

Study of a neutrino mass texture generated in supergravity with bilinear R-parity violation

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Abstract

We study a particular texture of the neutrino mass matrix generated in supergravity with non-universal bilinear R-parity violation parameters. The relatively high value of $\tan\beta$ makes the one-loop contribution to the neutrino mass matrix as important as the tree-level one. The atmospheric angle is nearly maximal, and its deviation from maximal mixing is related to the small size of the ratio between the solar and atmospheric mass scales. There is also a common origin for the small values of the solar and reactor angles, but the latter is much smaller due the large mass ratio between the heaviest two neutrinos. There is a high dependence of the neutrino mass differences on the scalar mass m_0 and the gaugino mass $M_{1/2}$, but a smaller dependence of the mixing angles on the same SUGRA parameters. Measurements of branching ratios for the neutralino decays can give important information on the parameters of the model. There are good prospects at a future linear collider for these measurements, but a more detailed analysis is necessary for the LHC.