

Non-thermal particles in spectra and light-curves of Sco X-1

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Fast and strongly variable optical emission of accreting neutron star binaries was thought to be originating from the reprocessing of the X-ray emission coming from the central regions in the outer parts of the accretion disc. This picture is supported by the temporal properties, where the optical light-curve is delayed with respect to the X-ray light-curve [2, 4]. However, recent observations [1] show that this scenario is not always realised, and the optical/X-ray cross-correlation function shows a complex structure with the so-called precognition dip (anti-correlation), commonly seen in black hole binary systems [1, 3]. We show that the anti-correlation can be explained in the scenario where optical emission is partially produced by the synchrotron self-Compton mechanism in hybrid plasma [6]. This scenario is supported by the detected non-thermal MeV emission in Sco X-1 [5].

References

- [1] M. Durant et al., *MNRAS*, 410, 2329 (2011)
- [2] S. A. Ilovaisky et al., *MNRAS*, 191, 81 (1980)
- [3] G. Kanbach, C. Straubmeier, H. C. Spruit, T. Belloni, *Nature*, 414, 180 (2001)
- [4] T. Muñoz-Darias et al., *MNRAS*, 379, 1637 (2007)
- [5] M. G. Revnivtsev, S. S. Tsygankov, E. M. Churazov, R. A. Krivonos, *MNRAS*, 445, 1205 (2014)
- [6] A. Veledina, J. Poutanen, I. Vurm, *MNRAS*, 410, 2329 (2011)

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