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Completing the accretion-ejection picture of MAXI J1348-630 from a multiwavelength perspective

MAXI J1348-630 is a black hole X-ray transient discovered in January 2019 that underwent a reflare and several mini-outbursts at the end of its main outburst. In this talk, we present the first multiwavelength study of the system during outburst, reflare and mini-outbursts based on the long-term optical monitoring of the system with the Las Cumbres Observatory (LCO) network. The full optical coverage, including mini-outbursts, represents one of the best-sampled datasets for black hole transients. We show that the outer parts of the accretion disc dominate the optical emission of MAXI J1348-630. In particular, the slope in the spectral energy distributions and the colour-magnitude diagram suggest that the optical emission originates from viscous-thermal processes, with a spectral index of ~ 0.3 . However, the optical/X-ray flux correlation is consistent with both viscous-thermal emission and that expected from an irradiated accretion disc (slope $\sim 0.3-0.4$). We also show that during the decay of the reflare and mini-outbursts, the disc temperature is below 7000 K, which suggests that we are observing the cooling front propagate through the disc. Finally, we show that the radio/optical correlation, one of the first reported for an X-ray binary, is steeper than expected. Since during the reflare and mini-outbursts the source remained in the hard state, these results will help to constrain models of mini-outbursts and failed-transition outbursts.

Contribution

Oral talk

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