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Search for neutrino non-standard interactions with 10 years of ANTARES data and perspectives for KM3NeT/ORCA

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The ANTARES neutrino telescope and its next-generation successor, KM3NeT, located in the abyss of the Mediterranean Sea, have been designed to study neutrinos from a variety of sources over a wide range of energies and baselines. One of the primary goals of the experiments is to determine the Earth matter effects stemming from the energy and zenith angle dependence of the atmospheric neutrinos in the multi-GeV range.

In this talk, I will present the physics potential of ANTARES and KM3NeT/ORCA (ORCA being the low energy sub-array of KM3NeT) detectors to measure sub-dominant effects in the atmospheric neutrino oscillations, namely, neutrino non-standard interactions (NSIs). A likelihood-based search for NSIs with 10 years of atmospheric muon-neutrino data recorded with ANTARES will be reported and sensitivity projections for ORCA, based on realistic detector simulations, will be shown. Remarkably, the limits obtained with ANTARES in the NSI $\mu - \tau$ sector represent the most stringent bounds up to date.

Collaboration name

ANTARES/KM3NeT

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