

Lorentzian Surfaces in Semi-Euclidean Spaces and their Gauss map

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Abstract

The notion of the finite type mappings was introduced by B. Y. Chen et. al. in the middle of 1980's during his program of understanding the finite type submanifolds in semi-Euclidean spaces. A mapping $\phi : M \rightarrow \mathbb{E}_S^N$ is said to be of k -type if it can be expressed as a sum of eigenvectors corresponding from k distinct eigenvalues of Δ . If such a k exists, then ϕ is said to be finite type. In addition, if one of these eigenvalues is zero, then ϕ is said to be null k -type.

In this paper, we want to present several classification theorems on Lorentzian surfaces in 4-dimensional semi-Euclidean spaces in terms of type of their Gauss map. First, we give a brief summary about results obtained by other geometers. Then, we show our recent results in Lorentzian surfaces with constant mean curvature. Finally, we discuss some open problems.

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