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Flavor from the double tetrahedral group without supersymmetry: flavorful axions and neutrinos

We extend the work of Carone, Chaurasia and Vasquez on non-supersymmetric models of flavor based on the double tetrahedral group. Three issues are addressed: (1) the sector of flavorsymmetry-breaking fields is simplified and their potential studied explicitly, (2) a flavorful axion is introduced to solve the strong CP problem and (3) the model is extended to include the neutrino sector. We show how the model can accommodate the strong hierarchies manifest in the charged fermion Yukawa matrices, while predicting a qualitatively different form for the light neutrino mass matrix that is consistent with observed neutrino mass squared differences and mixing angles

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