Low energy supergravity revisited

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Although the Standard Model of particle physics is a great success that culminated by the recent discovery of a Higgs boson, several theoretical shortcomings remain open. A more fundamental theory is needed.

Among all theories proposed since 40 years, supersymmetry and supergravity can alleviate some of these shortcomings introducing a natural symmetry between fermions and bosons and including naturally the gravitation. One consequence of supersymmetric theories is the existence of a superpartner for each Standard Model particle. But particles and superpartners are degenerated in mass: supersymmetry must be broken. Gravity mediated supersymmetry breaking is one possible scenario, but constrained by consistency rules at low energy.

In particular the allowed forms of the interaction between hidden and visible sectors have been known for a long time. Revisiting the analysis of these consistency rules, we find new solutions with some possibly interesting phenomenological consequences.

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