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Neutrino mass hierarchy at large detectors

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We study the possibility to perform neutrino oscillation tomography and to determine the neutrino mass hierarchy in kilometer-scale ice Cerenkov detectors by means of the theta13-driven matter effects which occur during the propagation of atmospheric neutrinos deep through the Earth. We consider the ongoing IceCube/DeepCore neutrino observatory and future planned extensions, such as the PINGU detector, which has a lower energy threshold. Our simulations include the impact of marginalization over the neutrino oscillation parameters and a fully correlated systematic uncertainty on the total number of events.

Auteur principal: Dr PALOMARES-RUIZ, Sergio (IFIC-CSIC / CFTP-IST)

Orateur: Dr PALOMARES-RUIZ, Sergio (IFIC-CSIC / CFTP-IST)

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