

DWARF NOVA EX HYDRAE

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Abstract

Extensive photoelectric observations of EX Hya were obtained between 1962 and 1976 at different telescopes and observatories. Evaluation of the data reveals a decrease of the orbital period at the rate $\dot{P} = -5.2 \times 10^{-12}$. This period change is likely caused by mass transfer with angular momentum exchange between orbital motion and disc rotation on a time scale which is considerably shorter than the corresponding Kelvin - Helmholtz time scale. A rough estimate of the mass transfer rate gives $\dot{M} \approx 2 \times 10^{-9} M_{\odot}/\text{yr}$. Gravitational radiation losses are negligible in the evolution of EX Hya. Furthermore we report the detection of a periodic modulation of the light-curve with a period of 0.046546447 days and mean amplitudes between 0.2 and 0.4 mag. ("67-minute cycle"). This oscillation remained coherent over the 14 years covered by our observations. The 67-minute variability resembles superhumps seen at supermaxima in SU UMa-type stars with the difference that it shows a 2:3 commensurability to the orbital period. We mention either (i) asynchronous rotation or pulsations of the red component, or (ii) asynchronous rotation of the magnetic primary, or (iii) resonances in the outer regions of the accretion disc as possible sources for this periodicity.

The detailed discussion of the periodic and secular variations in the light-curve of the dwarf nova EX Hya will appear in "Astronomy and Astrophysics".