Astronomical and Astrophysical Transactions (*AApTr*), 2012, Vol. 27, Issue 3, pp. 439–440,
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A new luminous variable in M33

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Received 20 November, 2008

We present a new LBV star (Humphreys and Davidson 1994) in M 33 located in the nuclear region. The star shows numerous Fe II and [Fe II], strong hydrogen emissions in the spectrum as well as some nebular lines. Many Ti II absorption lines were

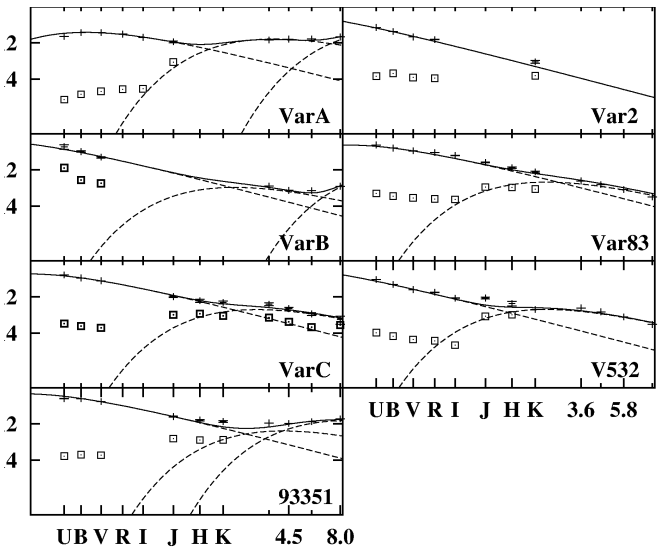


Figure 1 Spectral energy distributions of LBV stars in M 33. Observed data are shown by squares, data corrected for interstellar absorption are shown by crosses as well as their best fit BB models.

detected, their radial velocity shifted by ≈ -30 km/s relative to emission lines. The star is variable over seven years with $0^m.5$ variations over a year. We studied its spectral energy distribution together with six other confirmed LBVs in M 33 using homogeneous data and methods (Fig. 1). We found the star's bolometric luminosity

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in solar units to be $\log L/L_{\odot} \approx 6.27$ (Fig. 2), a surface temperature of $T \sim 16000\,\mathrm{K}$ and black body temperatures of two dust components of $T \sim 900$ and $420\,\mathrm{K}$.

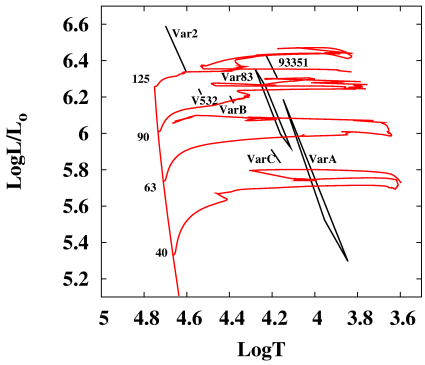


Figure 2 Temperature–luminosity diagram for seven studied LBVs in M 33. In Var 2, Var B, Var C and 93351 we used only one value of interstellar extinction, the segments indicate a range of acceptable temperatures. In other stars (Var 532, Var A, Var 83) we used two most probable values of extinction, inner areas show the acceptable L, T values (the upper point in Var A is the only still acceptable value). Stellar evolution tracks for $Z = 0.007$ stars are plotted.

References

R.M. Humphreys and K. Davidson. The luminous blue variables: Astrophysical geysers. *PASP*, 106:1025–1051, October 1994.