Title:	Multi-wavelength study of magnetic cataclysmic variables using astrosat
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Abstract:	Magnetic Cataclysmic Variables (MCVs) are the semi-detached binary systems where the primary White Dwarf (WD) accretes matter from the Roche-lobe filled secondary main sequence star. MCVs can be classified into Polars and Intermediate Polars (IPs) on the basis of magnetic field strength of the WD. MCVs emit over broad wavebands due to the continu- ous interaction between the two components. These systems provide a better understanding of the nature of accretion in the presence of magnetic fields & can be used to understand their evolutionary states. This thesis outlines the multi-wavelength study of three MCVs using AstroSat. These are AR UMa (Polar), QS Tel (Polar), and 1RXS J161935.7+54630 (Polar/Asynchronous Polar). To accomplish our aim, we used AstroSat space observatory for observations in Near UV, Far UV and Soft X-rays. A detailed temporal and spectral analyses was performed for the three MCVs. By observing in both UV and X-ray regimes, we co-relate spectral energy distributions, fluxes, and spectral variations of these systems. AR UMa (AR Ursae Majoris) has the strongest magnetic field found in an accreting Polar. From timing analysis, we found that its orbital period is P Ω = 1.93 hrs, consistent with the literature. The mean AB magnitude was estimated to be 16.18 ± 0.20 in NUV and 15.95 ± 0.28 in FUV region. AR UMa was not detected in soft X-rays and was in its 'faint' state during the observation period. 1RXS J161935.7+524630 (DDE 32), a newly discovered MCV located in the constellation of Draco. It is very first time that the Multi- wavelength study is performed on this system. The orbital period of this MCV was found to be 2.01 hrs. The source was in low accretion state with mean AB magnitudes of 19.27 ± 1.20 and 20.31 ± 0.93 in NUV and FUV regimes respectively and was X-ray silent too. Lastly, we also observed QS Telescopii (QS Tel), a MCV containing 50 − 80 MG White Dwarf, lies in the period gap of CVs having an orbital period of P Ω = 2.32 hrs. We found that this system was in its low state during AstroSat observation with mean AB magnitudes of 17.08 ± 0.17 in NUV and 17.06 ± 0.54 in FUV filters. This was the only source observed in soft X-rays with black-body temperature of 0.09 keV and thermal plasma temperatures of 0.57 & 20.7 keV from post-shock region, for hydrogen column density of 4.38×10 20 cm −2 . The X-ray luminosity of the source was 2.23 × 10 30 ergs s −1 .
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