Abstract Submitted
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Neutrino Astrophysics and AMEGO ROOPESH OJHA, NASA/GSFC/UMBC — The possible association of the blazar TXS 0506+056 with a high energy neutrino detected by IceCube holds the tantalizing potential to answer three astrophysical questions: 1. Where do high energy neutrinos originate? 2. Where are cosmic rays produced and accelerated? 3. What radiation mechanisms produce the high-energy gamma-rays in blazars? The MeV gamma-ray band holds the key to these questions, because it is an excellent proxy for photo-hadronic processes in blazar jets, which also produce neutrino counterparts. Variability in MeV gamma-rays shed light on the physical conditions and mechanisms that take place in the particle acceleration sites in blazar jets. In addition, hadronic blazar models also predict a high level of polarization fraction in the MeV band, which can unambiguously distinguish the radiation mechanism. Future MeV missions with large field of view, high sensitivity, and polarization capability will guarantee a central role in multi-messenger astronomy, since pointed, high-resolution telescopes will follow neutrino alerts only when triggered by an all-sky instrument.

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