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Sensitivity to nu_tau appearance at DeepCore and PINGU

Neutrino oscillations, and in particular the nu_mu disappearance, have been verified several times over and with increasing precision. However to paint a complete picture of neutrino oscillations it is essential to also measure the nu_tau appearance at a very significant level to evaluate the unitarity of the mixing matrix.

The current DeepCore detector, part of the IceCube Neutrino Observatory, that has already been taking data for several years, should have already on tape a high statistics neutrino sample at the energy corresponding to the first maximum of nu_tau appearance. Using the more advanced reconstruction tools that have been put together recently for IceCube/DeepCore we expect to have a good enough event reconstruction to make a statistically significant measurement of nu_tau appearance at 20GeV scale.

In addition to that, the proposed the low energy extension for IceCube/DeepCore, PINGU, would give us an even better potential for measuring nu_tau appearance at its first maxima due to the lower energy threshold and the improvement on the event reconstruction quality from the additional optical modules in the DeepCore volume.

In this poster we discuss both the current status towards this measurement using DeepCore data as well as the potential for such measurement in PINGU.

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