

COMMISSIONS 27 AND 42 OF THE IAU
INFORMATION BULLETIN ON VARIABLE STARS

Number 4828

Konkoly Observatory
Budapest

15 January 2000

HU ISSN 0374 – 0676

ON VARIABILITY OF R SEXTANTIS

MERCHÁN-BENÍTEZ, P.; JURADO-VARGAS, M.

Departamento de Física, Facultad de Ciencias, Universidad de Extremadura, Avda de Elvas s/n, 06071, Badajoz (Spain), e-mail: pedromer@unex.es, mjv@unex.es

R Sex (GSC 5474.380, HD 84127) was initially noted as a variable star at Harvard 105 years ago with a luminosity variation from 9.7 to 10.6 photographic magnitudes. R Sex is included in the GCVS (Kholopov et al. 1985) as a doubtful semiregular variable star (Lb:) with a spectral type M5IIIe and without a period established. However, the variability of R Sex was questioned and it was considered as “constant?” in the previous versions of GCVS. Due to the apparent stability in the brightness of R Sex, Bidelman (1980) took into account spectroscopic observations to conclude that R Sex does indeed deserve its variable star designation, due to the presence of hydrogen emission and its spectral variability. By using photometric observations, we demonstrate that the luminosity variation of R Sex is real, and the star shows a light curve that could be consistent with its actual classification as Lb, although the classification as an SRd variable star could also be possible.

In order to confirm the variability of R Sex, we made differential photometry in the *V* band of the Kron–Cousins system during 18 nights, from 5 April to 10 June 1999, using a Starlight Xpress CCD camera (based on chip SONY ICX027BL 6.1×4.35 mm², 500×256 pixels) attached to the Newton focus of the 40-cm reflector at Observatorio del Departamento de Física de la Universidad de Extremadura (Badajoz, Spain). The star GSC 5474.214 ($V = 9.5$) was employed as a comparison and GSC 5474.444 ($V = 9.7$) was chosen as a check star. The comparison star had constant brightness during the observations. Table 1 shows the CCD data obtained by us for each night for R Sex and the comparison star. The mean accuracy of these observations was about 0.010 magnitudes.

Figure 1 displays the light curve obtained for R Sex. This light curve shows a rather flat minimum at HJD 2451308.4, and the most notable feature is an almost linear decline in brightness before the aforementioned date. The overall shape of this decline and the rise following it could be reminiscent of SRd behavior. Although the spectral type M5IIIe is not in a perfect agreement with the typical spectral types of SRd stars (roughly G to K), however, this type of variable stars usually shows strong hydrogen emissions, in accordance with the spectroscopic observations for R Sex (Bidelman 1980). More information would be necessary to confirm this point. The essential characteristics of this type of stars can be found in the works of Dawson & Petterson (1982) and Dupuy et al. (1983). Further observations of this star could confirm the possible new classification as an SRd star if their cycles show some regularity or, on the contrary, to conserve its actual classification as an Lb star if its light curve is irregular.

Table 1: Photometric data for R Sex

Mean HJD	ΔV (variable – comparison)	ΔV (comparison – check)
2451274.4	0.627 ± 0.014	-0.218 ± 0.009
2451276.4	0.640 ± 0.010	-0.223 ± 0.008
2451277.3	0.657 ± 0.010	-0.221 ± 0.008
2451279.3	0.656 ± 0.006	-0.220 ± 0.007
2451281.4	0.675 ± 0.007	-0.223 ± 0.004
2451284.4	0.687 ± 0.005	-0.218 ± 0.004
2451286.3	0.693 ± 0.009	-0.222 ± 0.005
2451292.3	0.724 ± 0.019	-0.213 ± 0.016
2451294.4	0.731 ± 0.007	-0.212 ± 0.003
2451308.4	0.764 ± 0.007	-0.206 ± 0.008
2451315.4	0.673 ± 0.002	-0.221 ± 0.020
2451317.4	0.649 ± 0.007	-0.213 ± 0.013
2451320.4	0.601 ± 0.009	-0.220 ± 0.011
2451327.4	0.477 ± 0.012	-0.220 ± 0.013
2451331.4	0.418 ± 0.015	-0.206 ± 0.020
2451333.4	0.394 ± 0.012	-0.222 ± 0.009
2451335.4	0.379 ± 0.009	-0.214 ± 0.006
2451340.4	0.278 ± 0.005	-0.207 ± 0.020

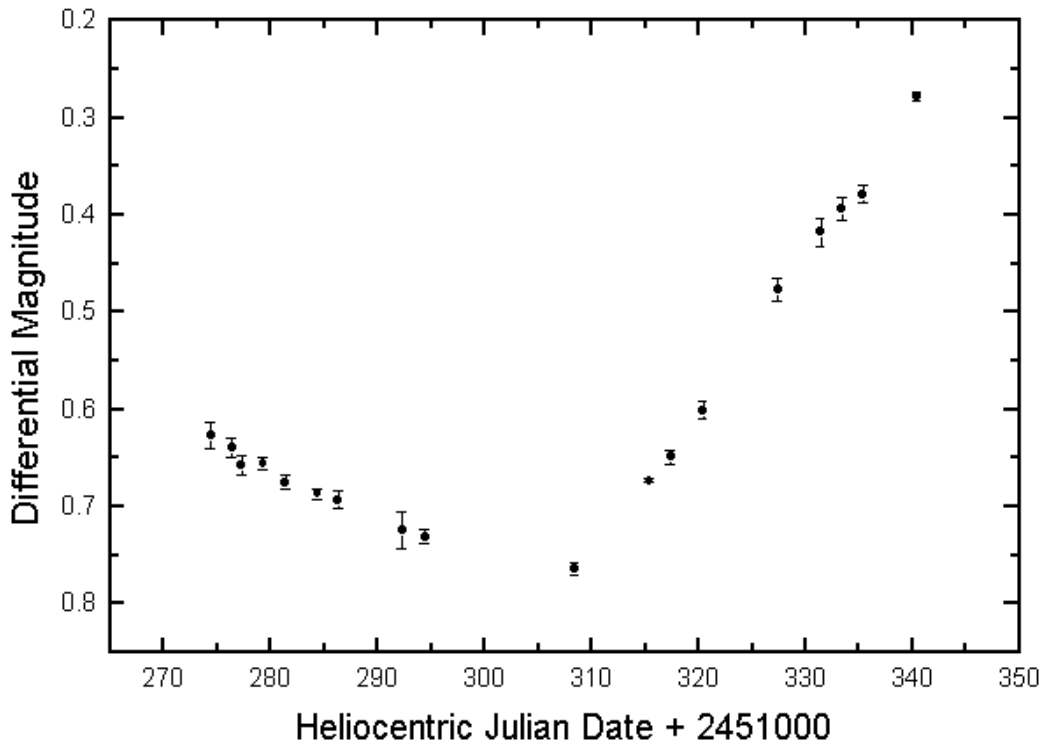


Figure 1. Photometric light curve for R Sex

Acknowledgements: This research was supported by the Consejería de Educación y Juventud (Junta de Extremadura) and Fondo Social Europeo under project IPR98A047/

References:

Bidelman, W. P., 1980, *IBVS*, No. 1858

Dawson, D.W. & Patterson, C.R., 1982, *PASP*, **94**, 574

Dupuy, D.L., Allwright, W.B., Dawson, D.W. & Africano, J.L., 1983, *PASP*, **95**, 427

Kholopov, P.N. et al., 1985, General Catalogue of Variable Stars, Nauka Publishing House, Moscow