



ID de Contribution: 80

Type: Non spécifié

VHE gamma follow-up programs of HE neutrino alerts

mercredi 29 mars 2023 08:45 (15 minutes)

A decade has passed since high-energy astrophysical neutrinos have been discovered by IceCube, although their progenitors are not yet fully known. The reported coincidence of the high-energy IceCube-170922A with the gamma-ray blazar TXS 0506+056 has not definitively proven that these type of sources are the dominant high-energy neutrino emitters in the Universe.

In fact, IceCube recently announced a second correlation at a nearby Seyfert galaxy, NGC 1068, which is not the same type as the gamma-emitting blazars. The hunt for counterparts of the IceCube neutrinos using gamma-ray telescopes started in 2012.

Nonetheless, these efforts will continue with the next-generation gamma-ray telescopes, such as the CTA Large Size Telescopes (LSTs), by means of an improved and revised observation strategy. These new observations will allow us to detect enough sources in order to elucidate the mystery of the neutrino emitters.

In this contribution, we summarize the efforts made thus far in the search for gamma-ray counterpart of high-energy IceCube events, focusing on alerts made of multiple neutrinos events, and present an idea for improvements in the observational strategies proposed from the gamma-ray telescopes that will become operational in the coming decade.

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Classification de Session: High Energy Astrophysics & Particle Physics

Classification de thématique: High Energy Astrophysics