6.59	21%	6.61	21%	5.14	-5.7%
0.6	15.0	0.80	0.40	10.51	0.841	4.61	5.74	24%	5.68	23%	4.10	-11.1%
0.6	15.0	0.80	0.50	10.51	0.841	3.83	4.89	28%	4.87	27%	3.31	-13.5%
0.6	15.0	0.80	0.60	10.51	0.841	3.07	4.04	31%	4.10	34%	2.72	-11.4%
0.6	15.0	0.80	0.70	10.51	0.841	2.22	3.18	43%	3.32	50%	2.29	3.2%
0.6	15.0	0.80	0.80	10.51	0.841	1.25	2.33	87%	2.52	101%	2.02	61.3%

β	γ	τ	a/T	SCF	DoB	FEM Y_{1a}	Ho's Y_{1a}	Ho's Diff	BSI's Y_{1a}	BSI's Diff	Mod Y_{1a}	Mod's Diff
0.6	15.0	1.00	0.10	13.45	0.846	10.33	10.61	3%	12.56	22%	11.55	11.8%
0.6	15.0	1.00	0.20	13.45	0.846	8.48	9.52	12%	10.03	18%	8.48	-0.0%
0.6	15.0	1.00	0.30	13.45	0.846	6.86	8.43	23%	8.47	23%	6.58	-4.0%
0.6	15.0	1.00	0.40	13.45	0.846	5.74	7.34	28%	7.26	27%	5.23	-8.9%
0.6	15.0	1.00	0.50	13.45	0.846	4.72	6.25	33%	6.21	32%	4.21	-10.8%
0.6	15.0	1.00	0.60	13.45	0.846	3.72	5.16	39%	5.21	40%	3.44	-7.6%
0.6	15.0	1.00	0.70	13.45	0.846	2.64	4.08	54%	4.20	59%	2.88	8.9%
0.6	15.0	1.00	0.80	13.45	0.846	1.42	2.99	110%	3.16	122%	2.51	77.1%
0.6	20.0	0.20	0.10	2.51	0.812	1.62	1.98	22%	2.09	29%	1.93	19.0%
0.6	20.0	0.20	0.20	2.51	0.812	1.53	1.78	16%	1.74	14%	1.48	-3.1%
0.6	20.0	0.20	0.30	2.51	0.812	1.35	1.57	17%	1.51	12%	1.19	-11.7%
0.6	20.0	0.20	0.40	2.51	0.812	1.12	1.37	22%	1.33	19%	0.98	-12.4%
0.6	20.0	0.20	0.50	2.51	0.812	0.96	1.17	22%	1.17	22%	0.82	-14.7%
0.6	20.0	0.20	0.60	2.51	0.812	0.80	0.96	20%	1.01	26%	0.70	-12.9%
0.6	20.0	0.20	0.70	2.51	0.812	0.62	0.76	23%	0.84	36%	0.61	-1.9%
0.6	20.0	0.20	0.80	2.51	0.812	0.38	0.56	47%	0.67	76%	0.55	45.7%
0.6	20.0	0.40	0.10	5.89	0.831	4.40	4.65	6%	5.18	18%	4.76	8.3%
0.6	20.0	0.40	0.20	5.89	0.831	3.90	4.17	7%	4.22	8%	3.57	-8.3%
0.6	20.0	0.40	0.30	5.89	0.831	3.31	3.69	12%	3.61	9%	2.82	-14.7%
0.6	20.0	0.40	0.40	5.89	0.831	2.69	3.22	20%	3.14	17%	2.28	-15.3%
0.6	20.0	0.40	0.50	5.89	0.831	2.27	2.74	21%	2.72	20%	1.87	-17.8%
0.6	20.0	0.40	0.60	5.89	0.831	1.87	2.26	21%	2.31	23%	1.55	-17.0%
0.6	20.0	0.40	0.70	5.89	0.831	1.38	1.78	29%	1.89	37%	1.33	-3.8%
0.6	20.0	0.40	0.80	5.89	0.831	0.81	1.31	61%	1.46	80%	1.18	46.2%
0.6	20.0	0.60	0.10	9.74	0.847	7.28	7.68	6%	8.87	22%	8.15	11.9%
