

OGLE II Sco_SC1 72677: A Post Asymptotic Giant Branch or a Young Stellar Object Variable?

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Star Name:	OGLE II Sco_SC1 72677		
Coordinates (J2000):	16 40 24.88, -44 24 53.2		
Variability type:	RCB:/IA.;	Limits, System:	13.5-14.7 (I);
Period:		Epoch:	JD

Remarks:

OGLE II Sco_SC1 72677 has a lightcurve (Szymanski 2005, Udalski et al. 1997) somewhat reminiscent of stars of type RCB, with a slow recovery from fading at the beginning of the data and the suggestion of a moderately rapid decline in brightness towards the end of the data. However, the recovery phase is somewhat rapid compared to a typical RCB star, and the seasonal gaps hide whether faint events occurred at those times.

The spectral energy distribution (SED) in the near infrared from 2MASS, MSX6C and IRAS data does not support a post Asymptotic Giant Branch star (post AGB), however, as can be seen from examining the SEDs of known post AGBs (e.g. Szczerba et al. 2007; <http://www.ncac.torun.pl/postagb>) where usually the flux at 60 and 100 microns shows a distinct downturn.

Models and SED fits for Young Stellar Objects (YSOs) (Robitaille et al. 2007; <http://caravan.astro.wisc.edu/protostars/>) better fit the situation, with the extended envelopes of stage one YSOs usually leading to higher fluxes at the longer IRAS wavelengths. This would make the star one of a class of Herbig Ae/Be stars known to sometimes undergo obscuration events. However, these are usually somewhat analogous to days long eclipsing events, and often quasicyclic, rather than being longer periods of fading.

The 2MASS J-Ks colour of approximately 2.1 is appropriate for a Carbon star, but could also easily that of a much extincted hot massive star with infrared excess due to circumstellar material and the object does lie within the part of the sky occupied by the OB Association Ara OB1.

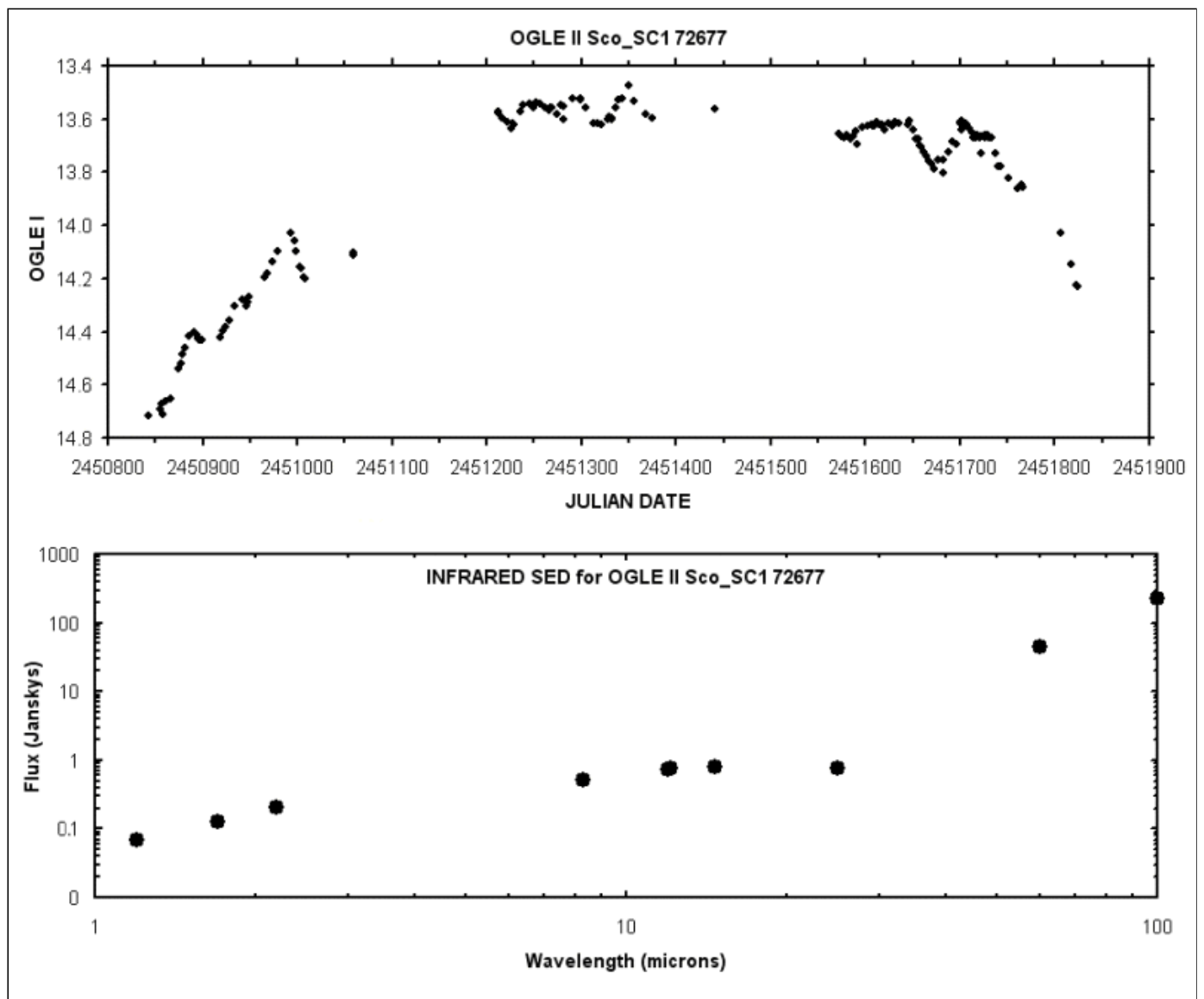
Further it is apparently difficult to separate post AGB stars and YSOs merely on their infrared SEDs (T.P. Robitaille, private communication).

Therefore the variability type of the star, and even its evolutionary stage, remain unclear, although it is very clearly variable.

References:

- Robitaille, T.P., Whitney, B.A., Indebetouw, R., Wood, K., 2007, *Astrophys. J. Suppl. Ser.*, 169, 328
Szczerba, R., Siódmiak, N., Stasinska, G., Borkowski, J., 2007, *Astron. Astrophys.*, 469, 799
Szymanski, M., 2005, *Acta Astronomica*, 55, 43
Udalski, A., Kubiak, M., Szymanski, M., 1997, *Acta Astronomica*, 47, 319

Light Curve



Top Panel: Lightcurve for OGLE II Sco_SC1 72677 showing both a recovery event and a fading event. Bottom Panel: Spectral Energy Distribution in the infrared from 2MASS, MSX6C and IRAS data with axes scaled to log base ten.

Data Source

1. [sco_sc1_72677.dat](#)