Contribution ID: **17** Type: **Talk**

X-Ray Spectral Features and Neutrino Production in Blazar 5BZB J0630-2406

Wednesday 26 February 2025 16:03 (18 minutes)

X-ray observations are essential for understanding the emission mechanisms of active galactic nuclei (AGN), particularly blazars, whose X-ray emission predominantly follow a power-law model originating from relativistic jets oriented toward Earth. In this study, we present a detailed analysis of the candidate neutrino-emitting blazar 5BZB J0630-2406, which has been observed over multiple epochs with XMM-*Newton*, *NuSTAR*, *Swift*-XRT, and *eROSITA*. Our findings reveal that 5BZB J0630-2406 exhibits characteristics of an X-ray "changing-look" AGN, a phenomenon more typically associated with Seyfert galaxies. Analysis of the X-ray spectra in the $2.0 - 10.0$ keV band shows significant variability, with high flux states adhering to the expected power-law model indicative of jet emission. However, in low-flux states, the spectrum includes an additional component consistent with corona emission, photoionised absorption, or reflection processes usually observed in obscured AGN. Notably, a spectral break observed during these low states may arise from interactions in the black hole environment, potentially linked to processes producing neutrinos. We tested a range of spectral models to investigate this spectral transition, suggesting that the emission evolves between jet-dominated and multi-component states linked to the central engine of the blazar. The identification of 5BZB J0630-2406 as an X-ray changing-look blazar, combined with its potential for neutrino production, opens new perspectives in multi-messenger astrophysics, underscoring the importance of continued multi-epoch and multi-instrument monitoring to capture the full dynamism of blazars.

Primary authors: TOMBESI, Francesco (Tor Vergata University of Rome); SANCHEZ ZABALLA, Jose Maria (Z_GA (Gammaastronomie)); Prof. BUSON, Sara (University of Wuerzburg); MARCHESI, Stefano (Università di Bologna)

Presenter: SANCHEZ ZABALLA, Jose Maria (Z_GA (Gammaastronomie))

Session Classification: Session 2