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ON SOME NEW TENSORS AND THEIR PROPERTIES IN A FIVE-DIMENSIONAL FINSLER SPACE-III

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ABSTRACT

Berwald [1, 2] developed the study of two-dimensional Finsler spaces, whose idea was followed by Moor [9] to introduced in a three-dimensional Finsler space the intrinsic field of orthonormal frame consisting of normalized support element l^i, normalized torsion vector m^i and the unit vector n^i, orthogonal to both l^i and m^i. Various aspects of three-dimensional Finsler spaces have been studied by Rund [5], Matsumoto [6,7,8], Rastogi [12,13,14] and others. Similarly four-dimensional Finsler spaces have been studied by Pandey and Dwivedi [10] and Rastogi [15] etc. Theory of five-dimensional Finsler spaces in terms of scalars has been studied by Pandey, Dwivedi and Gupta [11] and Dwivedi, Rastogi and Dwivedi [4]. In 1990, certain new tensors were defined and studied by Rastogi [12], while in 2019 Rastogi [14] introduced a new tensor D_{ijk} in three-dimensional Finsler space, which is similar to tensor C_{ijk}, but satisfies different properties like $D_{ijk}\, l^i = 0$ and $D_{ijk}g^{jk} = D_i = D\, n_i$. This tensor exists only in Finsler spaces of more than two-dimensions. This tensor was further studied in four-dimensional Finsler space by Rastogi [15], but it is important to note that there are two tensors of such type in four-dimensional Finsler space. In this paper besides studying variety of tensors and their properties in a five-dimensional Finsler space, we have also studied various kinds of D-tensors which are actually three in F^5.

KEYWORDS: *Five-Dimensional Finsler Spaces, D-Tensors, Q-Tensor, D-Reducibility*