161.

Problem 20.75 (RHK)

A 2000-Hz siren and a civil defence official are both at rest with respect to the Earth. What frequency does the official hear if the wind is blowing at 12 m s^{-1} *(a) from source to observer and (b) from observer to source?*

Solution:

When the wind is blowing at 12 m s^{-1} from source to observer the speed of sound in the medium as the signal travels toward the observer will be $(343+12) \text{ m s}^{-1}$. but as the source and the observer are at rest with respect to each other there will be no change in frequency as measured by the observer either when the wind blows toward the detector or in the opposite direction.