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Flavour physics, supersymmetry and GUTs

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The 2010 data on quark flavour physics reveal a considerable tension with the Standard Model. However, an excellent fit is found if one permits new physics in the amplitudes describing meson-antimeson mixing in the B_d and B_s systems. The corresponding global analysis disfavours the Standard Model at the level of 3.6 standard deviations and calls for new sources of CP violation in the B-Bbar mixing amplitudes. An interpretation within the Minimal Supersymmetric Standard Model (MSSM) must go beyond the popular assumption of Minimal Flavour Violation (MFV). Grand unified theories can provide additional sources of quark flavour violation which are governed by the lepton mixing matrix. I present the results of a global analysis of an SO(10) GUT model, which accommodates a large CP phase in B_s - B_s-bar mixing while being consistent with other constraints. I discuss the correlations between quark and lepton flavour physics and the sparticle spectrum which arise from the GUT boundary conditions.

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