

S281 TMA04

(a) A Doppler shift is the observed change in wavelength or frequency of a source at an observer's position due to relative motion between source and observer. We can find the velocity of a source relative to us along our line of sight from the equation
$$v = c \left(\frac{f - f'}{f'} \right) = c \left(\frac{\lambda' - \lambda}{\lambda} \right) = \frac{c \Delta \lambda}{\lambda}$$

where f and f' are emitted and observed frequencies/wavelengths respectively, and v is relative motion along line of sight.

To study the rotation of the Galaxy, the orbital velocity and radial distance of the Sun must first be found. The Sun's orbital velocity can be deduced from studies of high velocity stars of the halo, which do not participate in the rotation of the disc, and provide a reference population with respect to which the velocity of the Sun can be measured, or by measurements of velocities of nearby stars to define a local standard of rest, then the velocity of the solar neighborhood around Galactic centre can be found from studies of radial velocities of other gal-

Distance of the Sun from