

All-sky and Galactic Ridge diffuse astrophysical neutrino flux search with KM3NeT/ARCA6-8-19-21 data

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KM3NeT is a European research infrastructure building second-generation neutrino telescopes in the Mediterranean Sea, comprising in its final configuration a network of detectors that will cover more than one cubic kilometre of deep seawater. KM3NeT/ARCA is part of the KM3NeT research infrastructure and focuses on the detection of high energy neutrinos ($> \text{TeV}$) from astrophysical sources. The KM3NeT/ARCA detection units are deployed offshore Capo Passero, Italy at a depth of 3500 m, delivering data as the construction of the detector is ongoing. In this contribution the results of an all-flavour search for diffuse astrophysical neutrino fluxes, using the full dataset obtained with the first KM3NeT/ARCA configurations of appreciable instrumented volume, namely ARCA6 (6 detection units), ARCA8, ARCA19 and ARCA21, will be presented.

Two cases are considered: an all-sky diffuse flux and a flux coming from the Galactic Ridge, namely $|b| < 2^\circ$ and $|| < 30^\circ$, in Galactic coordinates. Recently, strong evidence of a diffuse neutrino emission from the Galactic plane has been reported by the IceCube Collaboration.

However, the angular resolution of the exploited data set allows open questions about the origin of this flux, especially regarding the relative contribution of unresolved sources. KM3NeT detectors are located in the Northern hemisphere, fully complementing the field of view of the IceCube neutrino telescope, and having the possibility to observe the centre of our Galaxy for most of the time with outstanding angular resolution, exploiting track-like upward-going events.

Machine learning techniques for the event selection and a bayesian method for the statistical analysis will be presented.

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