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INACTIVE STATE OF MV LYRAE

The cataclysmic variable MV Lyrae is a candidate for a class of polars (Vojkhanskaya et al., 1978, Vojkhanskaya and Mitrofanov, 1980). But unlike other AM Herculis-type objects the polarization of MV Lyrae is very small, its variations are not correlated with brightness changes (Efimov and Shakhovskoy, 1980). The system is identified with an X-ray source H 1901+43 (Mason et al., 1979).

The investigation of archive plates of Sonneberg (Wenzel, 1980) and Moscow and Odessa collections (Andronov and Shugarov, 1982) shows that from the beginning of this century MV Lyrae was mainly in its high state ($B \leq 14^m$). Inactive states lasting from several months to a year have a tendency to gather, the interval between them may be as long as 17 years.

In 1979 the system's brightness fell from $13^m.5$ to 18^m (Romano and Rosino, 1980). The decline lasted for 40-60 days; this may be compared with the value for AM Herculis (Andronov et al., 1983).

Observations were taken with the 50-cm reflector and 40-cm astrograph of the Southern Station of Sternberg State Astronomical Institute and the 45-cm telescope of Odessa Astronomical Observatory. We used the B-magnitudes of comparison stars taken from Andronov and Shugarov (1982). The 1979-1982 light curve is shown in Figure 1.

In the inactive state one can observe flares with an amplitude of 3^m lasting 1-2 months - similar in appearance to the photometric behaviour of cataclysmic variable V 794 Aquilae (Petrochenko and Shugarov, 1982). In addition, the mean brightness may undergo changes of $0^m.3$ when $B \approx 17^m$ and $1^m.2$ when $B \approx 16^m$. We note that the present inactive state is not only the deepest, but the longest as well, compared with other detected minima. Recent observations show that MV Lyrae is now faint. On 2 May 1983 the brightness was about $17^m.5$ (not shown in Figure 1).

If, as Robinson et al. (1981) suggested, we see the binary system entering the 2-3 hour period gap, it is unlikely that MV Lyrae will return to its practically stationary active state for some 10^9 years.

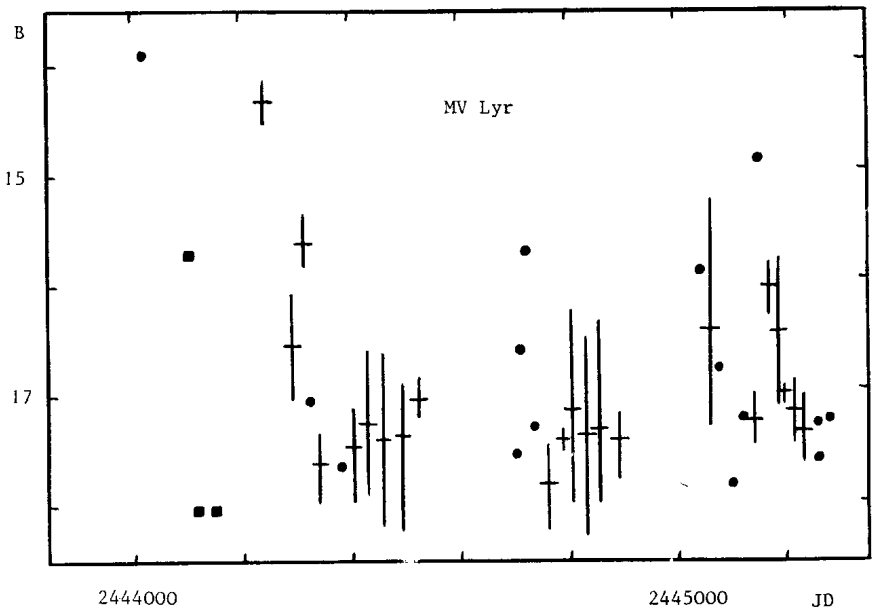

Figure 1

The 1979-1982 light curve of MV Lyrae. Filled squares correspond to the observations of Romano and Rosino (1980)

Individual light curves in the 1981-1982 inactive state are shown in Figure 2. The amplitude of brightness changes may reach $1^m.2$ which is really greater than the values of $0^m.1 - 0^m.5$ obtained for the active ($B \approx 12^m.5$) state (Walker, 1954).

