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Exploring the phenomenology of weak adjoint scalars in minimal R-symmetric models

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We examine the phenomenology of the scalar fields in weak and Higgs sectors of minimal R-symmetric models, in particular the 'swino' and 'sbino', the scalar partners to the chiral fields that marry the electroweak gauge bosons in Dirac gaugino models. These fields are in adjoint representations of SU(2) and U(1) and have both CP-even and CP-odd components. The interactions of these new states are summarized, and decay widths are computed analytically to one loop order. We discuss the tree level contributions of these new states to the mass spectrum of MSSM sfermions. We also explore production cross sections and decay signatures at colliders for several chosen benchmarks. We find that large regions of parameter space are unconstrained by present collider data.

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