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High-Fluence Blazars as Possible Sources of the IceCube PeV Neutrinos

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The IceCube collaboration has detected an extraterrestrial neutrino flux with the most significant signal in the southern sky at PeV energies. In spite of its smaller volume, the ANTARES telescope provides comparable sensitivity and superior angular resolution at the given southern declinations and energies below ~ 100 TeV and is thus the ideal instrument to constrain the neutrino spectrum of candidate sources.

We report on an analysis of the spectral energy distributions of a sample of blazars in positional agreement with PeV neutrinos detected by IceCube. Within the framework of the TANAMI program, we showed that the integrated calorimetric output of these blazars is high enough to explain a neutrino fluence in agreement with the observed IceCube events. For the two blazars with the highest predicted neutrino fluence in the fields of the IC14 and IC20 PeV neutrino events, Swift J1656.3-3302 and TXS 1714-336, ANTARES detects two signal-like TeV neutrino events, in agreement both with the blazar-origin hypothesis and with an atmospheric origin. In the absence of any signal-like neutrino events, ANTARES constrains the possible neutrino spectra of four other candidate sources to spectral indices flatter than -2.4 . TANAMI and ANTARES studies of the blazars in the field of the third PeV neutrino event, IC35, are ongoing.

Collaboration

– not specified –

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