

On the reparametrization of homogeneous geodesics

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A geodesic in a homogeneous pseudo-Riemannian or affine manifold is said to be homogeneous if it is an orbit of an one-parameter group of isometries, or, of affine diffeomorphisms, respectively. A homogeneous pseudo-Riemannian or affine manifold is a g.o. manifold if every geodesic is homogeneous.

On pseudo-Riemannian manifolds, the parameter of the group of isometries may be different from the affine parameter of the geodesic only for null homogeneous geodesics. Nevertheless, for all known examples of pseudo-Riemannian g.o. manifolds, these parameters are the same for all homogeneous geodesics. In the affine case, there are g.o. manifolds whose almost all geodesics must be reparametrized.

In the talk, the features of homogeneous geodesics in pseudo-Riemannian homogeneous manifolds and g.o. manifolds will be recalled, the new approach for the study of homogeneous geodesics in affine homogeneous manifold will be explained and the new phenomena which appear in the affine case will be illustrated.

References

- [1] Dušek, Z.: On the reparametrization of affine homogeneous geodesics, preprint.
- [2] Dušek, Z., Kowalski, O., Vlášek, Z.: Homogeneous geodesics in homogeneous affine manifolds, preprint.