0.6	20.0	0.60	0.20	9.74	0.847	6.25	6.90	10%	7.13	14%	6.01	-3.9%
0.6	20.0	0.60	0.30	9.74	0.847	5.21	6.11	17%	6.03	16%	4.67	-10.3%
0.6	20.0	0.60	0.40	9.74	0.847	4.21	5.32	26%	5.19	23%	3.72	-11.7%
0.6	20.0	0.60	0.50	9.74	0.847	3.51	4.53	29%	4.44	27%	2.99	-14.7%
0.6	20.0	0.60	0.60	9.74	0.847	2.82	3.74	33%	3.73	32%	2.45	-13.3%
0.6	20.0	0.60	0.70	9.74	0.847	2.06	2.95	43%	3.01	46%	2.05	-0.5%
0.6	20.0	0.60	0.80	9.74	0.847	1.22	2.16	77%	2.26	85%	1.80	47.2%
0.6	20.0	0.80	0.10	13.71	0.853	10.16	10.82	6%	12.67	25%	11.64	14.5%
0.6	20.0	0.80	0.20	13.71	0.853	8.56	9.71	13%	10.12	18%	8.53	-0.4%
0.6	20.0	0.80	0.30	13.71	0.853	7.11	8.60	21%	8.54	20%	6.60	-7.2%
0.6	20.0	0.80	0.40	13.71	0.853	5.71	7.49	31%	7.31	28%	5.22	-8.6%
0.6	20.0	0.80	0.50	13.71	0.853	4.70	6.38	36%	6.24	33%	4.18	-11.1%
0.6	20.0	0.80	0.60	13.71	0.853	3.70	5.26	42%	5.21	41%	3.39	-8.4%
0.6	20.0	0.80	0.70	13.71	0.853	2.63	4.15	58%	4.17	59%	2.81	7.0%
0.6	20.0	0.80	0.80	13.71	0.853	1.42	3.04	114%	3.11	119%	2.45	72.3%
0.6	20.0	1.00	0.10	17.68	0.858	13.04	13.95	7%	16.44	26%	15.10	15.8%
0.6	20.0	1.00	0.20	17.68	0.858	10.85	12.52	15%	13.10	21%	11.03	1.6%

β	γ	τ	a/T	SCF	DoB	FEM Y_{1a}	Ho's Y_{1a}	Ho's Diff	BSI's Y_{1a}	BSI's Diff	Mod Y_{1a}	Mod's Diff
0.6	20.0	1.00	0.30	17.68	0.858	8.60	11.09	29%	11.02	28%	8.51	-1.0%
0.6	20.0	1.00	0.40	17.68	0.858	7.15	9.65	35%	9.42	32%	6.71	-6.2%
0.6	20.0	1.00	0.50	17.68	0.858	5.83	8.22	41%	8.02	38%	5.34	-8.3%
0.6	20.0	1.00	0.60	17.68	0.858	4.52	6.79	50%	6.67	48%	4.31	-4.7%
0.6	20.0	1.00	0.70	17.68	0.858	3.16	5.36	70%	5.32	68%	3.55	12.5%
0.6	20.0	1.00	0.80	17.68	0.858	1.62	3.92	142%	3.92	142%	3.07	89.3%
0.6	25.0	0.20	0.10	2.91	0.821	1.91	2.30	20%	2.42	27%	2.23	16.7%
0.6	25.0	0.20	0.20	2.91	0.821	1.73	2.06	19%	2.01	16%	1.71	-1.3%
0.6	25.0	0.20	0.30	2.91	0.821	1.41	1.82	29%	1.74	24%	1.37	-3.0%
0.6	25.0	0.20	0.40	2.91	0.821	1.22	1.59	30%	1.53	25%	1.12	-8.3%
0.6	25.0	0.20	0.50	2.91	0.821	1.06	1.35	28%	1.34	26%	0.93	-12.5%
0.6	25.0	0.20	0.60	2.91	0.821	0.87	1.12	28%	1.15	32%	0.78	-10.0%
0.6	25.0	0.20	0.70	2.91	0.821	0.66	0.88	34%	0.95	44%	0.68	2.8%
0.6	25.0	0.20	0.80	2.91	0.821	0.39	0.65	66%	0.75	92%	0.61	57.2%
