

Wavelength shift for moving objects.

The wavelength of light emitted by a moving object is shifted. This effect is called the doppler shift.

- If the object is coming toward you, the light is shifted toward shorter wavelengths, *blue shifted*.
- If the object is going away from you, the light is shifted toward longer wavelengths, *red shifted*.
- The amount of shift is bigger if the emitting object is moving faster.

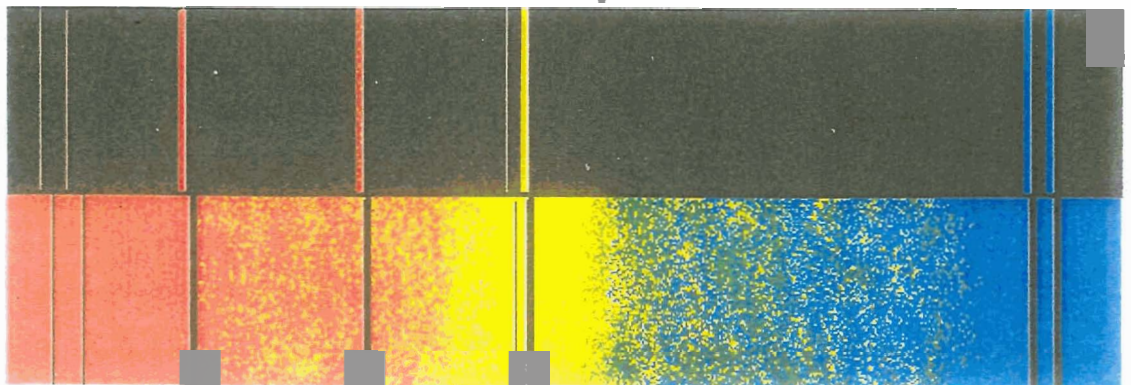
We don't normally notice this for light. But it is easy to observe for sound:

- *Blue shifted* = higher frequency = higher pitch.
- *Red shifted* = lower frequency = lower pitch.

Use of the Doppler shift in astronomy

Here is what the spectrum of a star that is moving toward us might look like (somewhat simplified):

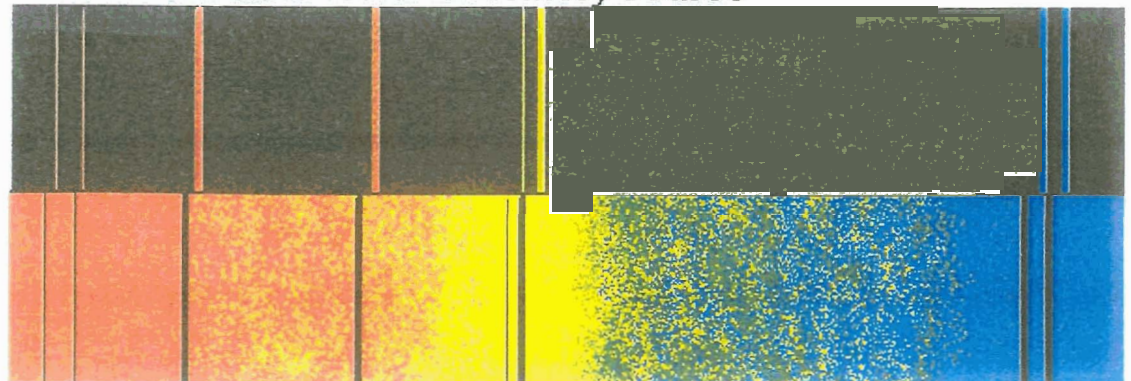
Reference lines from laboratory source



Absorption lines from star

Here is what the spectrum of a star that is moving away from us might look like (somewhat simplified):

Reference lines from laboratory source



Absorption lines from star

- The amount of shift is bigger if the emitting object is moving faster.
- Thus if we know the original wavelength, we can deduce