

Contacts of Spacelike Hypersurfaces in De Sitter Space with ϕ -Hyperbolic Flat Hyperquadrics

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(This is a joint work with Mikuri Asayama, Shyuichi Izumiya and Aiko Tamaoki.)

Abstract

It is known that there are three kinds of pseudo-spheres in Lorentz-Minkowski space which are called Hyperbolic space, de Sitter space and lightcone. Four Legendrian dualities related with these pseudo-spheres were given in [3]. And these Legendrian dualities have been extended in [10] for one-parameter families depending on a parameter $\phi \in [0, \pi/2]$ of these pseudo-spheres. Moreover, as an application of these extended Legendrian dualities, one-parameter families depending on this parameter ϕ of new extrinsic differential geometries on spacelike hypersurfaces in the pseudo-spheres in Lorentz-Minkowski space have been constructed in [2,9,10]. This geometry related with ϕ is called slant geometry.

In this talk, first of all, the basic framework of slant geometry on spacelike hypersurfaces in de Sitter space is mentioned about. This geometry gives a lot of information about these hypersurfaces in de Sitter space, so that it includes the results of [11] as a special case. Then, some models (ϕ -hyperbolic flat hyperquadrics) which are invariant through the Lorentzian group are introduced and their contacts with the considered hypersurfaces are studied. These contacts are described by the singularities of ϕ -hyperbolic height functions defined on these hypersurfaces, [2].

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