0.6	25.0	0.40	0.10	7.00	0.847	5.20	5.52	6%	6.13	18%	5.63	8.3%
0.6	25.0	0.40	0.20	7.00	0.847	4.52	4.96	10%	4.98	10%	4.20	-7.1%
0.6	25.0	0.40	0.30	7.00	0.847	3.80	4.39	16%	4.25	12%	3.29	-13.5%
0.6	25.0	0.40	0.40	7.00	0.847	3.02	3.82	27%	3.67	22%	2.63	-13.1%
0.6	25.0	0.40	0.50	7.00	0.847	2.50	3.26	30%	3.15	26%	2.12	-15.1%
0.6	25.0	0.40	0.60	7.00	0.847	2.03	2.69	32%	2.65	31%	1.74	-14.3%
0.6	25.0	0.40	0.70	7.00	0.847	1.48	2.12	43%	2.15	45%	1.46	-1.3%
0.6	25.0	0.40	0.80	7.00	0.847	0.86	1.55	81%	1.62	88%	1.28	49.3%
0.6	25.0	0.60	0.10	11.67	0.853	8.60	9.21	7%	10.61	23%	9.74	13.3%
0.6	25.0	0.60	0.20	11.67	0.853	7.30	8.26	13%	8.51	17%	7.16	-1.9%
0.6	25.0	0.60	0.30	11.67	0.853	6.03	7.32	21%	7.20	19%	5.56	-7.8%
0.6	25.0	0.60	0.40	11.67	0.853	4.79	6.37	33%	6.18	29%	4.40	-8.1%
0.6	25.0	0.60	0.50	11.67	0.853	3.96	5.43	37%	5.27	33%	3.53	-10.9%
0.6	25.0	0.60	0.60	11.67	0.853	3.13	4.48	43%	4.41	41%	2.86	-8.5%
0.6	25.0	0.60	0.70	11.67	0.853	2.26	3.54	56%	3.54	57%	2.38	5.4%
0.6	25.0	0.60	0.80	11.67	0.853	1.27	2.59	104%	2.64	108%	2.07	63.3%
0.6	25.0	0.80	0.10	16.48	0.859	11.98	13.00	9%	15.20	27%	13.95	16.5%
0.6	25.0	0.80	0.20	16.48	0.859	10.03	11.67	16%	12.13	21%	10.20	1.7%
0.6	25.0	0.80	0.30	16.48	0.859	8.27	10.33	25%	10.22	24%	7.87	-4.8%
0.6	25.0	0.80	0.40	16.48	0.859	6.53	9.00	38%	8.73	34%	6.20	-5.0%
0.6	25.0	0.80	0.50	16.48	0.859	5.33	7.66	44%	7.43	39%	4.94	-7.4%
0.6	25.0	0.80	0.60	16.48	0.859	4.16	6.33	52%	6.18	49%	3.98	-4.4%
0.6	25.0	0.80	0.70	16.48	0.859	2.94	4.99	70%	4.92	68%	3.28	11.5%
0.6	25.0	0.80	0.80	16.48	0.859	1.55	3.66	136%	3.63	134%	2.83	82.6%
0.6	25.0	1.00	0.10	21.33	0.864	15.43	16.83	9%	19.79	28%	18.16	17.7%
0.6	25.0	1.00	0.20	21.33	0.864	12.74	15.10	19%	15.75	24%	13.23	3.9%
0.6	25.0	1.00	0.30	21.33	0.864	10.49	13.37	27%	13.24	26%	10.18	-2.9%
0.6	25.0	1.00	0.40	21.33	0.864	8.23	11.65	42%	11.29	37%	7.99	-2.9%

β	γ	τ	a/T	SCF	DoB	FEM Y_{1a}	Ho's Y_{1a}	Ho's Diff	BSI's Y_{1a}	BSI's Diff	Mod Y_{1a}	Mod's Diff
0.6	25.0	1.00	0.50	21.33	0.864	6.66	9.92	49%	9.58	44%	6.33	-4.9%
0.6	25.0	1.00	0.60	21.33	0.864	5.12	8.19	60%	7.94	55%	5.07	-1.0%
