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# Epsilonprime and K to pi neutrino antineutrino correlations and new physics

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Recent calculations have pointed to a 2.8 $\sigma$ tension between data on $\epsilon'$ and the SM prediction. Several new physics (NP) models can explain this discrepancy. It is known that such NP models are likely to predict deviations of the kaon rare decay branching ratios from the SM predictions, especially $B(K \to \pi\nu\bar{\nu})$ which can be probed well precisely in near future. We investigate a correlation between $\epsilon'$ and $B(K \to \pi\nu\bar{\nu})$ in two type NP scenarios: $Z$-penguin dominated scenario and the Trojan penguin dominated scenario. In the $Z$-penguin dominated scenario, we point out that interference effects between the SM and NP contributions to $\Delta$ S = 2 observables are overlooked in the literature, and it is found that they make experimental bounds significantly severer. On the other hand, in the Trojan penguin dominated scenario based on supersymmetry, different correlations are shown. This talk is based on arXiv:1604.07400, arXiv:1612.08839 and arXiv:1703.*.

## Summary

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