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Non universal gaugino mass models vis-a-vis LHC and Dark Matter

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We perform a comprehensive study of SU(5), SO(10) and E(6) supersymmetric GUT models where the gaugino masses are generated through the F-term breaking vacuum expectation values of the non-singlet scalar fields. In these models the gauginos are non-universal at the GUT scale unlike in the mSUGRA scenario. We discuss the properties of the LSP which is stable and a viable candidate for cold dark matter. We look for the GUT scale parameter space that leads to the the lightest SM like Higgs mass in the range of 122-127 GeV compatible with the observations at ATLAS and CMS , the relic density in the allowed range of WMAP-PLANCK and compatible with other constraints from colliders and direct detection experiments. We scan universal scalar m_0, trilinear coupling A_0 and SU(3)_C gaugino mass M_3 as the independent free parameters for these models. Based on the gaugino mass ratios at the GUT scale, we classify 25 SUSY GUT models and find that of these only 13 models satisfy the dark matter and collider constraints. Out of these 13 models there is only one model where there is a sizeable SUSY contribution to muon (g-2).

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