0.6	25.0	1.00	0.70	21.33	0.864	3.55	6.46	82%	6.29	77%	4.15	16.9%
0.6	25.0	1.00	0.80	21.33	0.864	1.79	4.74	165%	4.60	157%	3.56	98.7%
0.6	30.0	0.20	0.10	3.23	0.825	2.17	2.55	17%	2.68	24%	2.47	13.9%
0.6	30.0	0.20	0.20	3.23	0.825	1.88	2.29	22%	2.23	19%	1.89	0.5%
0.6	30.0	0.20	0.30	3.23	0.825	1.59	2.03	27%	1.93	21%	1.51	-5.0%
0.6	30.0	0.20	0.40	3.23	0.825	1.27	1.76	39%	1.69	33%	1.23	-3.0%
0.6	30.0	0.20	0.50	3.23	0.825	1.09	1.50	38%	1.47	35%	1.02	-6.5%
0.6	30.0	0.20	0.60	3.23	0.825	0.90	1.24	38%	1.26	40%	0.86	-4.8%
0.6	30.0	0.20	0.70	3.23	0.825	0.68	0.98	44%	1.04	54%	0.74	8.8%
0.6	30.0	0.20	0.80	3.23	0.825	0.39	0.72	84%	0.82	109%	0.67	70.8%
0.6	30.0	0.40	0.10	7.96	0.849	5.94	6.28	6%	6.97	17%	6.40	7.7%
0.6	30.0	0.40	0.20	7.96	0.849	4.99	5.64	13%	5.66	13%	4.77	-4.5%
0.6	30.0	0.40	0.30	7.96	0.849	4.12	4.99	21%	4.82	17%	3.73	-9.5%
0.6	30.0	0.40	0.40	7.96	0.849	3.18	4.35	37%	4.16	31%	2.97	-6.5%
0.6	30.0	0.40	0.50	7.96	0.849	2.63	3.70	41%	3.57	36%	2.40	-8.7%
0.6	30.0	0.40	0.60	7.96	0.849	2.10	3.06	46%	3.00	43%	1.96	-6.6%
0.6	30.0	0.40	0.70	7.96	0.849	1.51	2.41	60%	2.42	61%	1.64	8.9%
0.6	30.0	0.40	0.80	7.96	0.849	0.85	1.77	108%	1.82	114%	1.44	69.7%
0.6	30.0	0.60	0.10	13.31	0.855	9.81	10.50	7%	12.10	23%	11.10	13.2%
0.6	30.0	0.60	0.20	13.31	0.855	8.12	9.42	16%	9.70	20%	8.16	0.5%
0.6	30.0	0.60	0.30	13.31	0.855	6.60	8.35	26%	8.20	24%	6.32	-4.2%
0.6	30.0	0.60	0.40	13.31	0.855	5.09	7.27	43%	7.03	38%	5.00	-1.8%
0.6	30.0	0.60	0.50	13.31	0.855	4.21	6.19	47%	6.00	43%	4.00	-5.0%
0.6	30.0	0.60	0.60	13.31	0.855	3.30	5.11	55%	5.01	52%	3.24	-1.8%
0.6	30.0	0.60	0.70	13.31	0.855	2.34	4.03	72%	4.01	71%	2.69	14.9%
0.6	30.0	0.60	0.80	13.31	0.855	1.28	2.95	131%	2.98	133%	2.34	82.4%
0.6	30.0	0.80	0.10	18.84	0.862	13.60	14.86	9%	17.37	28%	15.93	17.1%
0.6	30.0	0.80	0.20	18.84	0.862	11.23	13.34	19%	13.85	23%	11.63	3.6%
0.6	30.0	0.80	0.30	18.84	0.862	9.10	11.81	30%	11.65	28%	8.96	-1.5%
0.6	30.0	0.80	0.40	18.84	0.862	7.00	10.29	47%	9.95	42%	7.05	0.6%
0.6	30.0	0.80	0.50	18.84	0.862	5.72	8.76	53%	8.45	48%	5.59	-2.2%
0.6	30.0	0.80	0.60	18.84	0.862	4.43	7.23	63%	7.02	59%	4.49	1.4%
0.6	30.0	0.80	0.70	18.84	0.862	3.08	5.71	85%	5.58	81%	3.69	19.7%
