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Discrimination between Non Standard Interaction and Lorentz Invariance Violation at Protvino to ORCA experiment.

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Several beyond standard model phenomena can affect neutrino oscillation prominently. Two such scenarios are non-standard interaction (NSI) and Lorentz Invariance Violation (LIV). Both phenomena have significant impact on neutrino oscillation. Although both theories emerged quite differently, it is still challenging to discriminate between them. The contributions arising from NSI and LIV to the effective Hamiltonian of neutrino are similar, which make them indistinguishable. NSI affects neutrino oscillation only in the presence of matter, while the effects of LIV can be observable in vacuum as well as in matter. Protvino to ORCA (P2O) is a long baseline experiment with the longest proposed baseline of 2595 km, and it can have a significant matter effect and act as an excellent tool to explore NSI and LIV. In this work, we have studied the effects of NSI and LIV and attempted to distinguish between NSI and LIV at P2O experiment.

Session

Neutrino Physics

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