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## Importance of second oscillation maxima in probing invisible neutrino decay

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The constraints on invisible neutrino decay can come from future planned/proposed long baseline experiments - T2HK/T2HKK and ESS $\nu$ SB. The T2HKK and ESS $\nu$ SB experiments are both designed to have energy peak near the second-oscillation maximum of  $P_{\mu e}$  while T2HK has the energy peak at the first oscillation maximum of  $P_{\mu e}$ . We perform a full three flavour study using matter effect and obtain the sensitivity to  $\tau_3/m_3$  for these experiments. In particular, we investigate how the experiments at first and second oscillation maximum fare in presence of neutrino decay. We also study the important factors on which the measurement of  $\theta_{23}$  can depend in presence of decay. We have found that in presence of decay, the overall octant sensitivity is enhanced. This can be attributed to the octant sensitive contribution coming from the disappearance channel ( $P_{\mu\mu}$ ) in presence of decay.

### Collaboration name

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