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Recent Progress in SUSY GUTs

Saturday 24 July 2010 09:00 (15 minutes)

I will summarize recent developments in 4-dimensional supersymmetric grand unified model building. A class of SUSY GUTs based on $SO(10)$ will be presented which successfully addresses for the first time (i) the doublet-triplet splitting problem to all orders, (ii) realistic quark and lepton mixing, (iii) gauge coupling unification including GUT scale threshold effects, and (iv) the origin of the μ term. Expectations for proton lifetime in these models will be discussed, which shows an interesting correlation between the $e^+ \pi^0$ mode and the $\bar{\nu}_\mu K^+$ mode. An improvement in the experimental sensitivity by about a factor of ten should reveal proton decay in both these channels, with the lifetime for $p \rightarrow e^+ \pi^0$ predicted to be below a few times 10^{34} years.

This work is primarily based on the paper "Constraining Proton Lifetime in $SO(10)$ with Stabilized Doublet-Triplet Splitting", by K.S. Babu, Jogesh C. Pati and Zurab Tavartkiladze, arXiv:1003.2625v2 [hep-ph].

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