

Line Asymmetry and Projection Factors in Cepheid Variables

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ABSTRACT. New methods for displaying radial velocities of pulsating stars are presented. The profiles of weak spectral lines in Cepheids are observed to be asymmetric during the inward velocity part of the pulsation cycle but not the outward velocity part. A prescription is given for standardising the method of measuring radial velocity. New projection factors are calculated for Cepheid variables using this method and $p=1.37$ is recommended as a constant value. This should lead to a systematic error in radius determinations of $\sim 1\%$ from this source.

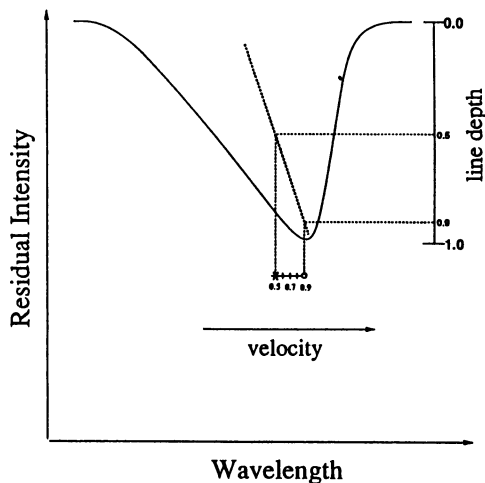


Fig 1. A schematic line profile and bisector showing the velocity as measured at different depths in the line profile. Individual metal line velocities are measured from the position of the bisector at depths 0.7, 0.8 and 0.9 in the line profile. $H\alpha$ velocities are measured at a depth of 0.9.

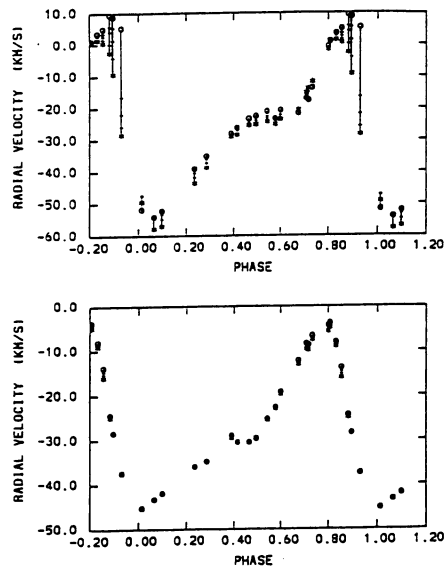


Fig 2. Radial velocity curves for W Sgr displaying the radial velocity at all points on the bisector between heights 0.5 and 0.9. a) $H\alpha$. b) $Fe I \lambda = 6546 \text{ \AA}$. This emphasises the degree of asymmetry in the spectral lines.