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Higher Derivative 6D Supergravity and Quaternionic Kahler Spaces

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I will describe the construction of a curious 4-derivative extension of 6D, N=(1,0) supergravity coupled to hypermultiplets whose scalar fields parametrize a quaternionic projective space. Surprisingly, we find that the inclusion of the Riemann-squared term is not allowed. Dimensional reduction of Bergshoeff-de Roo heterotic supergravity with Riemann-squared terms, on the other hand, suggests that such an inclusion should be possible if the scalars parametrize a Grassmannian coset. To compare the two cases, I will describe the dimensional reduction of BdR supergravity on 4-torus followed by a consistent truncation to (1,0) supersymmetry. In this case, we can see that the Riemann-squared term and 4-derivative scalar field couplings co-exist, but we also encounter an obstacle due to presence of certain terms in the fermionic sector that break the expected SO(4)xSO(4) composite local symmetry down to its diagonal SO(4) subgroup.

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