A near-infrared catalogue of the Galactic novae in the VVV survey area

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Abstract

Context. Near-infrared data on classical novae contain useful information about the ejected gas mass and the thermal emission by dust formed during eruption, and provide independent methods to classify the objects according to the colour of their progenitors, and the fading rate and features seen after eruption. The VISTA Variables in the Vía Láctea survey (VVV) is a near-IR ESO Public Survey mapping the Milky Way bulge and southern plane. Data taken during 2010–2011 covered the entire area in the JHKs bands plus some epochs in Ks-band of the ongoing VVV variability campaign.Aims. We used the VVV data to create a near-IR catalogue of the known Galactic novae in the 562 sq. deg. area covered by VVV. We also compiled the information about novae from the variability tables of the VVV variability campaign.Methods. We used the novae list provided by VSX/AAVSO catalogue to search for all objects within the VVV area. From the 140 novae, we were able to retrieve the JHKs colours of 93 objects. We also checked in the ongoing VVV variability campaign for the light curves of novae that erupted in the last years.Results. The VVV near-IR catalogue of novae contains JHKs photometry of 93 objects completed as of December 2012. VVV allows to monitor objects within up to ΔKs ~ 10 mag range. VVV images can also be used to discover and study novae by searching for the expanding shell. Since objects are seen at different distances and reddening levels, the colour–magnitude and colour–colour diagrams show the novae spread in magnitude as well as in colour. Dereddened colours and reddening-free indices were used with caution and cannot be a good approach in all cases since the distance and spectral features prevent more conclusive results for some extreme objects. Light curves for some recent novae are presented.Conclusions. Thanks to its high spatial resolution in the near IR and wide Ks-range, the VVV survey can be a major contributor to the search for and study of novae in the most crowded and high-extinction regions of the Milky Way. The VVV survey area contains ~35% of all known novae in the Galaxy..

Keywords

Novae cataclysmic variables, Galaxy stellar content, Catalogs, Surveys.