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Third Family Quark-Lepton Unification at the TeV Scale

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We construct a model of quark-lepton unification at the TeV scale based on an SU(4) gauge symmetry, while still having acceptable neutrino masses and enough suppression in flavor changing neutral currents. An approximate U(2) flavor symmetry is an artifact of family-dependent gauge charges leading to a natural realization of the CKM mixing matrix. The model predicts sizeable violation of PMNS unitarity as well as a gauge vector leptoquark U1 = (3,1,2/3) which can be produced at the LHC – both effects within the reach of future measurements. In addition, recently reported experimental anomalies in semi-leptonic B-meson decays, both in charged b->ctv and neutral b->sµµ currents, can be accommodated.

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