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in cooperation with the
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Lorentzian extrinsic symmetric spaces

Abstract

A non-degenerate connected submanifold $M \subset \mathbb{R}^{p,q}$ is called extrinsic symmetric if it is invariant under the reflection at each of its affine normal spaces. Extrinsic symmetric spaces in $\mathbb{R}^{p,q}$ are exactly those complete submanifolds whose second fundamental form is parallel. Extrinsic symmetric spaces in the Euclidean space are well understood. A classification of these spaces follows from a nice construction due to Ferus. The pseudo-Riemannian case seems to be more involved. Here we want to discuss some classification results for Lorentzian extrinsic symmetric spaces.