

Gluino-mediated electroweak penguin with flavor-violating trilinear couplings

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In light of a discrepancy of the direct CP violation in $K \rightarrow \pi\pi$ decays, ϵ'/ϵ_K , we investigate gluino contributions to the electroweak penguin, where flavor violations are induced by squark trilinear couplings. Top-Yukawa contributions to $\Delta S=2$ observables are taken into account, and vacuum stability conditions are evaluated in detail. It is found that this scenario can explain the discrepancy of ϵ'/ϵ_K for the squark mass smaller than 5.6 TeV. We also show that the gluino contributions can amplify $\text{Br}(K \rightarrow \pi\nu\bar{\nu})$, $\text{Br}(K_S \rightarrow \mu^+ \mu^-)$ and $\Delta A_{\text{CP}}(b \rightarrow s\gamma)$. Such large effects could be measured in future experiments.

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