

Up Sector of Minimal Flavor Violation: Top Quark Properties and Direct D meson CP violation

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Minimal Flavor Violation in the up-type quark sector leads to particularly interesting phenomenology due to the interplay of flavor physics in the charm sector and collider physics from flavor changing processes in the top sector. We study the most general operators that can affect top quark properties and D meson decays in this scenario, concentrating on two CP violating operators for detailed studies. The consequences of these effective operators on charm and top flavor changing processes are generically small, but can be enhanced if there exists a light flavor mediator that is a Standard Model gauge singlet scalar and transforms under the flavor symmetry group. This flavor mediator can satisfy the current experimental bounds with a mass as low as tens of GeV and explain observed D -meson direct CP violation. Additionally, the model predicts a non-trivial branching fraction for a top quark decay that would mimic a dijet resonance.

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