Abdelkader, O.
Embedding of a compact Kähler manifold into complex projective space. (English)
Zbl 1035.32017
Tensor, New Ser. 60, No. 3, 242-244 (1998).

From the introduction: We consider a restricted class of Kähler manifolds defined by a certain topological condition. *K. Kodaira*'s well known embedding theorem [see e.g. Ann. Math. (2) 60, 28–48 (1954; Zbl 0057.14102)] can be formulated as follows: A compact complex analytic manifold M is projective algebraic if and only if there exists a positive line bundle on it.

In this paper we show that the assumption on the line bundle may be weakened if we replace it by the canonical line bundle K of M. According to [*S.-T. Yau*, Commun. Pure Appl. Math. 31, 339–411 (1978; Zbl 0369.53059), Theorem 2], on a compact Kähler manifold M any condition on the positivity (resp. negativity) of the first Chern class of M is equivalent to the same condition on the positivity (resp. negativity) of the Ricci curvature of M. In view of this results and the fact that the first Chern class of M is equal to the Chern class of the dual line bundle K^* of K, we prove the following embedding theorem: Theorem. Let M be a compact connected Kähler manifold of complex dimension n, and μ_i $(i = 1, 2, \dots, n)$ be the eigenvalues of the Ricci curvature of M with respect to the Kähler metric ds^2 on M. Suppose that $\mu_i + \mu_j \geq 0$ at each point of M and $\mu_i + \mu_j \leq 0$ at one point of M for any i, j, such that $1 \leq i < j \leq n$, then M is projective algebraic.

MSC:

32Q40 Embedding theorems for complex manifolds
32Q15 Kähler manifolds
32L20 Vanishing theorems
53C55 Global differential geometry of Hermitian and Kählerian manifolds

Keywords:

Kähler manifolds; embedding theorem; projective algebraic

Edited by FIZ Karlsruhe, the European Mathematical Society and the Heidelberg Academy of Sciences and Humanities
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