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Searching correlations between High Energy Neutrinos detected by IceCube and 4LAC Fermi-LAT Sources

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The progenitors of high-energy (HE) neutrinos detected by the IceCube observatory (> 30 TeV) remain on the discussion. Astrophysical events such as Gamma-ray bursts (GRBs), Supernova remnants (SNR), Tidal disruption events, and Active galactic nuclei (AGN) are proposed as HE neutrinos progenitors. So far, the only detection in space-time coincidence with a neutrino event is by the TXS 0506+056 blazar with the neutrino IC 170822A, in whose case, the blazar was observed in flare state at different energy bands. We use ten years of data reported by Fermi-LAT in the 4LAC catalog and search for spatial and temporal correlations between these sources with the track neutrinos detected by IceCube. We propose that photo-hadronic interactions might explain some neutrino events and the spectral energy distribution of those sources.

Primary authors: GALVÁN, Antonio (Institute of Astronomy, UNAM.); Dr FRAIJA, Nissim (Institute of Astronomy, UNAM)

Co-authors: Mr AGUILAR-RUIZ, Edilberto (Institute of Astronomy, UNAM); Dr JOSHI, Jagdish C. (Raman Research Institute); Dr DE DIEGO ONSURBE, José Antonio (Institute of Astronomy, UNAM); Dr MARINELLI, Antonio (INFN-NA)

Presenter: GALVÁN, Antonio (Institute of Astronomy, UNAM.)

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