0.6	30.0	0.80	0.80	18.84	0.862	1.59	4.18	163%	4.09	157%	3.17	99.5%
0.6	30.0	1.00	0.10	24.45	0.867	17.68	19.29	9%	22.66	28%	20.79	17.6%
0.6	30.0	1.00	0.20	24.45	0.867	14.33	17.31	21%	18.02	26%	15.13	5.6%
0.6	30.0	1.00	0.30	24.45	0.867	11.59	15.33	32%	15.14	31%	11.62	0.3%
0.6	30.0	1.00	0.40	24.45	0.867	8.91	13.35	50%	12.90	45%	9.10	2.2%
0.6	30.0	1.00	0.50	24.45	0.867	7.19	11.37	58%	10.93	52%	7.19	0.1%
0.6	30.0	1.00	0.60	24.45	0.867	5.49	9.39	71%	9.04	65%	5.74	4.6%

β	γ	τ	a/T	SCF	DoB	FEM Y_{1a}	Ho's Y_{1a}	Ho's Diff	BSI's Y_{1a}	BSI's Diff	Mod Y_{1a}	Mod's Diff
0.6	30.0	1.00	0.70	24.45	0.867	3.76	7.41	97%	7.15	90%	4.68	24.5%
0.6	30.0	1.00	0.80	24.45	0.867	1.85	5.43	193%	5.19	181%	3.99	115.9%
0.6	35.0	0.20	0.10	3.50	0.826	1.92	2.76	44%	2.91	52%	2.68	39.4%
0.6	35.0	0.20	0.20	3.50	0.826	1.97	2.48	26%	2.41	23%	2.05	3.9%
0.6	35.0	0.20	0.30	3.50	0.826	1.72	2.19	28%	2.09	22%	1.63	-4.9%
0.6	35.0	0.20	0.40	3.50	0.826	1.47	1.91	30%	1.83	25%	1.33	-9.3%
0.6	35.0	0.20	0.50	3.50	0.826	1.20	1.63	36%	1.60	33%	1.10	-8.2%
0.6	35.0	0.20	0.60	3.50	0.826	0.91	1.34	48%	1.37	50%	0.93	1.7%
0.6	35.0	0.20	0.70	3.50	0.826	0.64	1.06	66%	1.13	76%	0.80	24.7%
0.6	35.0	0.20	0.80	3.50	0.826	0.30	0.78	159%	0.88	193%	0.72	139.4%
0.6	35.0	0.40	0.10	8.75	0.850	5.35	6.90	29%	7.66	43%	7.03	31.4%
0.6	35.0	0.40	0.20	8.75	0.850	5.27	6.20	18%	6.22	18%	5.23	-0.7%
0.6	35.0	0.40	0.30	8.75	0.850	4.45	5.49	23%	5.30	19%	4.09	-8.0%
0.6	35.0	0.40	0.40	8.75	0.850	3.63	4.78	32%	4.57	26%	3.26	-10.1%
0.6	35.0	0.40	0.50	8.75	0.850	2.85	4.07	43%	3.92	38%	2.63	-7.7%
0.6	35.0	0.40	0.60	8.75	0.850	2.16	3.36	56%	3.30	53%	2.15	-0.5%
0.6	35.0	0.40	0.70	8.75	0.850	1.39	2.65	91%	2.66	91%	1.80	29.4%
0.6	35.0	0.40	0.80	8.75	0.850	0.61	1.94	218%	1.99	227%	1.58	158.3%
0.6	35.0	0.60	0.10	14.71	0.856	8.84	11.61	31%	13.37	51%	12.26	38.7%
0.6	35.0	0.60	0.20	14.71	0.856	8.51	10.41	22%	10.72	26%	9.01	5.8%
0.6	35.0	0.60	0.30	14.71	0.856	7.15	9.22	29%	9.05	27%	6.98	-2.4%
0.6	35.0	0.60	0.40	14.71	0.856	5.85	8.03	37%	7.76	33%	5.52	-5.7%
0.6	35.0	0.60	0.50	14.71	0.856	4.58	6.84	49%	6.62	45%	4.41	-3.8%
