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CONSTANT CURVATURE CONDITIONS FOR GENERALIZED KROPINA SPACES

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Abstract: The classification of Finsler spaces of constant curvature is an interesting and important topic of research in differential geometry. In this paper we obtain necessary and sufficient conditions for generalized Kropina space to be of constant flag curvature.

Keywords and Phrases: Riemannian spaces, Killing vector fields, Finsler metrics, Kropina metrics, Generalized Kropina metrics.

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1. Introduction

Finsler metrics are generalization of Riemannian metrics in the sense that they depend on both the position and direction while its counterpart depend only on position. Generalized Kropina metric belongs to the large class of (α, β)-metrics. (α, β)-metrics were firstly introduced by Matsumoto [8]. They are constructed by Riemannian metric $\alpha = \sqrt{a_{ij}(x)y^i y^j}$ and the differential 1-form $\beta = b_i(x)y^i$. Some remarkable (α, β)-metrices are: Randers metric: F = α + β; Kropina metric: F = $\frac{\alpha^2}{\beta}$; generalized Kropina metric: F = $\frac{\alpha^{m+1}}{\beta^m}$ (m $\neq$ -1, 0, 1); Matsumoto metric : F = $\frac{\alpha^2}{\alpha-\beta}$ and square metric: F = $\frac{(\alpha+\beta)^2}{\alpha}$. Contrary to other ($\alpha$, β)-metrics, Kropina