

THE ABSOLUTE DIMENSIONS AND MASSES OF IQ PERSEI

Claud H. Lacy

Department of Physics, University of Arkansas

ABSTRACT. High signal-to-noise ratio spectrometric observations of the large light-ratio eclipsing binary IQ Per (B7 + A2) have been obtained with the coude Reticon spectrograph of the 2.7 m reflector at McDonald Observatory. Absorption lines of the secondary are seen at the 4481 Å MgII line and the 4549 Å TiIII + FeII blend. Radial velocities of both components have been measured by cross-correlation techniques and spectroscopic orbits have been computed. The fitted orbits have an eccentricity (0.075 ± 0.007) that is consistent with the photometric orbit of Hall, Gertken and Burke (1970). Young's (1975) "provisional" estimate of K_2 is about 14% too small. Absolute dimensions and masses have been computed from Hall et al.'s (1970) photometric orbit and the new spectroscopic orbit. Additionally, V-R photometric observations obtained by M. Frueh at McDonald Obs. have been analysed by Popper with light curve synthesis techniques (WINK and EBOP). The relative radii of the new photometric orbits differ by less than 2% from the previous orbits, and the other orbital elements also show excellent agreement. The absolute dimensions and masses are ($3.51 \pm 0.04 M_{\odot}$, $2.46 \pm 0.04 R_{\odot}$) for the primary and ($1.73 \pm 0.02 M_{\odot}$, $1.50 \pm 0.03 R_{\odot}$) for the secondary. Both stars are near the zero-age main sequence. The value of ω has changed significantly between the epoch of Hall, Gertken, and Burke's (1970) observations and my own due to apsidal motion. The apsidal motion period is estimated to be in the interval $90 \leq \tau \leq 180$ yr.

REFERENCES

- Hall, D. S., Gertken, R. H. and Burke, E. W. Jr. 1970, Publ. Astron. Soc. Pacific, 82, 1077.
Young, A. 1975, Publ. Astron. Soc. Pacific, 87, 717.