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Analysis of $B_c \rightarrow D^{(*)} \tau \bar{\nu}_\tau$ processes

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We present a compressive study on rare semileptonic $B_c \rightarrow D^{(*)} \tau \bar{\nu}_\tau$ decays involving $b \rightarrow u \tau \bar{\nu}_\tau$ quark level transitions in an effective field theory approach. We consider the presence of an additional (pseudo)vector and (pseudo)scalar type interactions which can be either complex or real and constrain the new couplings using the existing data on $R_{D^{(*)}}$, $R_{J/\psi}$, R_π^l , $\text{Br}(B_{u,c} \rightarrow \tau \bar{\nu}_\tau)$ and $\text{Br}(B \rightarrow \pi \tau \bar{\nu}_\tau)$ parameters. In order to segregate the sensitivity of new coefficients, we check the effects of these couplings on the branching ratios, lepton non-universality and various angular observables of $B_c \rightarrow D^{(*)} \tau \bar{\nu}_\tau$ processes.

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