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Delving Υ and ψ leptonic decays with an extra gauge boson

Recently the experimental data attained from the Belle, BABAR, and LHCb experiments, has shown the corporeality of anomalies in the fractions $R(D)$ and $R(D^*)$ coupled with the charged current transition $b \rightarrow c\tau\bar{\nu}_\tau$. Also, we observed that lepton flavor universality can be examined through the ratio of leptonic $\Upsilon = \Upsilon(ns)$ ($n = 1, 2, 3$) and ψ quarkonia decays. We know the Belle informations are in understanding with the standard model (SM) forecasting but the recent world average data are still display a stress. In the BABAR experiment, the neutral current transitions $b\bar{b} \rightarrow \tau\bar{\tau}$ reported that leptonic decay ratio $R_\Upsilon(3s) = Br(\Upsilon(3s) \rightarrow \tau\bar{\tau})/Br(\Upsilon(3s) \rightarrow \mu\bar{\mu})$ is showing an agreement with the SM at 1.8σ level, where the ratio $R(J/\psi)$ expose discrepancies with resembling SM estimations. We perform an analysis by using a clarify model with extra massive gauge bosons that catenate substantially to left handed leptons of the third generation. We show that $R_\Upsilon(3s)$ and $R(J/\psi)$ cannot be assuredly accommodated together with $b \rightarrow c\tau\bar{\nu}_\tau$ data, which tantalizing hints of new anomalous observable.

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