Alekseevsky, D. V.

Riemannian manifolds of cohomogeneity one. (English) Zbl 0795.53044

Szenthe, J. (ed.) et al., Differential geometry and its applications. Proceedings of a colloquium, held in Eger, Hungary, August 20-25, 1989, organized by the János Bolyai Mathematical Society. Amsterdam: North- Holland Publishing Company. Colloq. Math. Soc. János Bolyai. 56, 9-22 (1992).

The present author defined in 1979 a cohomogeneity one Riemannian manifold, shortly a $C1$ manifold, as a G-manifold with at least one orbit of codimension one and admitting a complete G-invariant Riemannian metric. Later, L. Berárd-Bergery showed that the orbit space of a $C1$ manifold is either R, or S^1, or R^+, or a closed interval. In the first two cases, all orbits have codimension one; in the third case there is one singular orbit and in the last case there are two singular orbits. In the present work, the author describes smooth invariant metrics on $C1$ manifolds and studies geodesics which are normal to the orbits. The cases with none, one or two singular orbits are investigated separately. A large number of interesting results is given with comments but without proofs.

For the entire collection see [Zbl 0764.00002].

Reviewer: O.Kowalski (Praha)

MSC:

53C30 Differential geometry of homogeneous manifolds
53C22 Geodesics in global differential geometry

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G-manifold; G-invariant Riemannian metric; geodesics