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Phenomenology of non-universal gaugino masses and implications for the Higgs boson decays

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We study the implications of non-universal boundary conditions for the composition of the lightest neutralino as well as for the upper bound on its mass in supersymmetric grand unified theories. We derive sum rules for neutralino and chargino masses in different representations of the simplest grand unified theory based on SU(5) which lead to different non-universal boundary conditions for the gaugino masses at the unification scale. We then consider implications of the non-universal gaugino masses, that arise in such a grand unified theory, for the phenomenology of Higgs bosons. In particular we investigate the detection of heavy neutral Higgs bosons H0, A0 in the decay H0, A0 -> Chi2^0 Chi2^0 to 4l. We also study the possibility of detecting the neutral Higgs bosons in cascade decays Chi2^0 -> h0 (H0, A0) Chi1^0 -> b bbar Chi1^0.

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