

Eliashberg, Yakov

Topological characterization of Stein manifolds of dimension > 2 . (English) Zbl 0699.58002
Int. J. Math. 1, No. 1, 29-46 (1990).

In this paper is given a topological characterization of Stein manifolds of dimension > 2 .

The main result is the following: Let X be a $2n$ -dimensional smooth manifold, $n > 2$, with an almost complex structure J and assume that there exists a proper Morse function $\phi : X \rightarrow \mathbb{R}$ such that the indexes of all its critical points are $\leq n$. Then there exists a complex structure \tilde{J} on X such that (X, \tilde{J}) is Stein. In fact the author shows that the new structure \tilde{J} can be chosen such that J is homotopic to \tilde{J} and ϕ is \tilde{J} -convex. By a well-known result of Grauert (X, \tilde{J}) is Stein.

Reviewer: [M.Colţoiu](#)

MSC:

- [58A05](#) Differentiable manifolds, foundations
- [58E05](#) Abstract critical point theory (Morse theory, Lyusternik-Shnirel'man theory, etc.) in infinite-dimensional spaces
- [32E10](#) Stein spaces, Stein manifolds
- [53C15](#) General geometric structures on manifolds (almost complex, almost product structures, etc.)

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Keywords:

topological characterization of Stein manifolds; smooth manifold; almost complex structure

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