

Peccei-Quinn Symmetry and Nucleon Decay in Renormalizable SUSY $\mathbb{Z}(10)$

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Simple ways of implementing Peccei-Quinn (PQ) symmetry to solve the strong CP problem in renormalizable SUSYSO(10) models with a minimal Yukawa sector is suggested. Realistic fermion mass generation requires that a second pair of Higgs doublets survive down to the PQ-scale. How unification of gauge couplings can be achieved in this context is demonstrated. Higgsino mediated proton decay rate is strongly suppressed by a factor of $(M_{PQ}/M_{GUT})^2$, which enables all SUSY particles to have masses of order TeV. With TeV scale SUSY spectrum, $p \rightarrow \nu K^+$ decay rate is expected to be in the observable range. Lepton flavor violating processes $\mu \rightarrow e\gamma$ decay and $\mu - e$ conversion in nuclei, induced by the Dirac neutrino Yukawa couplings, are found to be within reach of forthcoming experiments.

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