

- For the **first time**, we place limits on the time taken to **re-establish accretion** after a recurrent nova outburst.
- Exploration of the **accretion mechanism** yields no conclusive evidence favouring RLOF over direct wind accretion.
- Post-outburst accretion rates imply a **longer outburst recurrence interval under the TNR model** than is observed in RS Oph.

Flickering

Photometric data obtained over a two-week period in 2006 October reveal the resumption of optical flickering (Worters et al. 2006), and hence accretion, in RS Oph (fig. 1). Applying criteria from Gromadzki et al. (2006), we find:

- Flickering is definitely evident in RS Oph on 8 out of 11 nights observed
- Significant flickering is detected on timescales of 10 minutes to 2 hours
- V-band flickering amplitudes ranging from 0.06 mag to 0.32 mag are detected (fig. 1).

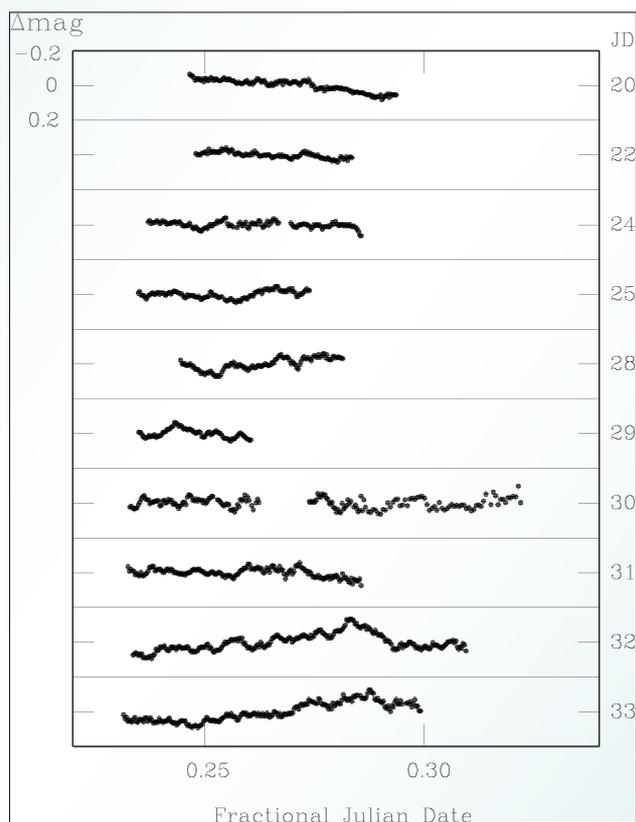


Figure 1. Ten nights' differential V-band lightcurves of RS Oph. Magnitudes are normalised to the mean value for each night to illustrate relative flickering amplitudes. Numbers down the right-hand margin are JD - 2454000.

Mass Transfer Rate

We constrain the mass transfer rate by relating the time taken to re-establish the accretion disc to the flickering timescale. We obtain:

$$3.7 \times 10^{-10} \leq M_{\text{acc}} \leq 4.1 \times 10^{-9} M_{\text{sun}} \text{ yr}^{-1}$$

Nagae et al. (2004) indicates that these limits on M_{acc} span the range of accretion rates required for direct wind accretion and Roche lobe overflow (Worters et al., 2007).

Outburst Mechanism

The outburst recurrence interval in RS Oph averages ~ 20 yr. Yaron et al. (2005) predict a TNR outburst recurrence period ranging from $\sim 200 - 1000$ yr for a system with a mass transfer rate in the calculated range onto a hot $1.4 M_{\text{sun}}$ white dwarf. Thus the mass transfer rate we derive is insufficient to result in outburst via TNR in RS Oph.

Conclusions

1. Statistically significant flickering is detected in RS Oph on days 241 to 254 of the 2006 outburst, consistent with the re-establishment of accretion between days 117 and 241 of outburst.
2. The mean V magnitude decreases by ~ 0.5 mag from 11.4 to 11.9 mag over the two week observational period.
3. Calculated limits on the white dwarf accretion rate span the range required for direct wind accretion and RLOF mechanisms. We therefore find no conclusive evidence favouring one mechanism over the other in RS Oph.
4. Current models are not sufficiently complete to confidently determine the accretion and outburst mechanisms in RS Oph.

References

- Gromadzki et al., 2006, Acta Astr., 56, 97
Nagae et al., 2004, A&A, 419, 335
Worters et al., 2006, CBET 697
Worters et al., 2007, MNRAS, in press
Yaron et al., 2005, ApJ, 623, 398