SPECTROPHOTOMETRIC PROPERTIES OF Be STARS: THE Be-SHELL STAR 48 LIB

A. Moujtahid[1], L. Cidale[2,3], A.-M. Hubert[1], A. Ringuelet[2,3], and J. Zorec[4]

We investigate the properties of the circumstellar envelope of the Be-shell star 48 Lib throughout the analysis of the spectrophotometric behavior around the Balmer discontinuity over a long time-scale. The data used in the present work were obtained from several photometric systems published in the literature since 1963. Our results confirm that 48 Lib presents the same behavior as other strong Be-shell stars; that is, the star shows no variations either in the flux gradient of the Paschen continuum (ϕ), nor in the visual magnitud (V) as a function of the Balmer discontinuity value (D) at λ3700 Å

Furthermore, by means of a simple model for the circumstellar envelope, we derive the physical parameters of the atmospheric layers where these spectrophotometric variations occur. We find that the shells contributing to the continuum spectrum are located at distances ($r = R_e/R_*$) smaller than 2 stellar radii, the temperature value (T) of these regions varies between 6500 and 8000 K, and the optical depth τ_V takes values between 0.2 and 0.5. We observed that the strongest spectrophotometric variation is related to that of the optical depth τ_V. We also note that τ_V is linearly correlated with V and ϕ. There is also a linear relation between T and D. The parameter r and τ_V do not show any dependence with D.

[1]Observatoire de Paris-Meudon, France

[2]Facultad de Ciencias Astronómicas y Geofísicas, Argentina

[3]CONICET, Argentina

[4]Institut d'Astrophysique de Paris, France

THE ELLIPTIC ORBIT OF THE WR BINARY SYSTEM CV SERPENTIS

Virpi S. Niemela [1,2,3], Nidia I. Morrell [1,4] Rodolfo H. Barbá [1,4,5], and Guillermo L. Bosch [1,5,6]

CV Serpentis (HD 168206), is a massive binary system composed by a Wolf-Rayet star of class WC8 and a late O type star, which apparently has stopped eclipsing (Kuhi & Schweizer 1970, ApJ 160, L185; Stepien 1970, Acta Astr. 20, 13). Through the analysis of further spectroscopic observations obtained at CTIO (Chile) and CASLEO (Argentina), together with data previously considered by Massey & Niemela (ApJ 245, 195, 1981), we have made a new determination of the orbital parameters of this binary.

The period that best fits the radial velocity variations of both the emission and absorption lines is 29.704 days, in acceptable agreement with the value of 29.707 days derived in earlier studies. The radial velocity curve defined by the absorption lines shows a non negligible eccentricity, namely 0.19 ± 0.03, not noticed in previous investigations of this binary system. An elliptic orbit is more consistent with the relatively long period of CV Serpentis, than the circular solution adopted in earlier work.

With our new ephemerides, the deep eclipse observed by Hjellming & Hiltner (1963, ApJ 137, 1080) occurred about phase 0, when the O type component is in front, and other observed light minima (see tabulation in Eaton, Cherepashchuk & Khaliullin 1985, ApJ 296, 222) about phase 0.6, when the WR star is in front of the system.

The different emission lines in the WR spectrum show different amplitudes of their radial velocity variation, as is also observed in other WR+O type binaries. We also find in the échelle CCD spectra obtained at CASLEO, that the absorption line profiles sometimes appear double-peaked, suggesting that more than one O type star might be present in the system.

[1]Facultad de Ciencias Astronómicas y Geofísicas, Universidad Nacional de La Plata, Argentina

[2]Member of Carrera del Investigador, CIC, Prov. de Buenos Aires, Argentina

[3]Visiting Astronomer CTIO, NOAO, operated by AURA for the NSF, USA

[4]Member of Carrera del Investigador, CONICET, Argentina

[5]Visiting Astronomer CASLEO, San Juan, Argentina

[6]Fellow of CONICET, Argentina