

On Geodesically Related Riemannian Spaces

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Abstract - We study the geodesic correspondence of some Riemannian spaces, endowed with certain birecurrent tensor fields, generalizing results of Vranceanu, Siniukov and Venzi.

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1 Introduction

The subject matter of this article is the investigation of the properties of a Riemannian space with a certain tensor birecurrent geodesically related to other Riemannian space. The result obtained is a generalization of the results of Vranceanu, Siniukov, Venzi.

Let (V, g) be a n -dimensional pseudoriemannian manifold. The projective Weyl's curvature tensor is defined by:

$$P_{jkl}^i = R_{jkl}^i - \frac{1}{n-1} (\delta_k^i R_{jl} - \delta_l^i R_{jk})$$

and the concircular tensor by

$$Z_{jkl}^i = R_{jkl}^i - \frac{R}{n(n-1)} (\delta_k^i g_{jl} - \delta_l^i g_{jk})$$

where R_{jkl}^i , R_{ji} , R denote respectively the curvature tensor, the Ricci tensor and the scalar curvature.

Let a , b , c be real numbers. We define

$$\begin{aligned} T_{jkl}^i &= aR_{jkl}^i + bP_{jkl}^i + cZ_{jkl}^i \\ S_{jkl}^i &= aR_{jkl}^i + cZ_{jkl}^i \end{aligned}$$