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## Hierarchy and Octant determination potential of LBNE and LBNO

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Recent measurement of a moderately large value of  $\theta_{13}$  has opened up exciting possibilities for current and future neutrino oscillation experiments, in particular to determine the neutrino mass hierarchy and the octant of  $\theta_{23}$ . Determination of these parameters will provide us with crucial additional inputs to develop a theory of neutrino masses. Current experiments can determine these quantities only for favourable ranges of parameters at limited C.L. Hence, future facilities are mandatory to cover the entire parameter space at discovery level. In this work, we explore the capabilities of LBNE and LBNO, whose large matter effects will enable them to determine the neutrino mass hierarchy and the octant of  $\theta_{23}$ . LBNO has about 10 sigma hierarchy discovery even for the most unfavorable combination of neutrino parameters. The hierarchy reach of LBNE is more limited. In particular, if  $\theta_{23}$  happens to be in the lower octant, then even a 3 sigma discrimination would not be possible for LBNE in its first stage, for the most unfavorable values of  $\delta_{CP}$ . If the current experiments find a hint that the parameter combination is unfavorable, then LBNE should increase their exposure. Regarding the octant, the first stage of LBNO has a 4 sigma discovery potential and that of LBNE has 3 sigma.

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