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ON HOMOGENEOUS EINSTEIN KROPINA SPACE

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Abstract: In this paper, we study homogeneous Einstein Kropina metric. First, we characterize the sufficient and necessary condition for a homogeneous Kropina metric to be Einstein and with vanishing S-curvature.Further, we study the conformal deformation of the metric $F(\alpha, \beta) = K(\alpha, \beta) + \varepsilon(x)\beta$, where $K(\alpha, \beta) = \dfrac{\alpha^2}{\beta}$ and $\varepsilon(x)$ depends on the position only. Finally, we prove that the conformal deformation of Kropina metric is single colored.

Keywords and Phrases: Homogeneous Finsler space, Einstein space, Ricci curvature, S-curvature, Berwald space, Single colored.

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1. Introduction

It is important to study the Einstein manifolds in Riemannian -Finsler geometry. A Finsler metric $F(x, y)$ on an n-dimensional manifold M is called an Einstein metric [28], if there exists a scalar function $\lambda(x)$ on M such that

$$Ric = \lambda(x)F^2.$$

Recentlty, some progress has been made on Einstein Finsler metrics of (α, β) type. In [3], the authors D. Bao and C. Robles have shown that every Randers metric of dimension $(n \geq 3)$ is necessarily Ricci constant. A 3-dimensional Randers metric is Einstein iff it is constant flag curvature, see more in ([2], [5], [7], [13], [21],