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Flavour issues for a heavy scalar spectra with a low gluino mass: the G2-MSSM case

In recent years it has been learned that scalar superpartner masses and trilinear couplings are generically larger than about 20 TeV at the short distance string scale if our world is described by a compactified string or M-theory with supersymmetry breaking and stabilized moduli. Here we study implications of this, for a particular realization (compactification of M-theory on a G2 manifold) where there is a good knowledge of the superpotential, the gauge kinetic function, and a light gluino.

Flavour violation stems from off-diagonal and non-universal diagonal elements of scalar mass matrices and trilinear couplings, and from renormalization group running. We also examine stability bounds on the scalar potential. While heavy scalars alone do not guarantee the absence of flavour problems because results depend on the Yukawa and trilinear couplings, our studies show that models with heavy scalars and light gluinos can be free from flavour problems.

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