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AMON Searches for Jointly-Emitting Neutrino + Gamma-Ray Transients

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We present the results of archival coincidence analyses between public neutrino data from the 40-string and 59-string configurations of IceCube (IC40 and IC59) with contemporaneous public gamma-ray data from Fermi LAT and Swift. Our analyses have the potential to discover statistically significant coincidences between high-energy neutrinos and gamma-ray signals, and hence, possible jointly-emitting neutrino/gamma-ray transients. This work is an example of more general multimessenger studies that the Astrophysical Multimessenger Observatory Network (AMON) aims to perform. AMON, currently under development at Penn State, will link multiple current and future sensitive high-energy neutrino, cosmic rays and follow-up observatories as well as gravitational wave facilities. This single network enables near real-time coincidence searches for multimessenger astrophysical transients and their electromagnetic counterparts. We will present the component high-energy neutrino and gamma-ray datasets, the statistical approaches that we used, and the results of analyses of the IC40/59+LAT and IC40/59+Swift datasets.

Collaboration

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