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V838 MON: A NEW TYPE OF ERUPTIVE VARIABLE?

S. Kimeswenger,[1] C. Lederle,[1] S. Schmeja,[1] and B. Armsdorfer[1]

We present observations and first results of the peculiar variable V838 Mon. First stated to be a nova, we assign V838 Mon, together with V4332 Sgr, to a new class of eruptive variables.

V838 Mon was discovered on 2002 Jan 6 (Brown et al. 2002). We started a photometric campaign on 2002 Jan 14 using the Innsbruck 60 cm telescope, to find low periodic variability as a signature for the orbital period of the target (Kimeswenger & Lederle 2002). On Feb 2 the second 'outburst' was monitored in detail (Kimeswenger, Lederle, & Schmeja 2002a). The $BVRI_c$ sequences from 1018 frames taken in 31 nights with the 60 cm telescope in Innsbruck were used, together with NIR and MIR data from the literature to model the spectral energy distribution (SED).

While the optical and the NIR data are nicely reproduced using a single temperature model, the MIR data show significant excess. The temperatures of the object are too low for a classical nova-like system. The late stages are very similar to the evolution of the mysterious eruptive variable V4332 Sgr in 1994 (Martini et al. 1999). As that target was in Solar conjunction before its discovery, we are unable to verify possible parallels in the earlier evolution of the outburst. Nevertheless, we assign V838 Mon and V4332 Sgr to a new class of eruptive variables (Munari et al. 2002; Kimeswenger et al. 2002b).

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[1]Institut für Astrophysik der Leopold-Franzens-Universität Innsbruck, Technikerstr. 25, A-6020 Innsbruck, Austria (Stefan.Kimeswenger@uibk.ac.at).

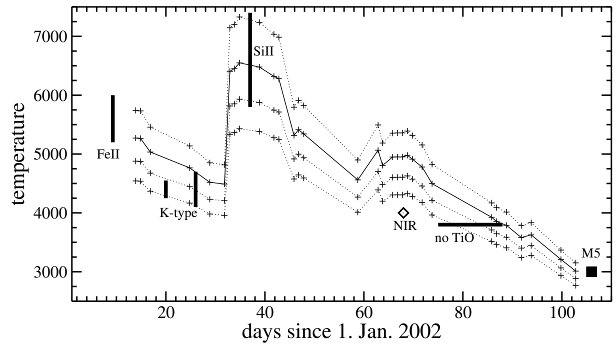

Fig. 1. The evolution of the photosphere temperature using blackbody fits to the photometry at different interstellar foreground extintion (from top to bottom: $E(B-V) = 0.8$, 0.7, 0.6, and 0.5). From the spectroscopy (Fe II at day 10 and Si II only just after the February outburst) we derive $0.7 < E(B-V) < 0.9$. Zwitter & Munari (2002) find K-type just before the outburst. This leads to somewhat lower values. The NIR continuum (Geballe et al. 2002) suggests values below 0.5. The absence of TiO bands during March limits $E(B-V)$ to values above 0.7 mag. Finally, the spectroscopy of Rauch & Kerber (2002) give us $0.7 < E(B-V) < 0.8$. The value of $E(B-V) = 0.7$ is the best fit to the whole time series.

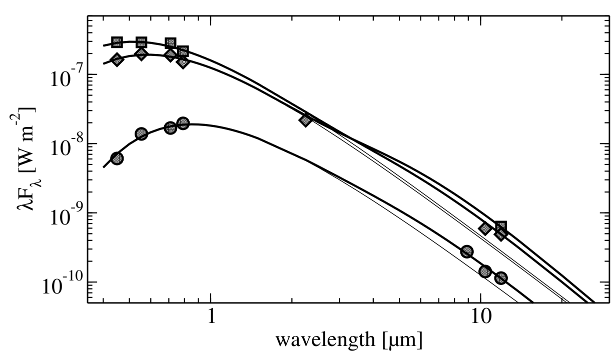

Fig. 2. The model of the visual to near infrared photometry gives us a 10 μm flux excess. This excess was already obvious before the second outburst and increased steadily. At dense radiation fields the gray dust temperature is given by the bolometric luminosity of the star and the distance r of the dust from the star. Assuming an AGB- or C-star like condensation model with an average $T_C = 750$ K and a distance of 650 pc, the condensation is possibly at $r = 3 \times 10^{13}$ cm in January and $r = 1.4 \times 10^{14}$ cm in February.