0.6	35.0	0.60	0.60	14.71	0.856	3.49	5.65	62%	5.52	58%	3.57	2.2%
0.6	35.0	0.60	0.70	14.71	0.856	2.34	4.46	90%	4.42	89%	2.96	26.3%
0.6	35.0	0.60	0.80	14.71	0.856	1.02	3.27	220%	3.28	221%	2.56	151.4%
0.6	35.0	0.80	0.10	20.86	0.863	12.40	16.46	33%	19.22	55%	17.63	42.2%
0.6	35.0	0.80	0.20	20.86	0.863	11.92	14.77	24%	15.32	29%	12.87	7.9%
0.6	35.0	0.80	0.30	20.86	0.863	10.00	13.08	31%	12.89	29%	9.91	-0.9%
0.6	35.0	0.80	0.40	20.86	0.863	8.21	11.39	39%	11.00	34%	7.78	-5.2%
0.6	35.0	0.80	0.50	20.86	0.863	6.44	9.70	51%	9.35	45%	6.18	-4.1%
0.6	35.0	0.80	0.60	20.86	0.863	4.87	8.01	64%	7.76	59%	4.95	1.7%
0.6	35.0	0.80	0.70	20.86	0.863	3.19	6.32	98%	6.16	93%	4.06	27.3%
0.6	35.0	0.80	0.80	20.86	0.863	1.25	4.63	270%	4.51	261%	3.49	179.1%
0.6	35.0	1.00	0.10	27.11	0.869	15.98	21.39	34%	25.11	57%	23.02	44.1%
0.6	35.0	1.00	0.20	27.11	0.869	15.42	19.19	24%	19.96	30%	16.75	8.6%
0.6	35.0	1.00	0.30	27.11	0.869	12.97	17.00	31%	16.75	29%	12.85	-0.9%
0.6	35.0	1.00	0.40	27.11	0.869	10.61	14.80	40%	14.27	35%	10.05	-5.3%
0.6	35.0	1.00	0.50	27.11	0.869	8.23	12.61	53%	12.08	47%	7.93	-3.7%
0.6	35.0	1.00	0.60	27.11	0.869	6.13	10.41	70%	9.98	63%	6.31	3.0%
0.6	35.0	1.00	0.70	27.11	0.869	3.93	8.21	109%	7.87	100%	5.13	30.6%
0.6	35.0	1.00	0.80	27.11	0.869	1.41	6.02	327%	5.70	304%	4.37	209.8%

β	γ	τ	a/T	SCF	DoB	FEM Y_{1a}	Ho's Y_{1a}	Ho's Diff	BSI's Y_{1a}	BSI's Diff	Mod Y_{1a}	Mod's Diff
0.8	10.0	0.30	0.10	2.07	0.727	1.36	1.63	20%	1.81	33%	1.69	24.3%
0.8	10.0	0.30	0.20	2.07	0.727	1.26	1.47	16%	1.53	21%	1.33	5.5%
0.8	10.0	0.30	0.30	2.07	0.727	1.12	1.30	16%	1.35	20%	1.10	-1.4%
0.8	10.0	0.30	0.40	2.07	0.727	1.01	1.13	12%	1.21	20%	0.95	-6.3%
0.8	10.0	0.30	0.50	2.07	0.727	0.91	0.96	6%	1.09	20%	0.83	-8.8%
0.8	10.0	0.30	0.60	2.07	0.727	0.84	0.79	-5%	0.98	16%	0.75	-11.3%
0.8	10.0	0.30	0.70	2.07	0.727	0.71	0.63	-12%	0.86	21%	0.69	-3.3%
0.8	10.0	0.30	0.80	2.07	0.727	0.57	0.46	-19%	0.74	29%	0.65	14.5%
0.8	10.0	0.65	0.10	4.71	0.747	3.34	3.72	11%	4.44	33%	4.13	23.6%
0.8	10.0	0.65	0.20	4.71	0.747	2.91	3.33	15%	3.63	25%	3.15	8.4%
0.8	10.0	0.65	0.30	4.71	0.747	2.54	2.95	16%	3.15	24%	2.57	1.0%
0.8	10.0	0.65	0.40	4.71	0.747	2.24	2.57	15%	2.79	24%	2.16	-3.7%
