Contribution ID: **27**   Type: **not specified**

Earth tomography with KM3NeT/ORCA

Monday 21 October 2019 12:30 (30 minutes)

The deep-sea neutrino detector KM3NeT/ORCA, currently being built in the Mediterranean Sea near Toulon (France), is optimized for the study of oscillations of atmospheric neutrinos in the few-GeV energy range, with the main goal to determine the neutrino mass hierarchy. This is possible due to matter effects that modify the probability of neutrino oscillations along their path through the Earth. Measuring the energy and angular distributions of neutrinos with ORCA can therefore also provide tomographic information on the Earth's interior and more specifically on the electron density along the trajectory of the detected neutrino, complementary to standard geophysics methods.

In this contribution the latest results of a study of the potential of ORCA for Earth tomography are presented. They are based on a full Monte Carlo simulation of the detector response and including systematic effects. It is shown that after ten years of operation ORCA can measure the electron density in both the lower mantle and the outer core with a precision of a few percent in the case of normal neutrino mass hierarchy.

Authors: Mr MADERER, Lukas (Lukas); Ms VAN ELEWYCK, Veronique (Universite Paris Diderot); Dr EBERL, Thomas (Erlangen University); BOURRET, Simon (ETH Zurich (CH))

Presenter: Mr MADERER, Lukas (Lukas)