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The lepton flavor universality violation in Υ and B meson decays and the W' -triplet boson model

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In recent years, evidence of Lepton Flavour Universality Violation has been observed in semi-leptonic decays associated with the charged-current transition $\bar{u} \rightarrow \bar{d} \ell^+ \ell^-$ by BABAR, Belle and LHCb experiments, up to 3 standard deviations (3σ). While for the neutral-current transition $\bar{u} \rightarrow \bar{u} \ell^+ \ell^-$, the BABAR collaboration in 2020 reported a discrepancy of 1.8σ in the leptonic decay of the $\Upsilon(3s)$ meson. Since the new physics operator that modifies the charged transition also contributes to the neutral process, in this work we study the impact of these measurements on a new physics model consisting of an extra triplet of left-handed vector-bosons (W' , Z') that coupled preferably to fermions of the third family. We observe that this model cannot simultaneously explain the recent measurement obtained by BABAR for $\Upsilon(3s)$ and the observables given by the transition $\bar{u} \rightarrow \bar{d} \ell^+ \ell^-$.

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