Semilinear Hyperbolic Equations in De Sitter Spacetime

Anahit Galstyan

University of Texas-Pan American, 1201 W. University Drive, Edinburg, TX 78539, USA

email: `agalstyan@utpa.edu`

Abstract We present some results on the semilinear massless waves propagating in the de Sitter spacetime. The global in time existence of the solutions for the Klein-Gordon equation in the de Sitter spacetime is known (due to Yagdjian, Nakamura, Galstian) with very weak restriction on the order of nonlinearity. However, the existence of such solutions for the Cauchy problem for the semilinear massless equation is still an open problem. We give the estimate for the lifespan of the solutions if the exponent of nonlinearity is less than the critical value given by Strauss conjecture. The case of the hyperbolic spatial part of the manifold is especially interesting since it appears in some cosmological models. We present the lifespan estimate in this case as well.

Bibliography

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