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Analysis of high energy starting events with the KM3NeT/ARCA detector

KM3NeT is a research infrastructure housing the next generation neutrino detectors in the depths of the Mediterranean Sea. The ARCA detector, which is currently under construction, is optimized for searches for neutrinos from astrophysical sources as well as measurements of the diffuse high energy astrophysical flux. The unambiguous detection of neutrinos of extraterrestrial origin by IceCube has led to the first measurement of a high energy astrophysical neutrino flux. The cutting-edge technology used for the design and construction of KM3NeT Digital Optical Modules along with the properties of sea water allow for a measurement of the neutrino direction with an excellent angular resolution for both track and cascade events. Taking advantage of this angular resolution a method to differentiate track and shower events and a method to reject the atmospheric muon background from track-like events were developed and combined to select a sample of high energy starting events. An analysis for the discovery potential of KM3NeT/ARCA for a diffuse astrophysical neutrino flux using these events is presented.

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