

Flavor Physics in an SO(10) Grand Unified Model

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In a supersymmetric grand-unified model proposed by Chang, Masiero and Murayama the atmospheric neutrino mixing angle induces large new $b \rightarrow s$ transitions. Relating the supersymmetric low-energy parameters to seven new parameters a_0 , m_0^2 , $m_{\tilde{g}}$, D , ξ , $\tan(\beta)$ and $\arg(\mu)$ of this SO(10) GUT model, we perform a correlated study of several FCNC processes. The LEP limit on the lightest Higgs boson mass implies an important lower bound on $\tan(\beta)$, which in turn limits the size of the new FCNC transitions. Remarkably, the combined analysis does not rule out large effects in B_s - \bar{B}_s mixing and we can easily accommodate the large CP phase in the B_s - \bar{B}_s system which has recently been inferred from a global analysis of CDF and D0 data. The model predicts a particle spectrum which is different from the popular CMSSM. BR($\tau \rightarrow \mu \gamma$) enforces heavy masses, typically above 1 TeV, for the sfermions of the degenerate first two generations. However, the ratio of the third-generation and first-generation sfermion masses is smaller than in the CMSSM and a (dominantly right-handed) stop with mass below 500 GeV is possible.

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