



Mathematics > Differential Geometry

Deformation of extremal metrics, complex manifolds and the relative Futaki invariant

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Let (X, Ω) be a closed polarized complex manifold, g be an extremal metric on X that represents the Kähler class $[\Omega]$, and G be a compact connected subgroup of the isometry group $\text{Isom}(X, g)$. Assume that the Futaki invariant relative to G is nondegenerate at g . Consider a smooth family $(M_t \rightarrow B)$ of polarized complex deformations of (X, Ω) $\simeq (M_0, \Theta_0)$ provided with a holomorphic action of G with trivial action on B . Then for every $t \in B$ sufficiently small, there exists an $h^{1,1}(X)$ -dimensional family of extremal Kähler metrics on M_t whose Kähler classes are arbitrarily close to $[\Theta_t]$. We apply this deformation theory to show that certain complex deformations of the Mukai-Umemura 3-fold admit Kähler-Einstein metrics.

Comments: 22 pages. A mistake concerning the application of our main result to the Mukai-Umemura 3-fold and its deformations has been corrected. The title has been changed according to the referee's request

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