

Trapped submanifolds into a null hypersurface of de Sitter space

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We study codimension two trapped submanifolds contained into one of the two following null hypersurfaces of de Sitter spacetime: (i) the future component of the light cone, and (ii) the past infinite of the steady state space.

For codimension two compact spacelike submanifolds in the light cone we show that they are conformally diffeomorphic to the round sphere. This fact enables us to deduce that the problem of characterizing compact marginally trapped submanifolds into the light cone is equivalent to solving the Yamabe problem on the round sphere, allowing us to obtain our main classification result for such submanifolds.

We also fully describe the codimension two compact marginally trapped submanifolds contained into the past infinite of the steady state space and characterize those having parallel mean curvature field. Finally, we consider the more general case of codimension two complete, non-compact, weakly trapped spacelike submanifolds contained into the light cone.

This is a joint work with Luis J. Alías and Marco Rigoli.

References

- [1] L. J. ALÍAS, V. L. CÁNOVAS AND M. RIGOLI, Trapped submanifolds into a null hypersurface of de Sitter space , *Preprint* (2016).

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