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KM3NeT/ARCA search for the point sources of neutrinos.

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The origin of cosmic ray particles is still largely unknown since they are deflected on their journey to the Earth by magnetic fields. However, very high energy (VHE) photons that can be produced by both leptonic and hadronic processes, are attenuated by extragalactic background light, i.e. they cannot be probed distances larger than z ~ 1 at energies above ~ 1 TeV. In comparison, only hadronic processes can produce an astrophysical neutrino flux which would travel unattenuated and undeflected from the source to the Earth. Thus, astrophysical neutrino observations are crucial to identify CR sources, or to discover distant VHE accelerators. The KM3NeT detector for Astroparticle Research with Cosmics in the Abyss (ARCA), with a cubic kilometer instrumented volume, is currently being built in the Mediterranean Sea. KM3NeT has a view of the sky complementary to IceCube neutrino detector. It serves an excellent pointing resolution (< 0.2◦f or > 10 TeV neutrinos) as well as would be sensitive in a large energy range (GeV - PeV), for the upgoing neutrinos. In this contribution, we present a stacking analysis, that predicts the significance of a global excess of track-like events in KM3NeT data in correlation with a list of point-like sources. Different samples of sources are tested in this analysis: Fermi gamma-ray astrophysical source catalog with a) 1045 BL lac objects and b) 650 radio quasars. We apply a thermal model to study the neutrino production from the mentioned γ-ray source samples. We try to find a correlation between the KM3NeT data and the observed Fermi extragalactic sources.

Session

Astroparticle Physics and Cosmology

Author: MAJUMDAR, Jhilik (Nikhef, Amsterdam)

Presenter: MAJUMDAR, Jhilik (Nikhef, Amsterdam)

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