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Hadronic processes at work in 5BZB J0630-2406

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Recent observations are shedding light on the important role that active galactic nuclei (AGNs) play in the production of high-energy neutrinos. Despite the growing evidence that blazars are good candidates to be neutrino emitters, our understanding of the physical processes and locations of production remains limited.
In this contribution we present the study of one promising object, 5BZB J0630-2406, which is among the blazars that are associated with neutrino emission (Buson et al., 2022). Modeling its spectral energy distribution (SED), we explore various scenarios from purely leptonic to lepto-hadronic models, testing the inclusion of external photon fields. Our model allows us to derive a neutrino spectrum, which we compare with observations from the IceCube experiment.
These results show that hadronic models predict a detectable neutrino flux, within the reach of the IceCube detector, and compatible with IceCube's observations. As a reprove, the shape of the multi-wavelength SED suggests the presence of sub-dominant processes related to very energetic protons. Furthermore, our modelling indicates that this source displays peculiar physical properties, similar to TXS 0506+056.

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