There is an interesting feature on the light curve when $B = 17^m.3$. Sometimes one may observe "stationary" states lasting 2-3 hours that were detectable from our data and the results of photoelectric study (Robinson et al., 1981).

Photographic observations cannot be fitted on one light curve with a spectroscopic period of $0^d.1336$ (Schneider et al., 1981), but the time-scale of brightness variations is not in disagreement with this value. If the orbital inclination is small ($i \approx 14^o$) (Schneider et al., 1981), possible orbital variations may be saturated by fluctuations connected with the system's instability. The statistical amplitude increase in the inactive state compared with the active state may be attributed to accretion flow in-

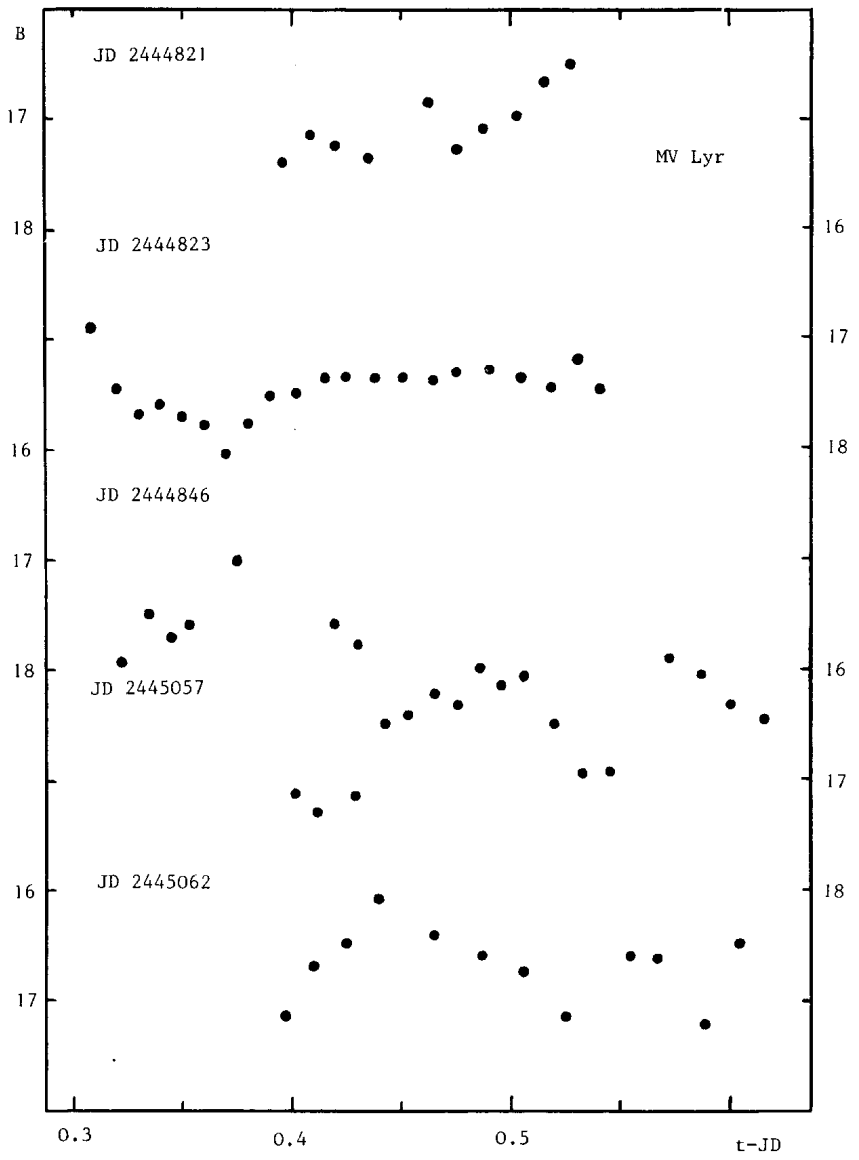

Figure 2
Individual light curves of MV Lyrae

stabilities when the relative contribution of separate inhomogeneities to the luminosity increases. If accretion is completely reduced the luminosity will decrease and variability disappears. Though, as one might expect, separate inhomogeneities may penetrate from the secondary's envelope through the inner Lagrangian point to the primary's Roche lobe. In this case separate flares might be observed on the light curve.

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