

STEPS	DETAILS	BACKGROUND
Prepare the data files to be processed	1. Locate your raw EM27 data files. 2. If not already done, organize files by day and instrument. Main folders should correspond to the instrument serial numbers in SN#### format (e.g., SN155). Nested folders should correspond to the deployment date in YYMMDD format (e.g., 221019 for a deployment on October 19, 2022). 3. Ensure that all raw EM27 data files are named according to the following file naming convention: YYMMDDSN.#### 4. Locate your surface pressure data. The location as well as file name, structure, and type can be customized to your liking, but should be repeatable between files. Make note of the path to your data. 5. If not already done, collect the a priori profile (*.map) data files. It is recommended that you use the sub-daily files created using TCCON data, which can be made on request for any site and date range. 6. Make note of the path to your *.map files.	The location of the files does not matter so long as the code in your <i>proffastpylot</i> directory is able to access the file location without the need for extra permissions (i.e., do not store raw EM27 data on a remote cluster and try to run the PROFFAST code locally). The four digits making up the file extension are assigned by the OPUS software for the EM27. See the TCCON wiki for more information on gathering *.map files: https://tcon-wiki.caltech.edu/Main/WebHome

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Set up the retrieval directory in <i>proffastpylot</i>	7. Inside your <i>proffastpylot</i> directory, create a folder with a descriptive name for the data set you want to process. This will be your retrieval directory.	Use campaign or deployment site names as sub-directory names to help organize data
Set up the retrieval directory in <i>proffastpylot</i> (continued)	8. Inside your retrieval directory, create two folders: <i>analysis</i> and <i>results</i> 9. Navigate to <i>proffastpylot/example</i> 10. Copy <i>input_sodankyla_example.yml</i> into your retrieval directory. 11. Still inside the example folder, copy <i>log_type_pressure.yml</i> into your retrieval directory. 12. Still inside the example folder, copy <i>run.py</i> into your retrieval directory. 13. Inside your retrieval directory, rename <i>input_sodankyla_example.yml</i> to match your directory name. 14. Open your renamed input file and edit the following lines: a. <u>Line 13</u> : your EM27's serial number, preceded by SN b. <u>Line 15</u> : your site name without spaces c. <u>Line 19</u> : a two letter/number code unique to your deployment site d. EITHER <u>lines 25-27</u> : the deployment site latitude (degrees), longitude (degrees; East is positive), and altitude (kilometers) OR <u>line 37</u> : path to file with coordinate data starting from your retrieval directory. IF entering latitude, longitude,	This folder comes with the code when you download it and contains test data and other necessary files to run the retrieval algorithm. E.g., <i>input_campaignName.yml</i>

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Set up the retrieval directory in <i>proffastpylot</i> (continued)	and altitude in the input file, make sure no path is listed on <u>line 37</u>. e. <u>Line 41</u>: offset in hours from UTC. f. <u>Line 62</u> (optional): the smallest file size you wish to process in megabytes g. <u>Lines 78-79</u> (optional): date range you wish to process. Not necessary if wanting to process all dates h. <u>Line 125</u>: full path to EM27 data location i. <u>Line 126</u>: full path to location of *.map files j. <u>Line 127</u>: full path to pressure data location 15. Save and close your renamed input file. 16. Open <i>log_type_pressure.yml</i> and edit the following lines: a. Lines 6-8: filename parameters for identifying your pressure data files. Each line is defined in the comments of the *.yml file. b. Lines 16-24: file structure parameters for parsing the data inside your pressure data files. Each line is defined in the comments of the *.yml file. c. Line 38: offset in hours from UTC. Used for converting the times in your pressure file to UTC. 17. Save and close your pressure *.yml file.	Example: use -6.0 if you collected data in Central Standard Time. 1.0 was used for processing TRACER data. Note that data collected at different sites should be processed in a separate retrieval run. The separator (<i>sep</i>, line 24) specified in the example file (“\t”) indicates that the pressure file is tab delimited. This offset may be different than the one used in step 15 depending on what time zone the pressure sensor was set up to collect data in

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Set up the retrieval directory in <i>proffastpylot</i> (continued)	18. Open <i>run.py</i> and edit the following lines: a. <u>Line 24</u>: the name of your renamed input file b. <u>Lines 10, 18-21</u>: delete the contents. These lines are only meant to be used with the example data provided with the code. 19. Save and close <i>run.py</i>.	
Run the retrieval	20. Navigate back to the <i>proffastpylot</i> folder. 21. Activate the Python virtual environment using the following command: <code>source prf_venv/bin/activate</code> 22. Navigate to your retrieval directory. 23. Run the retrieval algorithm using the following command: <code>python run.py</code> 24. After the retrieval has finished running, find your retrieved data in the results sub-directory of your retrieval directory. <i>*invparms*</i> files contain ASCII tables with retrieved trace gas results. <i>*.spc</i> files contain information about the different spectral fits generated by the retrieval algorithm.	