On Conformally Recurrent Kahlerian-Weyl Spaces

An $m$-dimensional manifold $W_m(g_{ij}, T_k)$ with a conformal metric tensor $g_{ij}$ and a symmetric connection $\nabla_k$ is called a Weyl space if the compatibility condition $\nabla_k g_{ij} - 2 T_k g_{ij} = 0$ is satisfied, where $T_k$ is a covariant vector field.

If the Weyl space $W_m$ admits an almost Hermitian structure $F_{ij}$ that satisfies $\nabla_k F_{ij} = 0$ (for all $i, j, k$) then $W_m$ is called a Kahlerian space.

We consider an $m$-dimensional Weyl space $W_m$ with Kahlerian structure. Let $R_{ijkl}$ and $F_{ij} = g^{ih} F_{jk}^i$ be the covariant curvature tensor of weight $\{2\}$ and skew-symmetric tensor of type $(2,0)$ of weight $\{-2\}$ of $W_m$, respectively. Define the tensor $G_{ij}$ of weight $\{0\}$ by $G_{ij} = H_{ij} - H_{ji}$, where $H_{ij} = \frac{1}{2} R_{ijkl} F^{kl}$.

In this work, the properties related with the tensors $H_{ij}$ and $G_{ij}$ are given and it is proved that $G_{ij}$ is proportional to $F_{ij}$ if and only if the space $W_m$ is an Einstein-Weyl space. Furthermore, for conformally recurrent Kahlerian-Weyl space we obtained that Kahlerian Weyl space will be a conformally recurrent if and only if it is a recurrent Weyl space.

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