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Higher Derivative Supergravity and Implications for Moduli Stabilization

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We study specific classes of four-derivative terms for chiral superfields in N = 1 supersymmetry and supergravity. These terms induce cubic polynomial equations of motion for the chiral auxiliary fields and correct the scalar potential. We discuss the different solutions and argue that only one of them is physically relevant. Special attention is paid to the corrections along flat directions which can be stabilized or destabilized by the higher-derivative terms. As a particular example we show that within α corrected type IIB flux compactifications higher derivative terms could stabilize a large volume without any non-perturbative contribution.

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