

Probing sterile neutrino in meson decays with and without sequential neutrino decay

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We present the most systematic approach to discover a sterile neutrino N or constrain $|U_{\ell N}|^2$, the mixing between active neutrino ν_ℓ (with $\ell = \mu, \tau$) and the sterile neutrino N , from $B \rightarrow D\ell N$ decays. Our constraint on $|U_{\mu N}|^2$ achievable from Belle II data is comparable with that from the much larger data set of upgraded LHCb, even much better for mass of sterile neutrino $m_N < 2$ GeV. We can also probe the Dirac and Majorana nature of N by observing the sequential decay of N , including suppression factors associated with observation of a displaced vertex and helicity flip, for Majorana N .

Presenter: LEE, Donghun (Yonsei University)

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