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Deformation theory of nearly Kähler instantons

In joint work with Derek Harland, we have developed the deformations theory for instantons on nearly Kähler six-manifolds using spinors and Dirac operators. Using this framework we identify the space of deformations of an irreducible instanton with semisimple structure group with the kernel of an elliptic operator. As an application, we show that the canonical connection on three of the four homogeneous nearly Kähler six-manifolds G/H is a rigid instanton with structure group H. In contrast, these connections admit large spaces of deformations when regarded as instantons on the tangent bundle with structure group SU(3).