

A New Curvaturelike Tensor Field in an Almost Contact Riemannian Manifold II

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In the last paper, we introduced a new curvaturelike tensor field in an almost contact Riemannian manifold and we showed some geometrical properties of this tensor field in a Kenmotsu and a Sasakian manifold [4].

In this talk, we define another new curvaturelike tensor field, named $(CHR)_2$ -curvature tensor in an almost contact Riemannian manifold which is called a contact holomorphic Riemannian curvature tensor of the second type (See (2.2)). Then, using this tensor, we mainly research $(CHR)_2$ -curvature tensor in a Kenmotsu and Sasakian manifold. Then we introduce the notion of the flatness of a $(CHR)_2$ -curvature tensor and we show that a Kenmotsu and a Sasakian manifold with a flat $(CHR)_2$ -curvature tensor is flat. Next, we introduce the notion of $(CHR)_2$ - η -Einstein in an almost contact Riemannian manifold. In particular, we show that a Kenmotsu or Sasakian $(CHR)_2$ - η -Einstein manifold is η -Einstein. Moreover, we define the notion of $(CHR)_2$ -space form and consider this in a Kenmotsu and a Sasakian manifold. Finally, we consider a conformal transformation of an almost contact Riemannian manifold and we get new invariant tensor fields (not the conformal curvature tensor) under this transformation.

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