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Decoupling the Gravity Multiplet from Supergravity

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The full machinery of supergravity (SUGRA) is required to understand many SUSY models. For the purposes of understanding phenomenology at colliders and in cosmology, though, the main concern is to ascertain the effects of SUGRA on the vacuum structure and particle spectrum. Practical SUGRA calculations often require cumbersome manipulations of component field terms involving the full gravity multiplet. In this talk, I will present an alternative gauge fixing for conformal SUGRA which decouples these gravity complications from SUGRA computations. This yields a simplified tree-level action for the matter fields in SUGRA which can be expressed compactly in terms of superfields and a modified conformal compensator. As a concrete application, I will show how this new gauge fixing makes it possible to cleanly calculate the mass spectrum of goldstini arising from a general admixture of F-term, D-term, and almost no-scale supersymmetry breaking.

Primary author: D'ERAMO, Francesco (MIT)

Presenter: D'ERAMO, Francesco (MIT)

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