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KM3NeT/ORCA: status and perspectives for measuring the neutrino mass hierarchy and other oscillation parameters (on behalf of the KM3NeT Collaboration)

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ORCA (Oscillations Research with Cosmics in the Abyss) is the low-energy branch of KM3NeT, the next-generation underwater Cherenkov neutrino detector currently in construction in the Mediterranean. The ORCA design foresees a dense configuration of KM3NeT detection units, optimised for studying the oscillations of atmospheric neutrinos and primarily aiming at measuring the neutrino mass hierarchy. The multi-PMT optical modules will exploit the excellent optical properties of deep seawater to accurately reconstruct both cascade (mostly electron neutrinos) and track (mostly muon neutrinos) events with a few GeV of energy. This contribution discusses the potential of the ORCA detector both for the determination of the neutrino mass hierarchy and for obtaining new constraints on other key oscillation parameters such as θ_{23} . New sensitivity studies of exotic oscillation phenomena such as sterile neutrinos and non-standard interactions are also presented, as well as the perspectives for Earth tomography and supernovae detection with ORCA.

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