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SIMULTANEOUS PHOTOMETRY AND SPECTROSCOPY OF THE B2(e) VARIABLE STAR HD 45677

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ABSTRACT

Light variations are observed for HD 45677 in the visible, if they are due to obscuration by circumstellar patchy dust clouds, part of the stellar UV and visible radiations are back-scattered inside the extended atmosphere surrounding the star. The excitation of all atoms and ions in the envelope is thus affected, and the result is seen most for the atoms moving towards the observer: the intensity variations of the blue emission wings of the Balmer lines in opposite phase with simultaneous variations of the stellar flux are therefore understandable.

The full paper showing the data and giving correlations between equivalent width and magnitudes and/or colours is presently in preparation and will be published elsewhere.

DISCUSSION

D. ALLEN: If the scale of your last slide is right, I don't see why the material behind the star shouldn't also be affected by the backscattering. The star isn't big enough to occult it all.

SWINGS: The great volume of gas in front of the star absorbs the backscattered radiation.

D. ALLEN: You're saying that it is optically thick, then?

SWINGS: Almost, at least between the star and the dust condensation responsible for the backscattering.

SMAK: Are there any IR data available on HD 45677 that could be used to say more about the dust envelope?

SWINGS: Yes, an energy distribution of HD 45677 in the visible and in the near infrared has been published by Swings and Allen (Ap.J. Lett., 167, L 41, 1971); it shows the presence of a strong IR excess due to thermal reradiation in a dust shell (or ring) surrounding HD 45677.

ABBYANKAR: How do you get dust near a hot Be star like HD 45677?

SWINGS: The strong P Cygni profiles indicate important mass loss from the star. At sufficiently large distances there can be an accretion phenomenon and formation of grains at temperatures 800°K and lower. The dust will probably appear in condensations and will not be unifomrly distributed in a ring around the object.