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On the Geometry of Weyl Manifolds

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Abstract - We consider a Weyl manifold $(M, \widehat{g}, w)$. Let $\overset{0}{\nabla}$ be the Levi -Civita connection with respect to $g \in \widehat{g}$, and ∇ be the Weyl connection.We suppose that $dimM \geq 3$ and the Ricci tensor associated to g is nondegenerated. Let $\overset{0}{R}$ and R be the curvature tensors with respect to $\overset{0}{\nabla}$ and ∇, respectively. In this paper we prove that $\nabla_X R = \nabla_X \overset{0}{R}$, $\forall\ X \in \mathcal{X}(M)$, if and only if the Weyl connection and the Levi-Civita connection coincide.
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