Long Range Scattering for the Klein-Gordon equation with nonhomogeneous nonlinearities

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Abstract.

The asymptotic stability of coherent states , like kinks in one dimension poses new great challenges. This is due to the long range nature of the dispersive equation. This talk will focus on one such problem. We study the 1D Klein-Gordon equation with quadratic and variable coefficient cubic nonlinearity. This problem exhibits a striking resonant interaction between the spatial frequencies of the nonlinear coefficients and the temporal oscillations of the solutions. We prove global existence and (in L-infinity) scattering as well as a certain kind of strong smoothness for the solution at time-like infinity with the help of several new classes of normal-forms transformations. The analysis also shows the limited smoothness of the solution, in the presence of the resonances.
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