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Implications of new physics in semileptonic $b \to cl\bar{\nu}_l$ transitions.

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Several indications of lepton non-universality observables have been perceived in semileptonic B meson decay processes, both in the neutral-current ($b \to sll$) and charged-current ($b \to cl\bar{\nu}_l$) transitions, recently. Influenced by these fascinating quotients, we examine the semileptonic decays involving the $b \to cl\bar{\nu}_l$ quark level transitions. We execute it through a model-independent analysis in order to probe the nature of new physics. Taking into consideration the most general effective Hamiltonian, we scrutinize $\Lambda_b \to \Lambda_c \tau \bar{\nu}_\tau$, $B_c^+ \to \eta_c \tau^+ \nu_\tau$, and $B \to D^{**} \tau \bar{\nu}_\tau$ (where $D^{**} = \{D_0^*, D_1^*, D_1, D_2^*\}$ are the four lightest excited charm mesons) processes, in the presence of new physics. We perform a global fit to different sets of new coefficients, making use of the measurements on R_D, R_{D^*}, $R_{J/\psi}$, $P_\tau^{D^*}$ and the upper limit on Br($B_c^+ \to \tau^+ \nu_\tau$). We then inspect the effect of constrained new couplings on the branching ratios, forward-backward asymmetry parameters, lepton non-universality ratios (LNU), and lepton and hadron polarization asymmetries of these decay modes.

Session

Quark and Lepton Flavour Physics

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