



Contribution ID: 571

Type: Parallel talk

}Generic Loop Effects of New Scalars and Fermions in $b \rightarrow s\ell^+\ell^-$ and a Vector-like 4th Generation

Saturday 13 July 2019 11:40 (20 minutes)

We investigate the possibility of accounting for the $b \rightarrow s\ell^+\ell^-$ anomalies via box contributions involving with new scalars and fermions. For this purpose we extend previous analysis by allowing that the new particles can also couple to right-handed Standard Model (SM) fermions as preferred by recent $b \rightarrow s\ell^+\ell^-$ data and the anomalous magnetic moment of the muon.

In the second part of the talk we illustrate this generic approach for a UV complete model in which we supplement the Standard Model by a 4th generation of vector-like fermions and a real scalar field. This model allows one to coherently address the observed anomalies in $b \rightarrow s\ell^+\ell^-$ transitions and in a_μ without violating the bounds from other observables (in particular $B_s - \bar{B}_s$ mixing) or LHC searches. In fact, we find that our global fit to this model, after the recent experimental updates, is very good and prefers couplings to right-handed SM fermions.

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Session Classification: Flavour Physics and CP Violation

Track Classification: Flavour Physics and CP Violation