Summary: We study the nonlinear Klein-Gordon equation on a product space $M = \mathbb{R} \times X$ with metric $\tilde{g} = dt^2 - g$ where $g$ is the scattering metric on $X$. We establish the global-in-time Strichartz estimate for Klein-Gordon equation without loss of derivative by using the microlocalized spectral measure of Laplacian on scattering manifold showed in [A. Hassell and J. Zhang, Anal. PDE 9, No. 1, 151–192 (2016; Zbl 1333.35226)] and a Littlewood-Paley squarefunction estimate proved in [J. Zhang, Adv. Math. 271, 91–111 (2015; Zbl 1308.35236)]. We prove the global existence and scattering for a family of nonlinear Klein-Gordon equations for small initial data with minimum regularity on this setting.

MSC:
35Q40 PDEs in connection with quantum mechanics
35S30 Fourier integral operators applied to PDEs
47J35 Nonlinear evolution equations
35A01 Existence problems for PDEs: global existence, local existence, non-existence

Keywords:
Strichartz estimate; scattering manifold; spectral measure; global existence; scattering theory

Full Text: DOI

References:


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Inventiones Mathematicae, pp. 1-133 (2013) - Zbl 1315.35015


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