

KM3NeT/Super-ORCA: Measuring the leptonic CP-phase with atmospheric neutrinos —a feasibility study

Studying the atmospheric neutrino oscillation pattern below 2GeV with a multi-megaton Cherenkov detector may allow for a measurement of the leptonic CP-phase. The most relevant CP-sensitive energy range is below the neutrino detection threshold of KM3NeT/ORCA, which is a underwater Cherenkov detector optimised for the neutrino mass hierarchy determination by measuring the oscillation pattern of 3-30GeV atmospheric neutrinos. With KM3NeT/Super-ORCA, a 5 to 10 times more densely instrumented version of ORCA, the detection threshold can be lowered and the event reconstruction capabilities improved. Among the most crucial ingredients for the CP-phase measurement are the flavour identification, energy and direction resolution at low energies.

In this contribution, these key detector performance indicators are estimated for the Super-ORCA detector and a preliminary study to evaluate the potential of Super-ORCA to measure the leptonic CP-phase is presented.

Authorship annotation

for the KM3NeT Collaboration

Session and Location

Wednesday Session, Poster Wall #158 (Ballroom)

Poster included in proceedings:

yes

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Track Classification: Poster (participating in poster prize competition)