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Multimetric Supergravities

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In the last few years a new class of theories has been discovered consistently describing massive spin-2 fields nonlinearly interacting with a single massless one. These multimetric gravities provide a solution to the problem of the so-called Boulware-Deser ghost, previously thought to unavoidably plague any interacting theory of massive spin-2 particles. We note that their action in the vielbein formulation admits a natural extension in terms of integral forms on a supermanifold, which will be locally supersymmetric by construction, and thus will describe a new class of couplings between supergravity and massive spin-2 multiplets. We propose superfield actions for N=1 multimetric supergravities in spacetime dimensions up to four, and discuss the problems related to their component expansion, comparing them with the simpler case of multi-gauge fields.

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