

On the Stability of Kähler-Einstein Metrics

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An Einstein metric is stable if the second variation of the total scalar curvature functional is nonpositive in the direction of changes in conformal structures. Using spin^c structures, we prove that a compact Einstein metric with nonpositive scalar curvature that admits a nonzero parallel spin^c spinor is stable. In particular, all metrics with nonzero parallel spinor (these are Ricci flat with special holonomy such as Calabi-Yau and G_2) and Kähler-Einstein metrics with nonpositive scalar curvature are stable. In fact we show that metrics with nonzero parallel spinor are local maxima for the Yamabe invariant and any metric of positive scalar curvature cannot lie too close to them. Similar results also hold for Kähler-Einstein metrics with nonpositive scalar curvature. This is a joint work with Xianzhe Dai and Xiaodong Wang.