

Patterns in the multi-wavelength behavior of neutrino emitting blazar candidates

Wednesday 14 April 2021 18:45 (15 minutes)

The detection of the flaring gamma-ray blazar TXS 0506+056 in spatial and temporal coincidence with the high-energy neutrino IC-170922A represents a milestone for multi-messenger astronomy. This finding suggests that gamma rays represent an important tracer of neutrino production in blazars and the 11-year all-sky coverage of the Fermi-LAT provides unique opportunities for both long-term studies of sources as well as realtime follow-up. In this contribution we present an analysis of the temporal and spectral multi-wavelength behavior from radio to GeV gamma rays of blazars found in spatial coincidence with either high-energy neutrino alerts or historical neutrino flares. Our results suggest that high-energy single neutrino emission is correlated with the gamma-ray brightness of the source, which does not hold for neutrino flare-emitting candidates. We also discuss the case of the blazar PKS 1502+106 found in coincidence with the IceCube realtime alert IC-190730A. By numerically simulating cosmic-ray interactions taking place in the jet, we simultaneously explain the source's multi-wavelength signatures and predict the emission of high-energy neutrinos, consistent with the detected IceCube event.

Primary author: GARRAPPA, Simone

Presenter: GARRAPPA, Simone

Session Classification: Exploring Connections: Neutrinos and Gamma Rays

Track Classification: Neutrinos