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FIRST SPECTRUM OF NSV 19451 – THE WRONG STAR?

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The star NSV 19451 has been found to be variable by Kolrvatykh (1983) while observing stars in the Hydra–Centaurus region and especially the Mira Cet type variable EW Hya. He found that EW Hya did not show high enough variations ($14^{\rm m}-16^{\rm m}$ pg, $P = 250^{\rm d}$), and thus considered its classification doubtful. Instead, in its vicinity, he found the variable star who later got the designation NSV 19451. This star varied around 1 mag between $V = 16\overset{\rm m}{.}2$ and $17^{\rm m}$ and is as such listed in the catalogue by Kazarovets et al. (1998) with the probable classification as a cataclysmic variable of U Gem subtype. It has thus been included into the atlas of Downes et al. (2001) who also provide a finding chart of the object.

Recently, NSV 19451 has been observed by Berto Monard (vsnet–alert 8120) who also listed the occurrences of the object in various catalogues. Taking also these listed values into account, he found the object to be a 'reasonably constant white–blue star around $V = 14\overset{\rm m}{.}4$'. He suspected the object to show emission lines indicating the cataclysmic variable nature, and concluded that the quoted magnitude range in the atlas of Downes et al. (2001) seems to be incorrect. Note that the atlas, as living edition, has been updated immediately and the magnitude range now includes Monards measurements as well.

To check the classification of NSV 19451 as cataclysmic variable and especially as U Gem type star, we performed spectroscopic observations using the ESO Faint Object Spectrograph and Camera (EFOSC2) at the 3.6 m telescope on la Silla, Chile. Two spectra, each of 10 min exposure time, have been obtained on 2004-05-01 at UT 02:25 using grism #6 and a $1''$ slit.

Standard reduction has been performed with IRAF. The BIAS has been subtracted and the data have been divided by a flat field, which was normalised by fitting Chebyshev functions of high order to remove the detector specific spectral response. The two spectra have been combined and then optimally extracted (Horne, 1986). Wavelength calibration yielded a final FWHM resolution 1.2 nm and a spectral range of 390 nm to 790 nm. The spectrum has been corrected for the instrument function and was flux–calibrated using the spectrophotometric standard LTT 3218. However, as the night was not of photometric condition, the absolute flux–values have to be regarded with caution.

The resulting spectrum is plotted in Fig. 1. It is dominated by absorption lines, mainly the Balmer series, Ca I and II, Na I, and the strong G–band at 430 nm. We have used the catalogues of Pickles (1985) and Silva & Cornell (1992) for classification and find the object to match a medium/late G–type dwarf. The best fitting template spectrum, of G6–8V type by Silva & Cornell has been over–plotted for comparison. We have found no signal of any emission lines or any other spectral feature which might indicate that

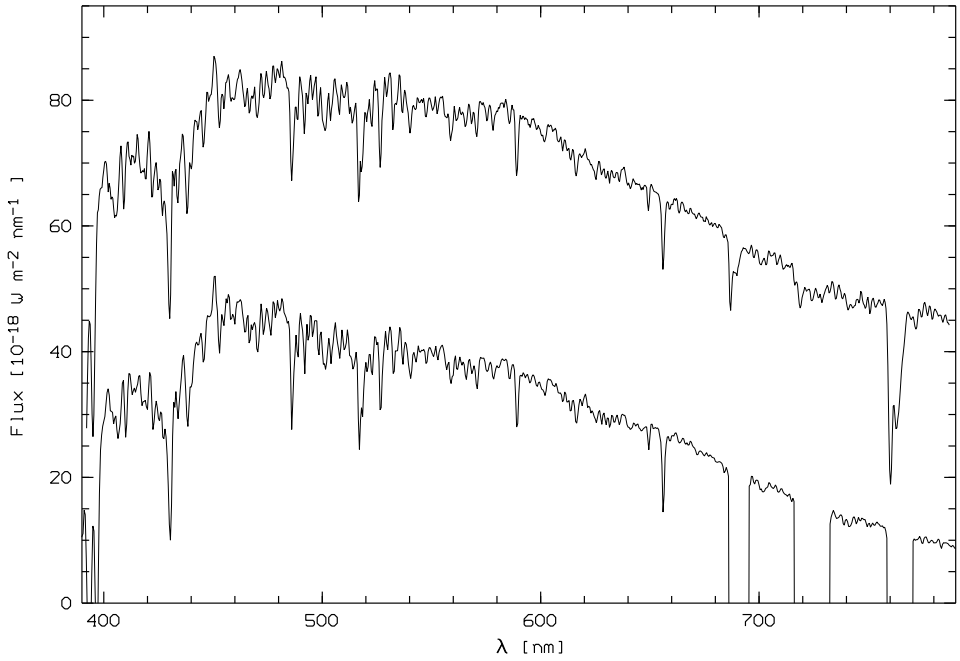

Figure 1. The optical spectrum of NSV 19451 (upper plot) and the best fitting template spectrum, a G6–8 type main sequence star (Silva & Cornell, 1992). Scaled to the same average flux value and arbitrary shifted down for purpose of clarity.

NSV 19451 is a cataclysmic variable. Instead, it seems to be a perfectly normal G–type star and most probably is not variable at all.

This conclusion is in perfect agreement with the findings of Monard that NSV 19451 does not show any light variations. However, Kolrvatykh (1983) observed its variability. So either, the object has been variable in the past but is behaving like a constant G–type star now, or the variable star observed by Kolrvatykh and listed as NSV 19451 by Kazarovets et al (1998) and the G–type star which is believed to be NSV 19451 are not the same object.

We rather believe the latter conclusion to be the case. For once, there is no variable type known which in outburst ($V = 14^{\rm m}$ now instead of 16–17$^{\rm m}$ before) resembles a G–type dwarf. On the other hand, the finding chart given by Downes et al. (2001) is done via coordinate match only and there are several fainter stars in the vicinity of the labelled object who might be the real candidate for Kolrvatykh's variable star. In fact, as Kolrvatykh does not give any coordinates nor uncertainties of the star he has observed but just states that it is in the vicinity of EW Hya, it is rather difficult to judge the ambiguity in the finding chart.

Time resolved photometry on all stars in the vicinity of the proposed position should help to clarify this issue and to recover the true variable NSV 19451 and maybe even the ambiguous Mira–star EW Hya.

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