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Fitting neutrino masses in a realistic intersecting D-braneworld
VAN MAYES, EVAN HOWINGTON, JORDAN GEMMILL, University of Houston, Clear Lake — The correct quark and charged lepton mass matrices along with a nearly correct CKM matrix may be naturally accommodated in a Pati-Salam model constructed from intersecting D6 branes on a $T^6/(Z_2 \times Z_2)$ orientifold. Also, near-tribimaximal mixing for neutrinos may arise naturally due to the structure of the Yukawa matrices. Consistency with the quark and charged lepton mass matrices in combination with obtaining near-tribimaximal mixing fixes the Dirac neutrino mass matrix completely. Then, applying the seesaw mechanism for different choices of right-handed neutrino masses and running the obtained neutrino parameters down to the electroweak scale via the RGEs, we are able to make predictions for the neutrino masses and mixing angles. We obtain lepton mixing angles which are close to the observed values, $\theta_{12} = 33.8^\circ \pm 1.2^\circ$, $\theta_{23} = 46.9^\circ \pm 0.9^\circ$, and $\theta_{13} = 8.56^\circ \pm 0.20^\circ$. In addition, the neutrino mass-squared differences are found to be $\Delta m^2_{32} = 0.0025 \pm 0.0001$ eV^2 and $\Delta m^2_{21} = 0.000075 \pm 0.000003$ eV with $m_1 = 0.0150 \pm 0.0002$ eV, $m_2 = 0.0173 \pm 0.0002$ eV, and $m_3 = 0.053 \pm 0.002$ eV so that $\sum_i m_i = 0.085 \pm 0.002$ eV, consistent with experimental observations.

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