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On the moduli space curvature at infinity

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We analyse the scalar curvature of the vector multiplet moduli space of type IIA string theory compactified on a Calabi–Yau manifold. While the volume of this moduli space is known to be finite, cases have been found where the scalar curvature diverges positively along trajectories of infinite distance. We classify the asymptotic behaviour of the scalar curvature for all large volume limits within the moduli space, for any choice of Calabi-Yau, and provide the source of the divergence both in geometric and physical terms. Geometrically, there are effective divisors whose volumes do not vary along the limit. Physically, the EFT subsector associated to such divisors is decoupled from gravity along the limit, and defines a rigid N = 2 field theory with a non-vanishing moduli space curvature. We propose that the relation between scalar curvature divergences and field theories decoupled from gravity is a common trait of moduli spaces compatible with quantum gravity.

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