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Minimal Non-Supersymmetric Unified $SO(10)$ Model

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We present the minimal non-supersymmetric Grand Unified $SO(10)$ Model, which is compatible with all the phenomenological constraints. The Higgs sector, containing a real 54-plet, a complex 126-plet and a complex 10-plet breaks the symmetry to Standard Model via Pati-Salam symmetry with D-parity at an intermediate scale consistent with current neutrino data. Threshold correction introduced by the scalar mass spectra pushes the unification scale high enough to accommodate proton lifetime beyond current experimental limit. The model has a Yukawa sector which is compatible with fermion masses-mixing and leptogensis. Enlarging the symmetry to $SO(10) \times U(1)_{PQ}$, we can simultaneously address the strong CP problem and stability of the electroweak vacuum while Axion of the theory becomes Dark matter candidate. Sample points in the parameter space has been produced which can explain all the physics below GUT scale.

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