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On infinitesimal holomorphically projective transformations in compact Kaehlerian manifolds

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§ 1. Introduction.

One of the authers has proved the following theorems (K. Yamauchi [6], [8]).

THEOREM A. *In a compact orientable Riemannian manifold with non-positive constant scalar curvature, an infinitesimal projective transformation is necessarily an infinitesimal isometry.*

THEOREM B. *Let M be a compact, orientable and simply connected n-dimensional ($n \geqq 3$) Riemannian manifold with constant scalar curvature R. If M admits a non-isometric infinitesimal projective transformation, then M is isometric to a sphere of radius $\sqrt{n(n-1)/R}$.*

It is natural to consider the Kaehlerian analogues corresponding to the above theorems. In this paper, we shall investigate the infinitesimal holomorphically projective transformations in compact Kaehlerian manifolds with constant scalar curvature and prove the following theorems.

THEOREM 1. *In a compact Kaehlerian manifold with non-positive constant scalar curvature, an infinitesimal holomorphically projective transformation is necessarily an infinitesimal isometry.*

THEOREM 2. *Let M be a compact and simply connected n-dimensional ($n=2m \geqq 4$) Kaehlerian manifold with constant scalar curvature R. If M admits a non-isometric infinitesimal holomorphically projective transformation, then M is holomorphically isometric to a complex m-dimensional projective space with the Fubini-Study metric of constant holomorphic sectional curvature $R/m(m+1)$.*

T. Kashiwada announced Theorem 1. However the proof given in [2] turned to be incomplete.

In this paper, we assume that the Riemannian manifolds under consideration are connected, differentiable and of dimension $\geqq 3$.