

UNVEILING THE NATURE OF TWO INTERMEDIATE POLARS: V902 MON AND SWIFT J0746.3–1608

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We have carried out detailed time-resolved timing analyses of two long-period intermediate polars (IPs), namely V902 Mon and SWIFT J0746.3-1608, using the long-baseline, high-cadence optical photometric data from the Transiting Exoplanet Survey Satellite (TESS). We refine the orbital and spin periods of V902 Mon and SWIFT J0746.3-1608 as 8.16 ± 0.03 h and 2207.6 ± 0.5 s, and 9.38 ± 0.04 h and 2249.0 ± 0.6 s, respectively. For both sources, we have found the beat period of 2387.0 ± 0.6 s and 2409.5 ± 0.7 s, respectively, which were not evident in earlier studies. For the eclipsing IP V902 Mon, an apparent orbital period derivative of $(6.09 \pm 0.60) \times 10^{-10}$ was also found. Further, the radius of the eclipsed region is estimated to be $\sim 32 R_{\text{WD}}$, indicating the presence of extended emitting regions. Moreover, the second harmonic of orbital frequency dominates the power spectrum of SWIFT J0746.3-1608, suggestive of ellipsoidal modulation of the secondary star. Our analyses in this study hint toward the change in the accretion mode during the entire observing period for both sources and suggest that V902 Mon and SWIFT J0746.3-1608 are most likely to be variable disc-overflow accreting IPs.