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HR 7578: A POSSIBLE LATE-TYPE ECLIPSING BINARY AND/OR A BY DRACONIS VARIABLE

High dispersion spectroscopic observations obtained at the Erwin W. Fick Observatory, Iowa State University and McDonald Observatory, University of Texas have shown that HR 7578 = HD 188088 is a bright, V=6.16, double-lined K2-3 V binary with a period of 46.8 days and an eccentricity of 0.69. The minimum masses of the components are $0.85 \pm 0.03\ M_{\odot}$ each, suggesting that the inclination of the system may be high enough for eclipses to occur despite the relatively long period and presumed small radii of the stars.

Because there are very few eclipsing binaries of solar type or later, a search for such eclipses is important. Since the declination of this object is -24°, it is best observed from the southern hemisphere. The ephemerides for possible eclipses are

$$2444147.591 + 46.817E$$

for a possible eclipse near apastron and

$$2444158.880 + 46.817E$$

for a possible eclipse near periastron.

Because of the large eccentricity, an eclipse near periastron is more likely to occur and could last up to 10 hours. A total eclipse near apastron would last about 54 hours. Spectroscopic observations obtained near times of possible eclipse minima show little, if any, change in line strengths, implying that the possible eclipses are at best partial. During 1983, the best opportunity to observe a possible eclipse near periastron occurs in mid-May.

Spectroscopic observations indicate that the components have $v \sin i$'s of 5 - 8 km s^{-1} each. Such rotational velocities (Bopp, Noah, and Klimke 1980) suggest that the system may be a BY Draconis variable. Thus, low amplitude, quasi-sinusoidal light variations with a period of 5 - 8 days may be detected. A full discussion of this system will appear in a forthcoming volume of the Astrophysical Journal.

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Reference:

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