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DETECTION OF A NEW Be STAR - γ Lup

It is accepted in astronomical community that Be stars may be defined as non-supergiant early type stars showing Balmer emission lines in their spectra (Slettebak, 1979). Origin of the emission lines is from the extended gaseous envelopes surrounding the atmosphere of the central object. In general most of the Be stars are rapid rotators and they show irregular variability both spectroscopically and in magnitude. Line emitting envelope around the Be star may disappear for a long period of time, leaving the central star and the spectrum of the central star apparently looks like a normal absorption-line B-type spectrum. So, with this picture in mind, a Be star may be regarded as B-type star surrounded by gaseous envelope and the envelope has formed due to the material ejection from the central star or by mass transfer from a hypothetical companion in the suspected binary system. Now the question is that whether all B-type stars will become Be stars or not. If not all, what type of B stars are able to form gaseous envelope around it? Another information is essential in finding the elusive cause(s) for the Be phenomenon is that the time scale required for a star to make a transition from a normal B star to a Be star. Thus the study of the spectrum of a star which is in transition from a B-type to a Be star may provide important information for many major unsolved questions of Be phenomenon. Here we present a new spectrum of γ Lup (HR 5776, HD 138690, B2 IV, v sini = 320 km/s) which was a B-type star with rapid rotation. Spectroscopic observations of γ Lup in the H_α region were obtained on 22-25 March 1987 with the Bhavanagar spectrograph using a grating of 1800 grooves/mm at the cassegrain focus of the 0.75 m reflector of Vainu Bappu Observatory, Kavalur, India. The reciprocal dispersion at H_α is 16 A/mm on 09802 emulsion. Obtained spectra of H_α profiles are shown in Fig 1. In Fig. 1 the vertical arrows show the emission peaks within the absorption profile of H_α. In the H_α profile of γ Lup we find two to three emission peaks. Different peaks of central reversal of emission may be due to self-absorption of line radiation in the circumstellar envelope. The width of the H_α profile is very broad which may be due to strong electron scattering in the envelope. The wavelengths of different emission

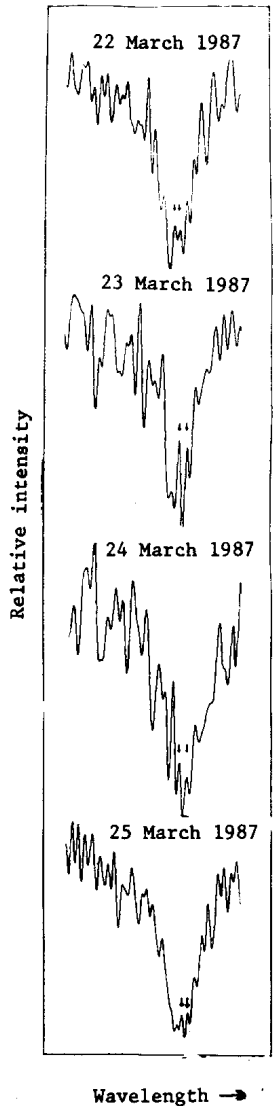

Fig. 1. Spectra of γ Lup in the H_α region. Data of observations have been mentioned along with each spectrum. Wavelength decreases along the right hand side i.e. towards the arrow mark. Vertical arrow marks indicate the peak point of the emission. All spectra have been expressed in terms relative density.

peaks are greater than 6562.817 A which indicates the material flow away from the line of sight of the observer to the star. This material flow may be mainly due to the mass ejection from the central star. At present we believe that high rotational velocity of γ Lup has played the important role for the material ejection from the star. This early type star which has undergone a transition from a B-type to Be may give a lot of important information for understanding the unsolved problems of Be phenomenon. Continued regular observation of this star is suggested.

K. K. GHOSH, K. KUPPUSWAMY, K. JAYKUMAR
M. J. ROSARIO, and C. VELU
Indian Institute of Astrophysics, Vainu Bappu Observatory
Kavalur, Alangayam, N. A., T. N. 635701, INDIA

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