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Determination of the hierarchy and of the octant of θ_{23} with PINGU

This study is being performed in collaboration with E. Lisi (INFN, Bari, Italy) and F. Capozzi (U. of Bari, Italy). The low-energy IceCube extension experiment, PINGU, will allow to probe the neutrino mass hierarchy and the θ_{23} octant. We perform a prospective analysis of PINGU data in a three neutrino oscillation framework, by varying all relevant neutrino oscillation parameters and taking into account the main sources of systematic errors. We also introduce a continuous parameter α , which interpolates between normal hierarchy ($\alpha=+1$) and inverted hierarchy ($\alpha=-1$). We show that with 5 years of data taking, both the hierarchy and the θ_{23} octant can be discriminated at about 3σ .

Summary

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