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## Fishing neutrinos in the Mediterranean sea: In quest for Non-Standard Neutrino Interactions

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The ANTARES neutrino telescope and its next-generation offspring, 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 principal goals of these experiments is to determine Earth-matter effects stemming from the energy and zenith angle dependence of atmospheric neutrinos in the multi-GeV range.

In this contribution, 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, vis-à-vis, Neutrino Non-Standard Interactions (NSIs). The latter in the propagation of neutrinos in matter can lead to significant deviations in neutrino oscillations expected from the standard 3-flavour neutrino oscillation framework. These additional interactions would result in an anomalous flux of neutrinos discernible at neutrino telescopes. A likelihood-based search for NSIs with ten 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. The phenomenological consequences of NSIs on neutrino mass ordering measurements at ORCA will be addressed as well. In addition, the sensitivity of ORCA towards the octant of  $\theta_{23}$  will be outlined. Remarkably, the bounds obtained with ANTARES in the NSI  $\mu - \tau$  sector constitute the most stringent limits till date.

### Session

Neutrino Physics

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