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HR 2554 - A POSSIBLE NEW ζ AUR SYSTEM

HR 2554 (HD 50337, G6 II, $V = 4.40$, $B - V = 0.92$) is a 195-day single-lined spectroscopic binary that, no doubt due to its southern declination, has drawn little notice beyond its binary nature. Although usually listed in surveys of bright evolved G stars, it has been relatively neglected both spectroscopically and photometrically in recent times and no detailed studies of it have been published in 60 years. Its orbit was last examined by Lucy and Sweeney (1971) from Lick data taken in 1918. *UBV* photometry is available from Johnson *et al* (1966), and the most recent spectral classification (G6 II) is from the Michigan southern all-sky survey (Houk and Cowley 1975). Although its ($U-B$) is too blue for a star of this type, no evidence of the secondary spectrum has been reported.

From observations with the *International Ultraviolet Explorer*, we have found the secondary to be of type A0 V, visually about 3 mag. fainter than the primary star. Using velocities measured from *LWR* high dispersion observations, we have redetermined the orbit and find that the Lucy and Sweeney elements remain unchanged except for a slight reduction of the orbital period by 0.02^d. If the inclination is 90°, photometric eclipses of the secondary star are expected to occur at

$$J.D. = 2421733.8 + 195.24 E.$$

Using these elements and the expected dimensions of the components, we predicted a 6-day eclipse should occur on 21.0 Oct. 1986, with an uncertainty of about 2 days.

IUE observations from 23.9 - 24.5 Oct. 1986 did show the system in a partial phase, apparently at egress, with the ultraviolet flux only 15% of that out-of-eclipse. Using the counts from the *FES*, we find that the depth was 0.06 mag. in *V*. The spectrum of the secondary was overlaid by many sharp, low-level Fe II absorption components from the outer atmosphere of the primary star. HR 2554 thus appears to be a member of the atmospheric eclipsing ζ -Aur systems, joining 22 Vul (Ake, Kondo and Parsons 1985) as the second G-type system in this group.

Further ground-based observations are needed of this star to better define the light curve, particularly to see if the eclipse is total. Two opportunities will present themselves this year: 4.3 May and 15.5 Nov. 1987. Observations around the May eclipse are needed to support further *IUE* observations. We expect the eclipse depths to increase with decreasing wavelength, with $\Delta B \sim 0.14$ and $\Delta U \sim 0.27$ mag.

HR 2554 and our recommended comparison and check stars may be found on *AAVSO* chart 154, identified by 44, 65, τ , and 54, respectively:

Recommended comparison star: HR 2524 (G6 III, $V = 6.46$, $B - V = 0.86$)
 check stars: τ Pup (K1 III, $V = 2.93$, $B - V = 1.20$)
 or: HR 2523 (K1 II-III +G:p, $V = 5.40$, $B - V = 1.34$)

(HR 2524 and τ Pup have 10^{th} mag companions at $2''$ and $26''$, respectively)

Coordinates for equinox 1987.4, precessed from SAO coordinates, are:

HR 2554	(HD 50337, $-53^\circ 1168$)	6^h	49^m	34.9^s	-53°	$36'$	$27''$
HR 2524	(HD 49705, $-54^\circ 1115$)	6	46	26.4	-54°	40	52
τ Pup	(HD 50310, $-50^\circ 2415$)	6	49	37.3	-50°	35	55
HR 2523	(HD 49689, $-51^\circ 2078$)	6	46	34.6	-51°	15	01

THOMAS B. AKE¹ and SIDNEY B. PARSONS¹
 Computer Sciences Corporation
 Space Telescope Science Institute
 3700 San Martin Drive
 Baltimore, MD 21218 U.S.A.

¹ Guest Observer, *International Ultraviolet Explorer*

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