Blair, D. E.; **Ianus, S.**

Critical associated metrics on symplectic manifolds. (English) Zbl 0591.53030

Nonlinear problems in geometry, Proc. AMS Spec. Sess., 820th Meet. AMS, Mobile/Ala. 1985, Contemp. Math. 51, 23-29 (1986).

[For the entire collection see Zbl 0579.00012.]

Let R be the scalar curvature and R^* the *-scalar curvature on a compact symplectic Riemannian manifold M. The authors consider the integrals $\int_M RdV$ and $\int_M (R-R^*)dV$ as functions on the set of all metrics associated to the symplectic structure. For both these functions they show that the critical points are associated metrics for which the Ricci operator commutes with the corresponding almost complex structure. Thus, Kähler metrics, when they exist, are maximum points for the second function.

Concerning the Goldberg conjecture and further development I think that the second-derivative test for extrema is important.

Reviewer: C.Udrişte

MSC:

53C15 General geometric structures on manifolds (almost complex, almost product structures, etc.)
53C55 Global differential geometry of Hermitian and Kählerian manifolds

Keywords:

critical metrics; scalar curvature; symplectic structure; Ricci operator; almost complex structure; Goldberg conjecture