Contribution ID: **45** Type: **Contributed Talk**

Radiation Signatures of Electron Acceleration in the Decelerating Jet of MAXI J1348-630

Thursday 18 September 2025 16:00 (15 minutes)

A discrete jet component (blob) ejection and its subsequent deceleration were observed in the 2019/2020 outburst of the low-mass X-ray binary MAXI J1348–630. A first kinematic analysis of the deceleration due to an abrupt transition from an evacuated cavity to the interstellar medium suggested a kinetic energy exceeding 10^{46} erg, surpassing estimates of the available total ejection energy. However, incorporating a transition layer with exponential density growth between the cavity and the interstellar medium recently enabled a kinematic analysis with much more realistic energy requirements of approximately 10^{44} erg.

Here, we study the expected radiative signatures of electrons accelerated within the decelerating blob by introducing a model akin to the relativistic blast wave model for gamma-ray bursts, considering radiative energy losses and radiation drag, to simulate the deceleration of a relativistically moving plasmoid. This model yields snap-shot spectral energy distributions and multi-wavelength light curves from synchrotron and synchron-self-compton (SSC) emission. Notably, the synchrotron emission peaks in the X-rays, but the predicted X-ray flux is negligible compared to thermal emission from the accretion disk. The predicted radio light curve closely resembles the observed one during the jet decleration phase following the outburst in 2019/2020.

Authors: SARATH, Aishwarya (Universidad Diego Portales); BOETTCHER, Markus

Presenter: SARATH, Aishwarya (Universidad Diego Portales)

Session Classification: X-Ray and Gamma-Ray Binaries

Track Classification: X-Ray and Gamma-Ray Binaries