CIRCUMSTELLAR CaII LINES IN R Leo

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ABSTRACT. Qualitative results on the H and K CaII lines in R Leo are presented from spectra throughout all the cycle of this mira star. A scenario of explaining the observations by an outward shockwave is proposed.

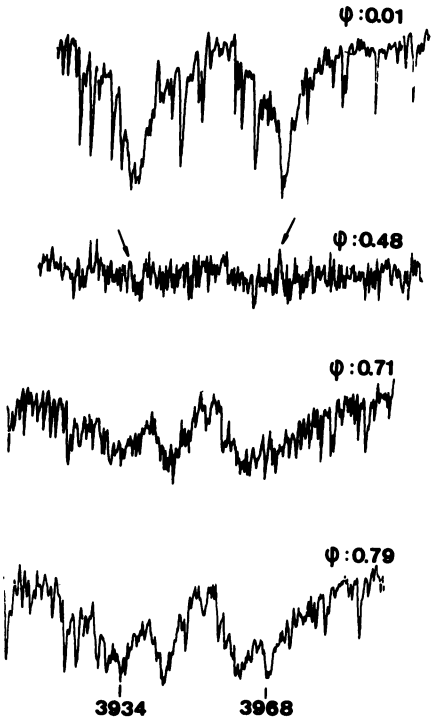
The figure shows tracings of the region of H and K CaII lines in spectra of the mira star R Leo that were taken at Haute Provence Observatory with a dispersion of 20 Å mm^{-1}. These spectra correspond to different phases of the light curve of R Leo.

A quantitative detailed study of these spectra is in progress, only qualitative results are presented here :
- Our observations confirm that an emitting hot region surmounted by an absorbing colder slab exists during the pre-minimun phases (Merrill, 1952 and Kraft, 1957).
- During the pre-maximum phases, largely blueshifted emission features seem to appear. They could be due to the front of a shockwave in the lowest region of the Ca circumstellar envelope.
- At the phase 0.48, the H and K CaII central features appear in emission.

So we propose the following scenario : the emission is due to an outward shockwave which reaches the Ca envelope during the premaximum phases. The emission lines are self-absorbed by the overlying cool ions. With increasing phase, the heated layer is higher and higher within the atmosphere and the absorbing slab diminishes, the apparent blueshift of the emission features decreases and tends to correspond to the velocity of the other emission lines due to the shock. Near the minimum, the hot layer is high in the atmosphere, so the absorbing slab disappears.

This agrees with the study of the infrared CaII triplet (Contadakis and Solf, 1981), the observations of H_α lines (Gillet et al., 1983) and the deduced model of shockwave (Gillet et al., 1985).

I. Appenzeller and C. Jordan (eds.), Circumstellar Matter, 375–376.



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https://doi.org/10.1017/S0074180900156761 Published online by Cambridge University Press