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Some regularity theorems for Carnot-Caratheodory metrics. (English) Zbl 0687.53041

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The geodesics on a smooth manifold M with respect to a Carnot- Caratheodory metric induced by a smooth distribution Q and a smooth Riemannian metric on Q are investigated. At each point p of M an exponential map at p is defined which is of maximal rank on an open and dense subset of its domain of definition. It is shown that an isometry of the Carnot-Caratheodory metric is a smooth diffeomorphism of M. As an example, left invariant Carnot-Caratheodory metrics on nilpotent homogeneous Lie groups are studied.

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