

Phenomenology 2021 Symposium



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Minimal $SU(5)$ Unification

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A minimal model of $SU(5)$ Grand Unification is proposed. The model is entirely built out of the first five lowest dimensional $SU(5)$ representations. Charged and neutral fermion mass generation mechanisms are non-trivially linked together. The main predictions of the model are that (i) the neutrinos are Majorana particles, (ii) one neutrino is massless, (iii) the neutrinos have normal mass ordering, and (iv) there are four new scalar multiplets at or below a 120 TeV mass scale. An improvement of the current $p \rightarrow \pi^0 e^+$ lifetime limit by a factor of 2, 15, and 96 would require these four scalar multiplets to reside at or below the 100 TeV, 10 TeV, and 1 TeV mass scales, respectively.

Summary

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