Contribution ID: **23** Type: **Regular Talk (15'+5')**

Addressing the B meson anomalies within the minimal U_1 leptoquark model

Friday 2 December 2022 09:45 (20 minutes)

Very recently the LHCb experiment released the first measurement of the ratio $R(\Lambda_c)$. Moreover, the BABAR experiment reported a new result of the leptonic decay ratio of Upsilon meson $\Upsilon(3S)$, namely, $R_{\Upsilon(3S)}$. Both measurements are below their corresponding Standard Model predictions (deficit), deviating by \sim 1.1\sigma~1.1σ and \sim 1.8\sigma~1.8σ, respectively. In addition, the LHCb recently presented the first search of the LFV decay $B^0 \to K^{*0}\mu^{\pm}\tau^{\mp}$. Motivated by these new data, in this work we study their impact on the phenomenology of the singlet vector leptoquark (U_1) model addressing the hints of lepton flavor universality violation in the semileptonic decays of BB mesons (BB meson anomalies), by carrying out a global fit analysis. In general, we found that a minimal version of the U_1 model with a mass of 1.8 TeV can successfully explain the BB meson anomalies, while being compatible with all other flavor observables and LHC bounds. Interestingly, our study shows that the new observables generate strong tension, leading to non-trivial effects on the global fit. Future improvements at the LHCb and Belle II experiments would help to understand their complementarity. Moreover, we also analyze the impact of the expected sensitivity on flavor observables at Belle II to provide a further test of the U_1 model. Finally, we study the minimal assumptions under which the U_1model could, in addition, provide a combined explanation of the anomalous magnetic moment of the muon.

Authors: QUINTERO POVEDA, Nestor (Universidad Santiago de Cali); CABARCAS, Miguel (Universidad Santo Tomás); MUÑOZ, José Herman (Universidad del Tolima); ROJAS, Eduardo

Presenter: QUINTERO POVEDA, Nestor (Universidad Santiago de Cali)

Session Classification: QCD and Heavy Flavours

Track Classification: Theory - Phenomenology