

Impact of non-universal Z' to the $B \rightarrow K\nu\nu$ decays

Tuesday, 25 October 2022 16:20 (15 minutes)

Semileptonic flavor changing neutral current transitions with a pair of neutrinos in the final state are very accurately determined in the standard model (SM) and thus provide an accurate and sensitive probe for physics beyond the SM. Until recently, the poor tagging efficiency for the $B \rightarrow K^{(*)}\nu\bar{\nu}$ modes made them less advantageous as a probe of new physics (NP) compared to the charged lepton counterparts. The most recent Belle II [Dattola:2021cmw] result on $B^+ \rightarrow K^+\nu\bar{\nu}$ indicates a possible enhancement in the branching fraction of $B^+ \rightarrow K^+\nu\bar{\nu}$. Therefore we have explored the possibilities of such an enhancement as a signal of NP within scenario described on [Bednyakov:2021fof] which can also explain some of the other tensions observed in neutral current B-decays. Also we explore sensitivity of these observables to new CP-violating NP contributions at present and planned future B-physics experiments. As such, these observables provide unique probes of CP violation in $b \rightarrow s\nu\bar{\nu}$ transitions.

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Session Classification: Theoretical Physics

Track Classification: Theoretical Physics