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SPECTRUM OF THE ENVELOPE AROUND PRIMARY IN RX Cas

RX Cas is a strongly interacting binary with an orbital period of $32^{d}.33$ where the main component is completely hidden by a thick envelope or disk formed from outflowing gas from the cooler secondary component. In the optical region the spectrum of the cool star dominates. The envelope obscures the light of the primary star and only an absorption shell-spectrum with emissions from the Balmer lines and the lines of Fe II, Ti II, [FeII] and [FeIII] are seen (Alduseva, 1987).

Therefore we attempted to derive the spectral class and luminosity of the envelope which re-emits radiation of the primary. We chose the orbital phase of secondary minimum in the transition stage from maximum to minimum of the physical activity (which has a period of 516 days) when we observed an optically thick envelope. This is when the K-giant was completely eclipsed. Two spectrograms with a moderate dispersion (44 Å/mm), obtained by V. Alduseva at the cassegrain focus of the 125 cm reflector of the Krimean Station of Sternberg Astronomical Institute, were analyzed. The methods for deriving and measuring the spectrograms were described by Alduseva (1987).

We used the spectroscopic temperature and luminosity criteria recommended by Wright (1966) for F–K stars. We measured the line-ratio intensities of pairs of lines in the region 4045 Å to 4340 Å that were sensitive to luminosity and temperature. The determination of equivalent widths of lines in the spectrum of RX Cas is a very difficult task because of the uncertainties in determining the continuum. For that reason we used only line-pairs which were close in wavelength and constructed a local pseudo-continuum. These results are listed in Table 1.

On the other hand, aecording to the photometric data available at this time in the secondary minimum of light:

$$B=10^{m}.43,\ V=9^{m}.28,\ B-V=1^{m}.15.$$

(Johnson's BV, corrected for instrumental and atmospheric extinction). If $E(B-V)=0^{m}.45$, then $(B-V)_{o}\cong 0^{m}.7$ which corresponds to a G2 giant (Allen, 1977) for normal stellar atmospheres.

The results show that in the transition stage to the minimum of the physical activity the envelope around primary imitates a pseudo-photosphere of a G2 giant with a luminosity excess of -1^{m}. The effective temperature is $T_{eff}\cong 5500$K. These results agree with the value of T_{eff} derived from photometric observations (Andersen et al., 1989): 5500K for minimum and 6000K for maximum of the physical activity, as well as with the results of the observations in the far ultraviolet (Plavec et al., 1981; Koch, 1982): gG0. From the

Table 1

λ_1/λ_2	RX Cas $W_{\lambda 1}/W_{\lambda 2}$	Sp	L	M_v
4072FeI/4078SrII	0.60	G0-G5	II-III	$+0^m.6$
4216SrII/4251FeI	1.30	G3	II-III	$-1^m.0$
4247ScII/4251FeI	1.35	G0-G5	II	
4258FeII/4261FeI	0.59	G0-G5	II-III	
mean	G3 III-II,	$M_v=-0^m.2\pm 0^m.8$		

study 22 objective prism spectra, Todorova (1990) derived the energy distribution of the spectrum of the outer parts of envelope and this corresponds to spectral type gG2-5. The luminosity excess may be connected with possible active areas on the surface of the envelope.

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