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New physics analysis of some b-baryon decays

Measurements in the $b \to c\tau^- \overline{\nu}_{\tau}$ transitions suggest violation of lepton flavor universality. Assuming the flavor anomalies are due to new physics (NP) beyond the Standard Model (SM), we analyse the semileptonic decays of some heavy *b*-baryons to *c*-baryons, $B_b \to B_c \tau^- \overline{\nu}_{\tau}$, which are mediated by $b \to c\tau^- \overline{\nu}_{\tau}$ transitions. Using a general effective Hamiltonian which includes both SM and NP contributions, we study and discuss the effects of the new contributions on the semileptonic q^2 spectra, such as the differential branching fraction, ratio of branching fractions and forward-backward asymmetry of the charged lepton in various new physics scenarios.

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