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ON COMPLETE KÄHLER MANIFOLDS WITH FAST CURVATURE DECAY

KENICHI SUGIYAMA

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0. Introduction

We call (M, o) a Riemannian manifold with a pole iff M is a Riemannian manifold and $\exp_o$: $T_oM \to M$ is a global diffeomorphism. We define the radial curvatures at $x \in M$ as the sectional curvatures of all the 2-dimensional planes in T_xM which are tangent to the unique geodesic joining the pole o to x, and write $r(x)$ for the distance function from o. Suppose now our (M, o) satisfies the following conditions:

(0.1) There exist C^∞ functions k, K: $[0, \infty) \to [0, \infty)$ such that

1. $-K(r(x)) \leqq$ all the radial curvatures at $x \leqq k(r(x))$,

2. $\int_0^\infty sK(s)ds < \infty$,

3. $\int_0^\infty sk(s)ds \leqq 1$.

In this paper, we shall prove the following theorem.

Main Theorem. *Let (M, o) be an n-dimensional complete Kähler manifold with a pole o satisfying condition* (0.1) ($n \geqq 2$). *Moreover assume that there exists a C^∞ function H: $[0, \infty] \to [0, \infty)$ such that*

(0.2) $$\int_0^\infty sH(s)ds < \infty ,$$

and

(0.3) $$-H(r(x)) \leqq \text{tha Ricci curvature at } x \leqq H(r(x)) .$$

Then there exists a positive constant γ_0 depending only on $K(s)$ such that if

$$\int_0^\infty sk(s)ds < \gamma_0 ,$$

M is biholomophic to C^n.

It was conjectured by Greene and Wu that if M is an n-dimensional com-