

A joint SRG/eROSITA + ZTF search: Discovery of two eclipsing cataclysmic variables SRGeJ045359.9+622444 and SRGeJ041130.3+685350

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We report the study and characterization of two new eclipsing CVs (SRGeJ045359.9+622444 (SRGeJ0453) and SRGeJ041130.3+685350 (SRGeJ0411)) discovered from a joint SRG/eROSITA and ZTF program. These objects were identified as CV candidates in a crossmatch of a 1200 deg^2 patch of sky of SRG/eROSITA X-ray data with Gaia proper motion data and the optical ZTF database. SRGeJ0453 and SRGeJ0411 were called to our attention by their proper motion, which was statistically significantly detected by Gaia, the high ratio of X-ray flux to optical flux, and their placement in the Gaia color-magnitude diagram near the white dwarf region. We obtained optical photometry to confirm the eclipse of SRGeJ0453 and SRGeJ0411 and determine the orbital periods to be ≈ 55.1 and ≈ 97.5 minutes, respectively. Optical spectra of these objects show prominent emission lines, typically seen in CVs. Optical spectroscopy suggests that the SRGeJ0453 is a new AM CVn, and the donor star could have initially been a He star or a He white dwarf. The binary parameters of SRGeJ0411 are consistent with evolutionary models for post-period minimum CVs, suggesting that SRGeJ0411 is a new period bouncer. X-ray spectroscopy hints that the white dwarf in SRGeJ0453 and SRGeJ0411 could be magnetic, but verifying the magnetic nature of these systems requires further investigation. The lack of optical outbursts has made SRGeJ0453 and SRGeJ0411 elusive in previous surveys, and joint X-ray and optical surveys highlight the potential for discovering similar systems in the near future.

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