Circular polarimetry of V1082 Sgr: an extraordinary long-period magnetic cataclysmic variable

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Abstract

V1082 Sgr is a cataclysmic variable with an unusually long orbital period of 20.82 h. We reported on the discovery of circular polarization modulated with a period of 1.943 $\pm$ 0.002 h, which is the rotation of a magnetic white dwarf and establish its intermediate polar nature. Therefore, V1082 Sgr is the known IP with the second longest orbital period and with the third longest spin period, which places it as an important case to the understanding of the evolution of magnetic cataclysmic variables. We also modeling the post-shock region of the accretion flow and obtained the magnetic field of 11 MG and a magnetospheric radius consistent with the coupling region at around 2 - 3 white-dwarf radii. The ratio of spin period and orbital period value and the estimated magnetic field momentum suggest that V1082 Sgr could be out of spin equilibrium, in a spin-up state, possibly in a stream accretion mode.