0.8	10.0	0.65	0.50	4.71	0.747	1.98	2.19	11%	2.48	25%	1.86	-6.1%
0.8	10.0	0.65	0.60	4.71	0.747	1.74	1.81	4%	2.19	26%	1.64	-5.7%
0.8	10.0	0.65	0.70	4.71	0.747	1.47	1.43	-3%	1.90	29%	1.49	1.2%
0.8	10.0	0.65	0.80	4.71	0.747	1.18	1.05	-11%	1.59	35%	1.39	18.1%
0.8	10.0	1.00	0.10	7.41	0.761	5.39	5.85	8%	7.12	32%	6.62	22.9%
0.8	10.0	1.00	0.20	7.41	0.761	4.56	5.25	15%	5.78	27%	5.01	9.9%
0.8	10.0	1.00	0.30	7.41	0.761	3.92	4.65	19%	4.98	27%	4.05	3.2%
0.8	10.0	1.00	0.40	7.41	0.761	3.40	4.05	19%	4.38	29%	3.37	-0.8%
0.8	10.0	1.00	0.50	7.41	0.761	2.97	3.45	16%	3.87	30%	2.88	-3.1%
0.8	10.0	1.00	0.60	7.41	0.761	2.56	2.85	11%	3.39	33%	2.51	-1.8%
0.8	10.0	1.00	0.70	7.41	0.761	2.14	2.25	5%	2.91	36%	2.25	5.3%
0.8	10.0	1.00	0.80	7.41	0.761	1.67	1.65	-1%	2.41	44%	2.09	25.3%
0.8	15.0	0.30	0.10	2.51	0.770	1.73	1.98	14%	2.18	26%	2.02	16.8%
0.8	15.0	0.30	0.20	2.51	0.770	1.64	1.78	8%	1.82	11%	1.56	-4.6%
0.8	15.0	0.30	0.30	2.51	0.770	1.47	1.57	7%	1.59	8%	1.28	-13.2%
0.8	15.0	0.30	0.40	2.51	0.770	1.22	1.37	12%	1.41	15%	1.07	-12.3%
0.8	15.0	0.30	0.50	2.51	0.770	1.07	1.17	9%	1.25	17%	0.92	-14.4%
0.8	15.0	0.30	0.60	2.51	0.770	0.91	0.96	6%	1.10	21%	0.80	-11.9%
0.8	15.0	0.30	0.70	2.51	0.770	0.73	0.76	4%	0.94	29%	0.72	-1.2%
0.8	15.0	0.30	0.80	2.51	0.770	0.52	0.56	7%	0.78	50%	0.67	29.2%
0.8	15.0	0.65	0.10	6.33	0.800	4.87	4.99	3%	5.88	21%	5.44	11.6%
0.8	15.0	0.65	0.20	6.33	0.800	4.38	4.48	2%	4.76	9%	4.07	-7.0%
0.8	15.0	0.65	0.30	6.33	0.800	3.76	3.97	6%	4.08	8%	3.24	-13.9%
0.8	15.0	0.65	0.40	6.33	0.800	3.09	3.46	12%	3.55	15%	2.65	-14.3%
0.8	15.0	0.65	0.50	6.33	0.800	2.64	2.94	11%	3.10	17%	2.21	-16.3%
0.8	15.0	0.65	0.60	6.33	0.800	2.18	2.43	12%	2.67	22%	1.88	-13.7%
0.8	15.0	0.65	0.70	6.33	0.800	1.69	1.92	13%	2.24	32%	1.65	-2.6%
0.8	15.0	0.65	0.80	6.33	0.800	1.10	1.41	28%	1.79	62%	1.50	36.3%
0.8	15.0	1.00	0.10	10.16	0.811	8.26	8.02	-3%	9.60	16%	8.87	7.4%
0.8	15.0	1.00	0.20	10.16	0.811	7.20	7.19	0%	7.72	7%	6.60	-8.4%

β	γ	τ	a/T	SCF	DoB	FEM Y_{1a}	Ho's Y_{1a}	Ho's Diff	BSI's Y_{1a}	BSI's Diff	Mod Y_{1a}	Mod's Diff
0.8	15.0	1.00	0.30	10.16	0.811	6.10	6.37	4%	6.57	8%	5.21	-14.6%
