

Anatomy of scalar mediated proton decays in $SO(10)$ models

Any grand unified model is plagued with particles capable of inducing proton decay. Identifying all potential scalar proton decay mediators stemming from different irreducible representations of $SO(10)$, we will show their coupling with the Standard Model fermions, tree-level contributions of the effective strength of $B - L$ conserving($d = 6$), and $B - L$ violating($d = 7$) operators to proton decay width expression. Through the computed branching ratio of various decay modes of proton in a realistic $SO(10)$ model based on 10_H and $\overline{126}_H$, we will enumerate distinct features of scalar mediated proton decay including bound on the mass of the proton decay mediators.

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