# H-projective-recurrent Kählerian manifolds and Bochner-recurrent Kählerian manifolds

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## Introduction.

T. Adati and T. Miyazawa [1] investigated the conformal-recurrent Riemannian manifolds and M. Matsumoto [2] the projective-recurrent Riemannian manifolds. In their paper, they concerned with the more general Riemannian manifolds, that is, the Riemannian metric $g$ is not necessarily positive definite.

Recently, L. R. Ahuja and R. Behari [3] studied the H-projettive-recurrent Kählerian manifolds.

The purpose of the present paper is to make researches in the H-projective-recurrent Kählerian manifolds and the Bochner-recurrent Kählerian manifolds.

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## § 1. Preliminaries.

Let $M$ be an $n(=2m)$ dimensional Kählerian manifold with Kählerian structure $(g, J)$ satisfying

$$J^i{}_a J^a{}_j = -\delta^i{}_j, \quad J_{ij} = -J_{ji}, \quad \nabla_h J^i{}_j = 0, \tag{1.1}$$

where $J_{ij} = g_{ia} J^a{}_j$.

It is well known that the tensor

$$P_{hijk} = R_{hijk} - \frac{1}{n+2}(R_{ij}g_{hk} - R_{hj}g_{ik} + H_{ij}J_{hk} - H_{hj}J_{ik} - 2H_{hi}J_{jk}), \tag{1.2}$$

where $H_{ij} = R_{ia}J^a{}_j$, is called the holomorphically projective (for brevity, H-projective) curvature tensor of $M$, and the tensor

$$\begin{aligned} B_{hijk} = R_{hijk} - \frac{1}{n+4}(&R_{ij}g_{hk} - R_{hj}g_{ik} + H_{ij}J_{hk} - H_{hj}J_{ik} - 2H_{hi}J_{jk} \\ &+ R_{hk}g_{ij} - R_{ik}g_{hj} + H_{hk}J_{ij} - H_{ik}J_{hj} - 2H_{jk}J_{hi}) \\ &+ \frac{R}{(n+2)(n+4)}(g_{ij}g_{hk} - g_{hj}g_{ik} + J_{ij}J_{hk} - J_{hj}J_{ik} - 2J_{hi}J_{jk}) \end{aligned} \tag{1.3}$$