

BD+47°819, an A-type Flare Star with Peculiar Spectroscopic Variation

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Stellar flares are one of the most challenging problems in astrophysics. Up to now, most of the detected flare stars are of late spectral type (e.g. UV Cet type stars etc.). Non-classical flare stars with early spectral type are very rare.

Recently, an A5-type flare star BD+47°819, near the open cluster α Persei, was discovered (Wang 1993). The flare U amplitude was 1^m.5 in ten minutes. The V magnitude of the star was 9^m.25 during the quiescent state.

On 1993 February 28 and March 1, spectroscopic observations of BD+47°819 were made with the 2.16 m telescope of Beijing Astronomical Observatory. A grating with a dispersion of 5 nm/mm was used. Figs. 1 (a) and (b) show the observed spectra in the two nights. The exposure time for each spectrum was 15 minutes. Fig. 1 (a) shows a strange feature, an "emission line" at around 676 nm. Is this a real feature?

Clearly, the six $H\alpha$ profiles in (a) were nearly of the same shape. There were no large variations. But in (b), the $H\alpha$ profiles show relatively large variations, which present the tendency from broad to narrow in order. It seems that the stellar photospheric activity on March 1 was more violent than that on February 28.

Some phenomena could be explained by a binary model, the bright component being an A type star and the faint one a dMe star. Another interpretation would be in terms of an envelope model. Since both the binary model and the envelope model cannot fully explain the phenomena in BD+47°819, the question is: what kind of variable star is it? Certainly, further observations, both spectroscopical and photometrical, are needed. Also, achival plates should be checked.

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References

Wang J.-J., 1993, IBVS 3836

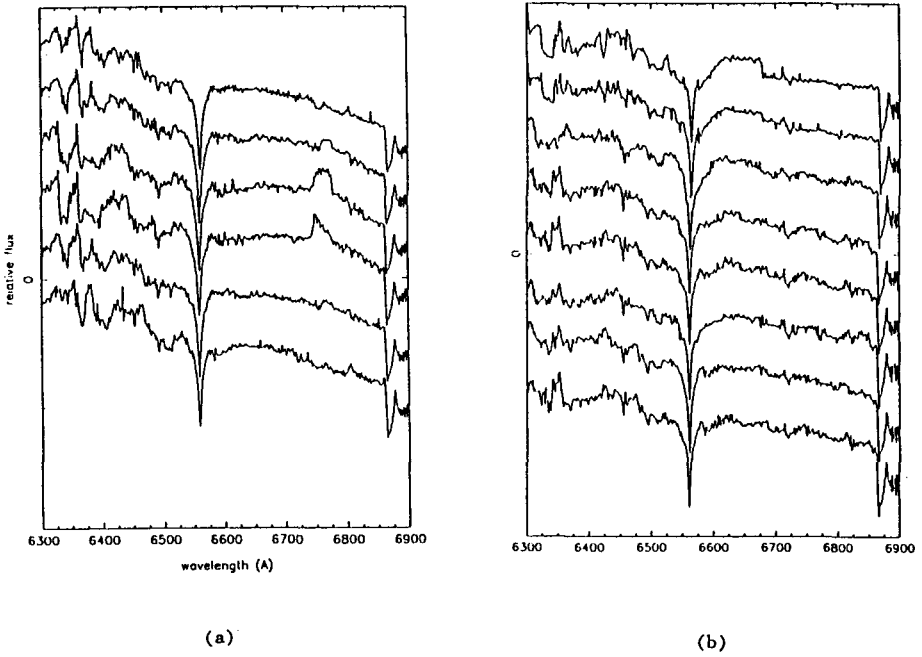


Fig. 1. Results of the spectroscopic observations of BD+47°819