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A Light Singlet in Gauge Mediation

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I will discuss the possibility of a light supersymmetric singlet below 100 GeV in the context of a very predictive model that combines the NMSSM and Gauge Mediation. This model has been originally proposed by Delgado, Giudice and Slavich, but the LEP bound had been imposed on the lightest Higgs state. We re-analyzed this model and found new interesting regions in the parameter space with a light singlet state that mixes with the SM-like Higgs at 125 GeV. This mixing is small enough to evade LEP and LHC constraints, but large enough to give a substantial contribution to the tree-level Higgs mass, thus reducing the required mass scale of supersymmetric particles. Essentially only a single parameter is left undetermined that controls the gravitino phenomenology and can lead to novel collider signatures.

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