Contribution ID: **1128** Type: **Talk**

Investigating the neutrino emission of candidate neutrino-emitter blazars with the IceCubePy likelihood framework

Monday 21 July 2025 16:05 (15 minutes)

Active galactic nuclei are promising candidates for astrophysical neutrino sources, as suggested by the detection of a high-energy neutrino positionally consistent with the flaring blazar TXS 0506+056 and evidence of neutrino emission from the nearby Seyfert galaxy NGC 1068. Our recent studies based on the IceCube time-integrated sky maps provided evidence of a statistically significant correlation between blazars and "hotspots" in the neutrino sky as seen by the IceCube Neutrino Observatory. A small subset of blazars, appearing as promising candidate neutrino point sources, has been highlighted. The neutrino emission properties of these blazars remain largely unexplored. The IceCube collaboration has publicly released a 10-year muon-track dataset, but no public analysis tools for analysing these data. In this contribution, we introduce "IceCubePy" , an unbinned maximum likelihood framework designed for the analysis of the public data from the IceCube Neutrino Observatory. We present the analysis performance of IceCubePy, showing that they are largely consistent with those published by the IceCube collaboration. We hence demonstrate that the software is mature and reliable for scientific analyses. Finally, we showcase its first scientific results, applying it to the candidate neutrino-emitter blazars.

Collaboration(s)

Authors: Dr LINCETTO, Massimiliano (University of Würzburg | DESY Zeuthen); Ms BREMER, Annette (Universität Würzburg); SANCHEZ ZABALLA, Jose Maria; BUSON, Sara

Co-authors: ILLUMINATI, Giulia (INFN-Bologna); PFEIFFER, Leonard; PROKHOROV, Dmitry (University of Würzburg); AZZOLLINI, Alessandra; Dr BOUGHELILBA, Margot (DESY Zeuthen)

Presenter: Dr LINCETTO, Massimiliano (University of Würzburg | DESY Zeuthen)

Session Classification: NU

Track Classification: Neutrino Astronomy & Physics