



Contribution ID: 72

Type: Poster

Impact of New Physics on $B \rightarrow K_2^*(1430)l_1^+l_2^-$ Decays

Friday 16 December 2022 14:00 (1 hour)

Recent experimental results obtained by the LHCb for the decays through $b \rightarrow s$ transition have depicted the possibility of lepton flavour violation (LFV) indicating the existence of new physics (NP) as the LFV decays are strongly suppressed in the standard model (SM). In the last few years, experiments have obtained the upper limit of the branching fractions to be of the order of 10^{-5} for the decays $B_s^0 \rightarrow l^\pm$ and $B^0 \rightarrow l^\pm$ [1, 2]. This is in stark contrast with the predicted values of the SM for these decays, which is of the order of 10^{-54} [3]. Similar results are obtained for many other LFV decays [4]. These results also indicate signals of new physics in these decay channels. To explore new physics, there are several new physics models to study the LFV decays, like the non-universal Z' model, lepto-quark model, two-Higgs doublet model, etc. In Z' model, NP contributes at tree level by Z' - mediated flavour changing $b \rightarrow s$ and $b \rightarrow d$ transitions. In this work, we intend to investigate the differential branching fractions of LFV decays $B \rightarrow K_2^*(1430)l_1^+l_2^-$ in non-universal Z' model, where l_1 and l_2 denote two leptons of different flavours. The LFV decays $B \rightarrow K^*l_1^-l_2^+$ have already been studied in Z' model [5]. Since K_2^* is higher excited spin-2 state of K^* meson [6], we expect to observe tracks of NP in the $B \rightarrow K_2^*(1430)l_1^+l_2^-$ decay too. We hope that the results which will be obtained from this study may be helpful to the present understanding of the LFV decays.

Acknowledgement

M. Mandal acknowledges DST, Govt. of India for providing the INSPIRE Fellowship (IF200277) during her research.

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Session

Beyond the Standard Model

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Session Classification: Poster - 4