

Multi-Messenger observations of the Fermi-LAT blazar 4FGL J0658.6+0636 consistent with an IceCube high-energy neutrino

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The detection of cosmic neutrinos raised many new questions in astroparticle physics, the most important of which is the identification of the neutrino emitters. After more than a decade of IceCube operations, the most promising neutrino astrophysical association remains the very-high-energy (VHE, >100 GeV) blazar TXS 0506+056.

Recently, on November 14, 2020 the IceCube observatory reported the detection of a well-reconstructed high-energy neutrino event, IceCube-201114A, with a high probability of being astrophysical. Within the 90% IC201114A localization region only one known gamma-ray (>100 MeV) source is found. This is 4FGL J0658.6+0636, associated with the active galaxy NVSS J065844+063711.

In this contribution, we will present results from the rich multi-messenger campaign triggered by the IceCube-201114A neutrino detection which has allowed us to collect simultaneous and quasi-simultaneous data for the gamma-ray source potentially associated with the neutrino. We find that NVSS J065844+063711 is a blazar and that its broadband properties resemble those of a high-synchrotron peaked object, making it a promising TeV emitter. Indeed, the detection of VHE photons (> 100 GeV) by the Fermi-LAT provides the first evidence of such emission from this object, making this blazar only the second VHE object found within the 90% confidence region of a well-reconstructed, high-energy IceCube event.

Keywords

blazar; neutrino; IceCube; Fermi-LAT

Collaboration

Fermi-LAT

other Collaboration

VERITAS, H.E.S.S., MAGIC, MWA, TELAMON

Subcategory

Experimental Results

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