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

Number 2216

Konkoly Observatory
Budapest
1982 October 21

HU ISSN 0374-0676

HD 190540: A NEW VARIABLE STAR

Because Bidelman and MacConnell (1973) reported Ca II H and K emission, we suspected HD 190540 might be an RS CVn binary and therefore might show the photometric wave characteristic of most stars of that type. According to their table VII, $m_v = 8^m.4$ and the spectral type is K0 IV + F.

Henry, observing with the No. 4 16-inch Cassegrain at Kitt Peak, obtained data on 3 nights between JD 2444716.9 and 2444719.9. Henry and Sherlin, observing with the 48-inch Newtonian at Cloudcroft, obtained data on 17 nights between JD 2444872.7 and 2445153.9. All observations were made in V, with BD - 18°5593 as the comparison star. The individual differential magnitudes, corrected for differential extinction and transformed differentially to V of the UBV system, have been sent to the I.A.U. Commission 27 Archive for Unpublished Observations of Variable Stars (Breger 1979), where they are available as file no. 106.

The figure below is a plot of nightly means of the Cloudcroft data,

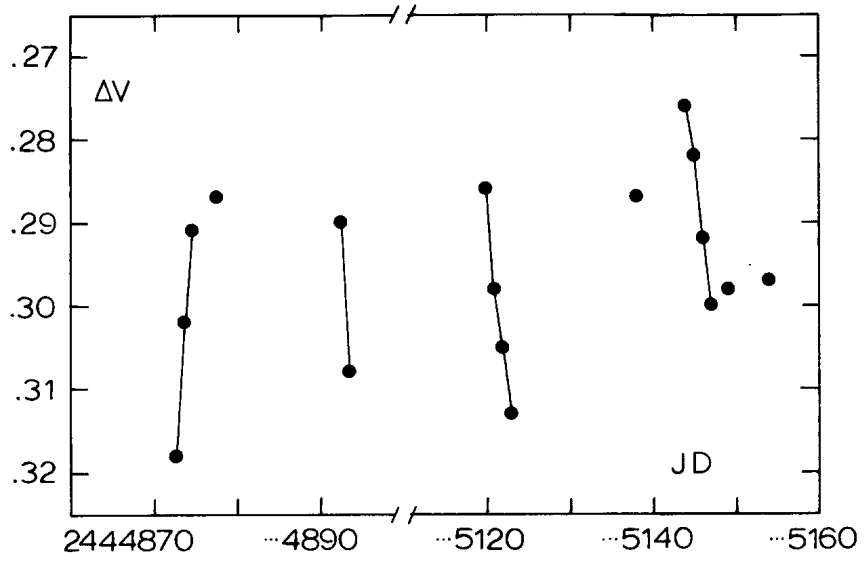

Figure 1

where ΔV is in the sense variable minus comparison. Points taken on consecutive nights are joined with straight line segments. It was immediately obvious that HD 190540 was variable, with an amplitude of $\Delta V = 0^{m}.04$. Further inspection of the data suggested that the period was around 8 days or a bit longer. With a period-finding program based on an approach similar to that of Lafler and Kinman (1965), three periods were found ($8^{d}.10$, $8^{d}.35$, and $8^{d}.60$) which produced light curves of comparable quality. All three were somewhat unsatisfactory, however, in at least one respect. Either the light curve is variable with time or else we somehow have failed to find the correct period.

Additional photometry should be obtained to determine more accurately what the photometric period really is. We have been in communication with Luis Balona and T. Lloyd Evans of the South African Astronomical Observatory, who tell us they have been obtaining spectroscopic and photometric observations of this star (and all of the stars in table VII of Bidelman and MacConnell). If radial velocity measures indicate HD 190540 is a binary system with an orbital period around 8 days, then it would be a regular RS CVn binary by the definition of Hall (1976).

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References:

Bidelman, W. P. and MacConnell, D. J. 1973, A. J. 78, 687.

Breger, M. 1979, I.B.V.S. No. 1659.

Hall, D. S. 1976, I.A.U. Colloq. No. 29, 287.

Lafler, J. and Kinman, T. D. 1965, Ap. J. Suppl. 11, 216.