

COMMISSION 27 OF THE I. A. U  
INFORMATION BULLETIN ON VARIABLE STARS.  
NUMBER 263

Konkoly Observatory  
Budapest  
1968 March 27

REMARKS CONCERNING HD 209813

In number 253 of this Bulletin, Blanco and Catalano report the discovery that HD 209813 shows a light variability of about 0.1 mag. They estimate that the period is about 25.98 days, and, quoting an HD spectral type of KO, they suggest that the star is a Cepheid.

Evidently overlooked by these authors, however, is the fact that HD 209813 is a well-studied spectroscopic binary (Northcott 1947). The period is 24.431 days, and the amplitude of the velocity curve is 66.3 km/sec. The star has also had a quantitatively-determined spectral type of KO II-III assigned to it by Halliday 1955. Observations on a single night at rather large air mass lead to the following UBV parameters for the star:

$$V = 6.77 \quad B-V = 1.11 \quad U-B = 0.80$$

An examination of stars near the line of sight to HD 209813 indicate that the colour excess of the star is  $E_{B-V} = 0.09$ .

These data prompt the following remarks:

- a. The similarity of the two periods quoted above, and the fact that the period of Blanco and Catalano is only a preliminary one, suggest the probability that there is really only one period of 24.431 days. It would be most interesting to see the light-curves of Blanco and Catalano replotted with this period.
- b. A spectral type of KO II-III is unusual for a pulsating variable, and is definitely incompatible with the spectral types of Cepheids.

- c Blanco and Catalano report that the amplitude of light variation is the same in all three of U, B, and V, which is also unusual among pulsating variables.
- d If the velocity variation of 66 km/sec is taken as due to pulsation, then that amplitude is quite incompatible with the light amplitude of only 0.1 mag., as is the sinusoidal shape of the velocity curve with the period.
- e The colours of the star, especially U-B, are too blue for the spectral type.
- f A preliminary investigation reveals that the hydrogen lines in HD 209813 are too strong for the spectral type. Also, the H and K lines show emission cores.

These considerations lead us to suggest that HD 209813 is probably not a pulsating variable, but is an eclipsing system composed of a K-giant and an F-subgiant. If this is so, then the system is one of considerable importance, since its space velocity is about 80 km/sec. It may, therefore, be the only high velocity star known for which both radii and masses are obtainable, and we urge that the discovery of Blanco and Catalano be followed up by further detailed photometry.

David Dunlap Observatory  
Richmond Hill, Ontario, Canada.  
March 19, 1968.

J.D. FERNIE  
JOAN O. HUBE  
JOHN L. SCHMITT

References:

- Halliday, I., Ap. J. 122, 222, 1955.  
Northcott, R. J., Pub. David Dunlap Obs. 1, 369, 1947.