

Spacelike hypersurfaces of constant higher order mean curvature in generalized Robertson-Walker spacetimes

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Spacelike hypersurfaces in spacetimes are objects of increasing interest in recent years, both from a physical and a mathematical point of view. A basic question on this topic is the problem of uniqueness of spacelike hypersurfaces with constant mean curvature in certain spacetimes, and, more generally, that of spacelike hypersurfaces with constant higher order mean curvature.

In a recent paper, Alías and Colares [1] studied in depth the problem of uniqueness for compact spacelike hypersurfaces with constant higher order mean curvature in spatially closed generalized Robertson-Walker spacetimes. Their approach was based on the use of the so called Newton transformations P_k and their associated second order differential operators L_k , as well as on the application of some general Minkowski integral formulae for compact hypersurfaces. In this talk, which is based on the work in [3], we go deeper into this study. We consider first the case of compact spacelike hypersurfaces, completing some previous results given in [1] and we next extend these results to the complete noncompact case. Our approach is based on the use of a generalized version of the Omori-Yau maximum principle for trace type differential operators which includes the operators L_k that has been recently introduced by the authors in [2] for the study of hypersurfaces in Riemannian warped products.

This is a joint work with L. J. Alías and M. Rigoli.

References

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