

∇ -Einstein connections on Lorentzian spheres

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ABSTRACT

Every odd dimensional sphere can be endowed with a natural Lorentzian metric. On the contrary to the Riemannian case, these metrics do not satisfy the Einstein condition. Recently, the notion of ∇ -Einstein manifold has been introduced in [2] as follows. A semi-Riemannian manifold (M, g) is said to be ∇ -Einstein when there exists a metric affine connection ∇ on M with nonzero torsion tensor and sharing geodesics with the Levi-Civita connection such that the corresponding Ricci tensor of ∇ is proportional to the metric g . We provide an exhaustive list of the ∇ -Einstein affine connections on the Lorentzian odd dimensional spheres which are invariant for some natural groups of isometries. In any case there exist such connections, and moreover, for some concrete dimensions the family of connections is a big variety.

A nice survey on the relevance of the geometries with torsion can be found in [1]. The invariant ∇ -Einstein affine connections on the Riemannian odd dimensional spheres have been studied in [3].

References

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