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Higher-order constraints for N=1 and N=2 superfields and non-linear SUSY

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We study real higher-order constraints for $calN = 1$ and $calN = 2$ chiral superfields, which describe spontaneously broken (to $calN = 0$) and non-linearly realized supersymmetry in the presence of a light axion of a spontaneously broken global $U(1)$. For $calN = 1$ the constraint is of third order, while for $calN = 2$ it is of fifth order and can be imposed on abelian vector or tensor (linear) multiplet. In both cases the constraint eliminates a single real scalar (saxion) in terms of goldstino field(s).

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