

54. As a result of the Doppler effect, the frequency of the reflected sound as heard by the bat is

$$f_r = f' \left(\frac{v + u_{\text{bat}}}{v - u_{\text{bat}}} \right) = (39000 \text{ Hz}) \left(\frac{v + v/40}{v - v/40} \right) = 41000 \text{ Hz} .$$