

On surfaces in Euclidean and Lorentz-Minkowski 4-space and in particular double rotational surfaces

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In the first part of the talk we recall some theory on surfaces in Euclidean and Lorentz-Minkowski 4-space. Special attention is paid to the consequences of the existence of vectors of different causal characters as a result of the non-definite metric in Lorentz-Minkowski 4-space.

A special kind of surfaces in Euclidean and Lorentz-Minkowski 4-space is then constructed and studied in the second part of the talk. Namely, a double rotational surface is defined as the surface that is traced out by a planar curve which is subjected to two simultaneous rotations, possibly at different rotation speeds. Also here, especially the different possibilities for the construction of double rotational surfaces induced by the existence of vectors of different causal characters in Lorentz-Minkowski 4-space are examined. As an illustration of an interesting curvature property, flat double rotational surfaces are classified. In this classification cones over a Clelia curve in 4-space play a role.

Where possible the concepts in this exposition are visualized.

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