



Contribution ID: 24

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Sensitivity to scalar contributions in b to c (u) τ ν decays

Thursday, July 6, 2017 5:30 PM (15 minutes)

I present results of an analysis of scalar contributions in $b \rightarrow c \tau \nu$ transitions including the latest measurements of $R(D^{(*)})$, the q^2 differential distributions in $B \rightarrow D^{(*)} \tau \nu$, the τ polarization asymmetry for $B \rightarrow D^{(*)} \tau \nu$, and the bound derived from the total width of the B_c meson. Scalar contributions with the simultaneous presence of both left- and right-handed couplings to quarks can explain the available data, specifically $R(D^{(*)})$ together with the measured differential distributions. However, the constraints from the total B_c width present a slight tension with the current data on $B \rightarrow D^{(*)} \tau \nu$ in this scenario, preferring smaller values for $R(D^{(*)})$. I discuss possibilities to disentangle scalar new physics from other new-physics scenarios like the presence of only a left-handed vector current, via additional observables in $B \rightarrow D^{(*)} \tau \nu$ decays or additional decay modes like the baryonic $\Lambda_b \rightarrow \Lambda c \tau \nu$ and the inclusive $B \rightarrow X c \tau \nu$ decays. We also analyze scalar contributions in $b \rightarrow u \tau \nu$ transitions, including the latest measurements of $B \rightarrow \tau \nu$, providing predictions for $\Lambda_b \rightarrow p \tau \nu$ and $B \rightarrow \pi \tau \nu$ decays. The potential complementarity between the $b \rightarrow u$ and $b \rightarrow c$ sectors is finally investigated once assumptions about the flavour structure of the underlying theory are made.

Experimental Collaboration

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