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A Realistic U(2) Model of Flavor

Wednesday 4 July 2018 16:00 (30 minutes)

I will discuss a simple $U(2)$ flavor model compatible with an $SU(5)$ GUT structure. All hierarchies in fermion masses and mixings arise from powers of two small parameters that control the $U(2)$ breaking pattern. In contrast to previous $U(2)$ models this setup can be realized without supersymmetry and provide an excellent fit to all SM flavor observables including neutrinos, thus predicting an upper bound on the neutrino mass scale below current cosmological bounds. A variant of this model is based on a $D_6 \times U(1)_F$ flavor symmetry, which closely resembles the $U(2)$ structure, but allows for Majorana neutrino masses from the Weinberg operator. Remarkably, in this case the structure of neutrino masses is closely tied to the quark sector, and one naturally obtains large mixing in the lepton sector from small mixing in the quark sector. Finally the model offers a natural option for adressing the Strong CP Problem and Dark Matter by identifying the Goldstone boson of the $U(1)_F$ factor as the QCD axion.

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