0.8	15.0	1.00	0.40	10.16	0.811	4.94	5.55	12%	5.70	15%	4.23	-14.4%
0.8	15.0	1.00	0.50	10.16	0.811	4.15	4.72	14%	4.95	19%	3.50	-15.8%
0.8	15.0	1.00	0.60	10.16	0.811	3.36	3.90	16%	4.23	26%	2.95	-12.3%
0.8	15.0	1.00	0.70	10.16	0.811	2.53	3.08	22%	3.51	39%	2.55	0.8%
0.8	15.0	1.00	0.80	10.16	0.811	1.57	2.26	44%	2.76	76%	2.30	46.4%
0.8	20.0	0.30	0.10	3.06	0.792	1.97	2.41	23%	2.65	34%	2.45	24.1%
0.8	20.0	0.30	0.20	3.06	0.792	1.82	2.17	19%	2.19	21%	1.88	3.1%
0.8	20.0	0.30	0.30	3.06	0.792	1.60	1.92	20%	1.90	19%	1.52	-5.2%
0.8	20.0	0.30	0.40	3.06	0.792	1.39	1.67	20%	1.68	21%	1.26	-9.6%
0.8	20.0	0.30	0.50	3.06	0.792	1.06	1.42	34%	1.48	40%	1.06	0.1%
0.8	20.0	0.30	0.60	3.06	0.792	0.88	1.18	34%	1.29	46%	0.91	3.9%
0.8	20.0	0.30	0.70	3.06	0.792	0.66	0.93	40%	1.09	65%	0.81	22.7%
0.8	20.0	0.30	0.80	3.06	0.792	0.41	0.68	66%	0.88	115%	0.75	81.7%
0.8	20.0	0.65	0.10	8.04	0.825	6.19	6.34	2%	7.42	20%	6.84	10.5%
0.8	20.0	0.65	0.20	8.04	0.825	5.55	5.69	3%	5.98	8%	5.08	-8.6%
0.8	20.0	0.65	0.30	8.04	0.825	4.77	5.04	6%	5.09	7%	3.99	-16.4%
0.8	20.0	0.65	0.40	8.04	0.825	4.03	4.39	9%	4.40	9%	3.21	-20.3%
0.8	20.0	0.65	0.50	8.04	0.825	3.11	3.74	20%	3.80	22%	2.63	-15.4%
0.8	20.0	0.65	0.60	8.04	0.825	2.45	3.09	26%	3.23	32%	2.19	-10.4%
0.8	20.0	0.65	0.70	8.04	0.825	1.76	2.44	38%	2.65	51%	1.88	6.8%
0.8	20.0	0.65	0.80	8.04	0.825	0.98	1.78	82%	2.06	110%	1.68	71.5%
0.8	20.0	1.00	0.10	13.55	0.834	11.02	10.69	-3%	12.70	15%	11.70	6.2%
0.8	20.0	1.00	0.20	13.55	0.834	9.50	9.59	1%	10.17	7%	8.63	-9.2%
0.8	20.0	1.00	0.30	13.55	0.834	8.03	8.50	6%	8.61	7%	6.74	-16.1%
0.8	20.0	1.00	0.40	13.55	0.834	6.23	7.40	19%	7.42	19%	5.40	-13.4%
0.8	20.0	1.00	0.50	13.55	0.834	5.10	6.30	24%	6.37	25%	4.38	-14.0%
0.8	20.0	1.00	0.60	13.55	0.834	3.94	5.20	32%	5.38	37%	3.62	-8.1%
0.8	20.0	1.00	0.70	13.55	0.834	2.75	4.11	49%	4.38	59%	3.07	11.6%
0.8	20.0	1.00	0.80	13.55	0.834	1.45	3.01	107%	3.35	131%	2.72	87.3%

VITA

Chung Ming Ho

Candidate for the Degree of

Doctor of Philosophy

Thesis: ASSESSMENT OF SIMPLIFIED METHODS FOR EVALUATION OF STRESS INTENSITY FACTORS IN TUBULAR JOINTS

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