

Sensitivity of ORCA to the neutrino mass ordering and oscillation parameters

ORCA (*Oscillations Research with Cosmics in the Abyss*) is a megaton-scale Cherenkov neutrino detector currently under construction by the KM3NeT collaboration, at a depth of 2450m in the Mediterranean Sea. Atmospheric neutrinos cross the Earth along a wide range of baselines, undergoing matter effects which enhance neutrino oscillations in the few GeV energy range with a dependence on the neutrino mass ordering (NMO). The ORCA design consists of a dense configuration of multi-PMT optical modules, exploiting the excellent optical properties of deep seawater to reconstruct both cascade events (mostly ν_e) and track events (mostly ν_μ) down to a few GeV. ORCA is expected to measure the NMO with a median significance greater than 3σ after a few years of operation. This contribution focuses on the methods and results of the sensitivity studies for the measurement of the mass ordering as well as oscillation parameters (θ_{23} , ΔM^2).

Authorship annotation

for the KM3NeT collaboration

Session and Location

Wednesday Session, Poster Wall #161 (Ballroom)

Poster included in proceedings:

yes

Primary authors: Mr QUINN, Liam (CPPM); Mr BOURRET, Simon (APC)

Presenters: Mr QUINN, Liam (CPPM); Mr BOURRET, Simon (APC)

Track Classification: Poster (participating in poster prize competition)