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PHOTOMETRY AND SPECTROPHOTOMETRY OF THE NEW VARIABLE STAR IRAS 20192+3025

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IRAS 20192+3025 is a red giant star located at R.A. = $20^{h}21^{m}17\overset{s}{.}48$ DEC. $=+30^{\circ}34'41\overset{''}{.}6$ (Equinox J2000, Epoch 2001.644). Photometric and spectrophotometric observations were taken at West Skies Observatory (MPC code 451) in Mulvane, KS, USA. The telescopes used were 0.2m and 0.25m Schmidt-Cassegrains. V and I_{kc} filters were used in conjunction with an SBIG ST-8 CCD camera. The observations were reduced to the Johnson V and Cousins I band photometric systems. The comparison star was HIP 100384 (V=6.77, B−V = 0.261 ± 0.011, V−I_c = 0.22 ± 0.03) and the check star was HIP 100369. The individual observations are available from the IBVS website as 5198-t1.txt .

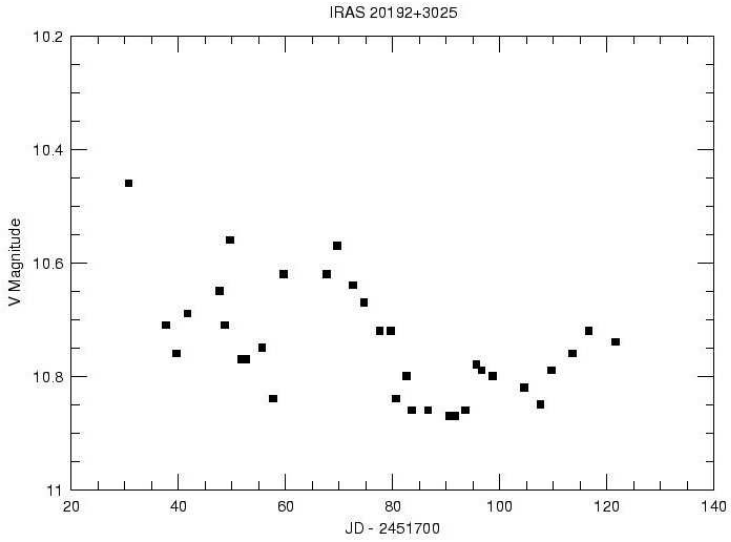

Figure 1. V band photometry of IRAS 20192+3025. The V band photometry demonstrates multi-periodic behavior.

A spectrum was taken using a non-objective slitless spectrometer (West et al. 2000). The spectrometer consists of a Rainbow Optics grating mounted to the CCD camera.

Wavelength calibration was accomplished using the hydrogen lines from A type stars and a laboratory mercury emission lamp. The wavelength accuracy is ± 20 Ångström. The spectrum is flux calibrated relative to Vega. The "+ Cont." term in the flux represents the difference in air mass between the target star and the Vega calibration spectrum. The signal-to-noise for the spectrum is greater than 10. The slope of the spectrum and the TiO band heads at 5167, 5847, 6536, 7054, 7594 Ångström are consistent with a M4III star (Celis 1984, and Serote Roos et al. 1996).

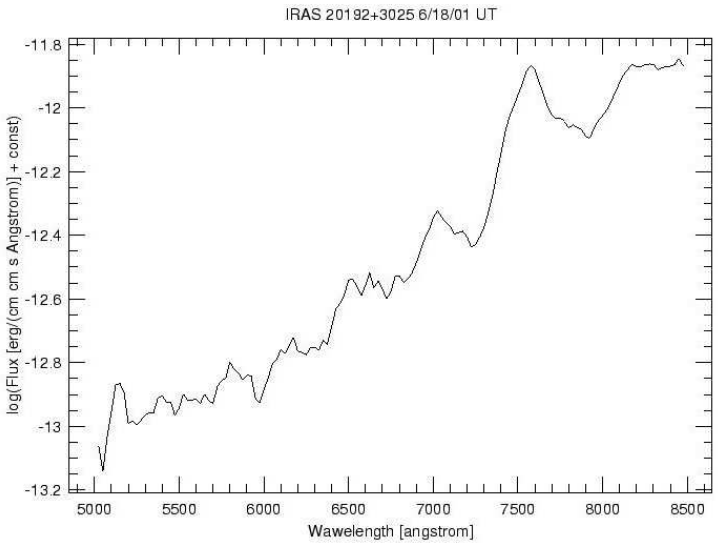

Figure 2. A low-dispersion spectrum of IRAS 20192+3025 taken on 6/18/01 with a non-objective slitless spectrometer. The TiO bands are evident.

This variable star is not listed in the GCVS. Based on the photometry and spectrophotometry reported in this paper, the type of variability is consistent with the SRB designation. Averages for the photometry are: V = 10.74, I_c = 7.02, and V−I_c = 3.72. Stars with this large a V−I_c fall into the M6 spectral class (Bessell). Analysis of the V and I_c band photometry with the computer program AVE shows a multi-periodic waveform. The two dominant periods from the 94 days of observation are 20.9 ± 2.4 and 40.6 ± 1.3 days. It is not yet clear if these periods are significant, or if they represent independent variations in the brightness of the star. Observations over a longer baseline will be required to resolve all of these issues. Based on the photometry and spectrophotometry one concludes that IRAS 20192+3025 is a M4III to M6III variable star of type SRB.

References:

Bessell, M. S., 1990, *Pub. Ast. Soc. Pacific*, **102** 1181
Celis S. L., 1984, *Astron. J.* **89**, 527
Serote Roos, M., Boisson, C., Joly, M., 1996, *Astron. Astrophys. Suppl.*, **117**, 93
West, J. D., Alexander, D. R., 2000, *Bull. Am. Ast. Soc.*, **No. 32**, 688