



Contribution ID: 14

Type: Poster

Correlating Tauonic B Decays to the Neutron EDM via a Scalar Leptoquark

Tuesday 22 October 2019 17:51 (1 minute)

We investigate the correlations between tauonic B meson decays (e.g. $B \rightarrow \tau \nu$, $B \rightarrow D^{(*)} \tau \nu$, $B \rightarrow \pi \tau \nu$) and electric dipole moments (EDMs), in particular the one of the neutron, in the context of the S1 scalar leptoquark (LQ). This LQ naturally arises in the R-parity violating MSSM as the right-handed down-squark. We perform the matching of this model on the effective field theory taking into account the leading renormalization group effect for the relevant observables. We find that one can explain the hints for new physics in $b \rightarrow c \tau \nu$ transitions without violating bounds from other observables. Even more interesting, it can also give sizable effects in $B \rightarrow \tau \nu$, to be tested at BELLE II, which are correlated to (chromo) electric dipole operators receiving m_τ/m_μ enhanced contributions. Therefore, given a deviation from the Standard Model (SM) expectations in $B \rightarrow \tau \nu$, this model predicts a sizable neutron EDM. In fact, even if new physics has CP conserving real couplings, the CKM matrix induces a complex phase and already a 10% change of the $B \rightarrow \tau \nu$ branching ratio (with respect to the SM) will lead to an effect observable with the n2EDM experiment at PSI.

Author: CRIVELLIN, Andreas (PSI&UZH)

Presenter: CRIVELLIN, Andreas (PSI&UZH)

Session Classification: BBQ - Drinks & Posters