



Contribution ID: 394

Type: **not specified**

Flavor anomalies, Dark matter with vector-like fermions and scalar leptoquark

Thursday 26 August 2021 17:00 (20 minutes)

We make a comprehensive study of vector-like fermionic dark matter and flavor anomalies in a simple extension of standard model. The model is added with doublet vector-like fermions of quark and lepton type, and also a $S_1(\bar{3}, \mathbf{1}, 1/3)$ scalar leptoquark. An additional lepton type singlet fermion is included, whose admixture with vector-like lepton doublet plays the role of dark matter and is examined in relic density and direct detection perspective. Electroweak precision observables are computed to put constraint on model parameter space. We constrain the new couplings from the branching ratio and angular observables associated with $b \rightarrow sll(\nu_l \bar{\nu}_l)$, $b \rightarrow s\gamma$ decays. We then estimate the branching ratios of the rare lepton flavor violating τ decays such as $\tau \rightarrow \mu(\gamma, \phi, \eta, \eta')$. We also investigate the muon anomalous magnetic moment.

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Session Classification: Dark Matter and Astroparticle Physics

Track Classification: Dark Matter and Astroparticle Physics