

47. The detector (the second plane) is moving toward the source (the first plane). This tends to increase the frequency, so we use the plus sign in the numerator of Eq. 18-47. The source is moving away from the detector. This tends to decrease the frequency, so we use the plus sign in the denominator of Eq. 18-47. Thus

$$f' = f \frac{v + v_D}{v + v_S} = (16000 \text{ Hz}) \left(\frac{343 \text{ m/s} + 250 \text{ m/s}}{343 \text{ m/s} + 200 \text{ m/s}} \right) = 17500 \text{ Hz} .$$