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Scrutinizing the effects of new physics in $\Lambda_b \to \Lambda^{(*)}\mu^+\mu^-$ and $\Lambda_b \to \Lambda^{(*)}\nu\bar{\nu}$ baryonic decays

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Due to the loop suppression in the standard model, the flavor changing neutral current transition decays provide an ideal plateform to look for physics beyond the standard model. Latest LHCb measurements on various flavor observables in $b \to s\ell^+\ell^-$ quark level transition decays show significant deviation from the standard model expectations. Similarly, very recently Belle II collaboration has reported an upper bound of $\mathcal{B}(B \to K^+\nu\bar{\nu}) < 4.1 \times 10^{-5}$ in $b \to s\nu\bar{\nu}$ decays. It is well known that $b \to s\ell^+\ell^-$ and $b \to s\nu\bar{\nu}$ decay channels are closely linked in the standard model as well as in beyond the standard model physics under $SU(2)_L$ gauge symmetry. In this context, we perform a combined angular analysis of $\Lambda_b \to \Lambda^{(*)}\mu^+\mu^-$ and $\Lambda_b \to \Lambda^{(*)}\nu\bar{\nu}$ baryonic decay channels. To explore the new physics effects we make use of the standard model effective theory formalism, which provides a model-independent way to describe new physics in terms of operators with higher dimensions. We give predictions of several physical observables pertaining to these baryonic decay channels in the standard model and in case of several new physics scenarios.

Session

Quark and Lepton Flavour Physics

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