

The January 2015 outburst of a red nova in M 31

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Abstract

© ESO 2015. Context. M31N 2015-01a (or M31LRN 2015) is a red nova that erupted in January 2015 - the first event of this kind observed in M 31 since 1988. Very few similar events have been confirmed as of 2015. Most of them are considered to be products of stellar mergers. Aims. Results of an extensive optical monitoring of the transient in the period January-March 2015 are presented. Methods. Eight optical telescopes were used for imaging. Spectra were obtained on the Large Altazimuth Telescope (BTA), the Gran Telescopio Canarias (GTC) and the Rozhen 2 m telescope. Results. We present a highly accurate 70 d light curve and astrometry with a 0.05" uncertainty. The colour indices reached a minimum of 2-3 d before peak brightness and rapidly increased afterwards. The spectral type changed from F5I to F0I in 6 d before the maximum and then to K3I in the next 30 d. The luminosity of the transient was estimated to be $8.7-2.2^{+3.3} \times 10^5 L_{\odot}$ during the optical maximum. Conclusions. Both the photometric and the spectroscopic results confirm that the object is a red nova, similar to V838 Monocerotis.

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Keywords

cataclysmic variables, Novae