C.5 Doppler effect

Checklist

What you should know

After studying this subtopic, you should be able to:

- Explain the Doppler effect and its effect on the perception of sound waves and electromagnetic waves.
- Use wavefront diagrams to represent the Doppler effect when the source is moving or the observer is moving.
- Determine the relative change in frequency and wavelength for a light wave using the equations:

$$\frac{\Delta f}{f} = \frac{\Delta \lambda}{\lambda} \approx \frac{v}{c}$$

- Explain that shifts in spectral lines from stars and galaxies give information about their motion in space.

Higher level (HL)

- Determine the observed frequency of waves for a moving source or a moving observer using:

$$f' = f\left(\frac{v}{(v \pm u_s)}\right) \text{ and } f' = f\left(\frac{(v \pm u_o)}{v}\right)$$