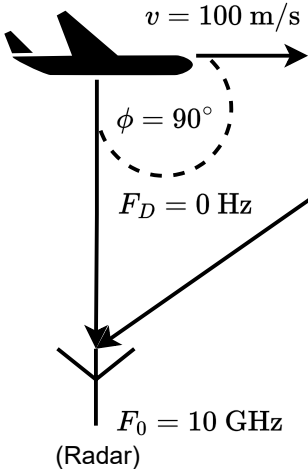




A diagram illustrating a radar system. A black silhouette of an aircraft is shown at the top right, moving to the right with a velocity $v = 100 \text{ m/s}$. A solid line with a downward-pointing arrow represents the radar beam, labeled $F_0 = 10 \text{ GHz}$ and "(Radar)". A dashed arc indicates the angle $\phi = 150^\circ$ between the aircraft's velocity vector and the radar beam.

$$F_D = \frac{2v \cos(\phi) F_0}{c - v \cos(\phi)}$$
$$= \frac{2 \cdot 100 \text{ m/s} \cdot \cos(150^\circ) \cdot 10 \cdot 10^9 \text{ Hz}}{2.998 \cdot 10^8 \text{ m/s} - 100 \text{ m/s} \cdot \cos(150^\circ)}$$
$$= -5.777 \text{ kHz}$$