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KŌDAI MATH. SEM. REP.
28 (1977), 372—380

ON COMPLEX WEYL-HLAVATÝ CONNECTIONS

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§ 0. Introduction.

To generalize results in conformal Riemannian geometry to those in Kaehlerian geometry, one of the present authors introduced in [4] what he calls a complex conformal connection in a Kaehlerian manifold. In this study, a curvature tensor introduced by Bochner [1] plays the rôle of the conformal curvature tensor of Weyl.

It is well known that the so-called Weyl-Hlavatý connection, that is, a linear connection D without torsion such that $\nabla_k g_{ji}=-2p_k g_{ji}$, p_k being a covector field, plays an important rôle in conformal Riemannian geometry, [5].

The main purpose of the present paper is to introduce a complex analogue of Weyl-Hlavatý connection in a Kaehlerian manifold and study its properties.

In § 1, we state some preliminaries on Kaehlerian geometry and on the Bochner curvature tensor and in § 2 we introduce what we call a complex Weyl-Hlavatý connection. § 3 is devoted to the study of the curvature tensor of a complex Weyl-Hlavatý connection. Using the results obtained in § 3, we prove our main theorem in § 4.

§ 1. Preliminaries.

We consider a Kaehlerian manifold M of real n dimensions ($n\geqq 4$) covered by a system of coordinate neighborhoods $\{U; x^h\}$ and denote by g_{ji} and $F_i{}^h$ components of the Hermitian metric tensor and those of the almost complex structure tensor of M respectively, where and in the sequel the indices $h, i, j, \cdots$ run over the range $\{1, 2, \cdots, n\}$.

Then we have

$$F_i{}^t F_t{}^h=-\delta_i^h, \qquad F_j{}^t F_i{}^s g_{ts}=g_{ji} \tag{1.1}$$

and

$$\nabla_k g_{ji}=0, \qquad \nabla_k F_i{}^h=0, \qquad \nabla_k F_{ji}=0, \tag{1.2}$$

where ∇_k denotes the operator of covariant differentiation with respect to the

Received April 2, 1976