

Generalized Randers metrics with special 1-form

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Abstract. In this paper, we investigate a generalized Randers metric with a special π -form. Precisely, following the pullback approach to global Finsler geometry, we start with a Finsler metric (M, L) that admits a concurrent π -vector field, then we consider the Randers change $\tilde{L} = L + \mathfrak{B}$, where \mathfrak{B} is the associated 1-form. We study some of the geometric objects and properties attached to (M, \tilde{L}) . We prove that the corresponding metric tensor of \tilde{L} is nondegenerate without any conditions on the 1-form \mathfrak{B} . By calculating the relation between the attached geodesic sprays of L and \tilde{L} , we establish that the change $\tilde{L} = L + \mathfrak{B}$ preserves the geodesics of (M, L) , that is, the change is projective. Moreover, under certain condition, this change preserves the deviation tensor, the (v)h-torsion tensor, the (h)h-curvature tensor and the curvature tensor of Barthel connection. We provide an example of a Finsler metric with some details that admits a concurrent vector field together with the associated π -form.

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