



Contribution ID: 11

Type: Oral

Two 100 TeV neutrinos coincident with the Seyfert galaxy NGC 7469

Thursday, 20 June 2024 15:25 (20 minutes)

In 2013, the IceCube collaboration announced the detection of a diffuse high-energy astrophysical neutrino flux. The origin of this flux is still largely unknown. The most significant individual source is the close-by Seyfert galaxy NGC 1068 at 4.2-sigma level with a soft spectral index. To identify sources based on their counterpart, IceCube releases realtime alerts corresponding to neutrinos with a high probability of astrophysical origin. Two neutrino alerts, IC220424A and IC230416A, were spatially coincident with the Seyfert galaxy NGC 7469 at a distance of 70 Mpc. We evaluated, a-posteriori, the chance probability of such a coincidence. To calculate the chance coincidence considering neutrino emission from a specific source population, we performed a Goodness-of-Fit test with a test statistic derived from a likelihood ratio that includes the neutrino angular uncertainty and the source distance. We applied this test first to a catalog of AGN sources and second to a catalog of Seyfert galaxies only. Our a-posteriori evaluation excludes the chance coincidence of the two neutrinos with the Seyfert galaxy NGC 7469 at 3.3-sigma level. Previous non-detection in TeV neutrinos of the source indicate a hard spectral index or a recent onset of the neutrino activity. We discuss the source as a possible neutrino emitter based on its multi-wavelength properties and in comparison to NGC 1068.

Primary author: SOMMANI, Giacomo (Ruhr-Universität Bochum)

Presenter: SOMMANI, Giacomo (Ruhr-Universität Bochum)

Session Classification: Gamma-Ray and Multi-Messenger Astronomy

Track Classification: Galactic and Solar Cosmic Rays