



Contribution ID: 191

Type: **Parallel Talk**

Propagation of Cosmic Rays in Plasmoids of AGN Jets-Implications for Multimessenger Predictions

Monday, August 8, 2022 3:00 PM (20 minutes)

With the successful detection of cosmic high-energy neutrinos and the first high-probability association of such a neutrino to the blazar TXS 0506+056 leads to the anticipation that active galactic nuclei could soon be identified as point source emitters of high-energy neutrinos. This opens up new challenges for a joint explanation of the observed electromagnetic spectrum together with neutrinos. Modeling the charged, relativistic particles responsible for the different emissions achieves such an explanation.

In this work, we analyze the propagation regimes of cosmic rays, which are crucial constituents, in a relativistic plasmoid traveling along the jet axis. It is shown that in the considered energy range of high-energy photon and neutrino emission, the transition between diffusive and ballistic propagation significantly influences not only the spectral energy distribution but also the lightcurve of blazar flares

Collaboration name

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Session Classification: Neutrinos

Track Classification: Gravitational wave and multimessenger