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On Flag Curvature and Homogeneous Geodesics of Left Invariant Randers Metrics on the Semi-Direct Product $\mathfrak{a} \oplus_p \mathfrak{r}$

We study flag curvature and homogeneous geodesics of left invariant Randers metrics on the Lie group with Lie algebra $\mathfrak{a} \oplus_{\mathfrak{p}} \mathfrak{r}$, where $\mathfrak{a}$ and $\mathfrak{r}$ are abelian Lie algebra of dimension n and 1, respectively. We give their flag curvature formulas explicitly. We show that there is an $(n+1)-$dimensional Lie group with left invariant Randers metric which admits exactly one homogeneous geodesic.

Keywords: Invariant metric, Randers metric, flag curvature, homogeneous geodesics, semi-direct product.

MSC: 53C60, 53C30