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Search for the prompt component in the atmospheric muon flux observed by KM3NeT detectors

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The network of two next-generation underwater Cherenkov neutrino telescopes: ARCA and ORCA is being successively deployed in the Mediterranean Sea by the KM3NeT Collaboration. The focus of ARCA is neutrino astronomy, while ORCA is mainly dedicated to neutrino oscillation studies. Both detectors are already operational in their intermediate states and collect valuable results. This work explores the potential of intermediate as well as complete detector configurations of ARCA and ORCA to observe the prompt component of the atmospheric muon flux, originating from cosmic ray interactions. It builds upon a dedicated reconstruction of observables characteristic for events composed of multiple muons, called muon bundles. The obtained results show that KM3NeT is sensitive to the prompt muon flux component and should be able to verify its existence within the first few years of data taking with completed detectors.

Collaboration(s)

KM3NeT

Author: Dr KALACZYŃSKI, Piotr (AstroCeNT (CAMK PAN), CEAI (AGH))
Presenter: Dr Ó FEARRAIGH, Brían (INFN University of Genoa)
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