

Impact of of light sterile neutrino at the long-baseline experiment options at KM3NeT

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We have studied the capability of different long-baseline experiment options at the KM3NeT facility i.e., P2O, Upgraded P2O and P2SO to probe the light sterile neutrino and compare their sensitivities with DUNE. The P2O option will have neutrinos from a 90 KW beam at Protvino to be detected at the ORCA detector, the Upgraded P2O will have neutrinos from the upgraded 450 KW beam to be detected at the ORCA detector and the option P2SO will have neutrinos from a 450 KW beam to be detected at the upgraded Super-ORCA detector. All these options will have a baseline around 2595 km. Our results show that the experiments at the KM3NeT (DUNE) would be more sensitive if the value of Δm_{41}^2 is around 10 (1) eV^2 . Our results also show that the role of near detector is very important for the study of sterile neutrinos and addition of near detector improves the sensitivity as compared to only far detector for 3+1 scenario. Among the three options at KM3NeT, the sensitivity of P2O and upgraded P2O is limited and sensitivity of P2SO is either comparable or better than DUNE.

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