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A Minimal Supersymmetric SU(5) Missing-Partner Model

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We explore a missing-partner model based on the minimal SU(5) gauge group with 75, 50 and 50 Higgs representations, assuming a super-GUT CMSSM scenario in which soft supersymmetry-breaking parameters are universal at some high scale above the GUT scale. We identify regions of parameter space that are consistent with the cosmological dark matter density, the measured Higgs mass and the experimental lower limit on proton lifetime. These constraints can be satisfied simultaneously along stop coannihilation strips. We find that the lifetime of the proton decay into K^+ and neutrino is less than 3×10^{34} years throughout the allowed range of parameter space, within the range of the next generation of searches with the JUNO, DUNE and Hyper-Kamiokande experiments.

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