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Jet modeling with ISHEM of the BH transient MAXI J1535-571

The multi-wavelength spectral energy distributions of low-mass X-ray binaries (LMXBs) in the hard state are thought to be determined by the emission from a jet (up to mid-infrared frequencies) and the emission from the accretion flow from optical to X-ray up to (possibly) the soft gamma-ray domain. In recent years, the flat radio-to-mid-IR spectra of black hole (BH) X-ray binaries have been described using the internal shocks model. This model assumes that the fluctuations in the velocity of the ejecta along the jet are driven by fluctuations in the accretion flow, as described by the X-ray Power Density Spectrum (PDS).
In this work, we aim to apply an updated version of the internal shocks code for the ejection to a BH LMXB, specifically MAXI J1535-571. We used a multi-wavelength data set obtained in 2017, comprising data from radio to gamma-ray. The old version of the code already allowed for changes in the geometry of the jet, accommodating non-conical jets, and took into account adiabatic cooling. The important change in the new version is the inclusion of the radiative cooling.
We fit the spectral energy distribution (SED) of MAXI J1535 collected in different spectral states. Our results seem to favour a parabolic jet geometry over a conical one, unlike the results for other BHs analyzed previously, but similar to the findings for the only NS examined thus far. Additionally, we investigated the possible contribution of the jet to the gamma-ray emission using data from the SPI instrument onboard INTEGRAL.

Contribution

Oral talk

Affiliation

INAF Palermo

E-mail

carlotta.miceli@inaf.it

Author: Ms MICELI, Carlotta (Istituto Nazionale di Astrofisica (INAF))

Presenter: Ms MICELI, Carlotta (Istituto Nazionale di Astrofisica (INAF))

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