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## Effect of light right-handed neutrinos on $\Upsilon(1S) \rightarrow B_{(c)}\tau\bar{\nu}_\tau$ decay mode in the effective field theory framework

Driven by the persistent anomalies observed in the  $b \rightarrow (u, c)\tau\bar{\nu}_\tau$  decays, we investigate these transitions within the framework of effective field theory, incorporating possible contributions from light right-handed neutrinos. By performing a global fit to the available experimental data, including measurements of  $R_{D^{(*)}}$ ,  $R_{J/\psi}$ ,  $R_\pi$ ,  $P_\tau^{D^*}$  the branching ratio for  $B_c \rightarrow \tau\bar{\nu}_\tau$ , and  $B \rightarrow \pi\tau\bar{\nu}_\tau$ , we determine the allowed ranges for the Wilson coefficients associated with various new physics scenarios. We then explore the impact of the constrained new parameters, specifically those arising from light right-handed neutrinos, on the semileptonic decay  $\Upsilon(1S) \rightarrow B_{(c)}\tau\bar{\nu}_\tau$ . Furthermore, we examine the existence of lepton non-universality in these decay modes.

### Field of contribution

Phenomenology

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