LARGE GLOBAL SOLUTIONS FOR ENERGY-CRITICAL NONLINEAR SCHRÖDINGER EQUATION

RUOBING BAI

CENTER FOR APPLIED MATHEMATICS

TIANJIN UNIVERSITY

TIANJIN 300072, CHINA

In this work, we consider the 3D defocusing energy-critical nonlinear Schrödinger equation

$$i\partial_t u + \Delta u = |u|^4 u, \quad (t, x) \in \mathbb{R} \times \mathbb{R}^3.$$

Applying the outgoing and incoming decomposition presented in the recent work [1], we prove that any radial function f with $\chi_{\leq 1} f \in H^1$ and $\chi_{\geq 1} f \in H^{s_0}$ with $\frac{5}{6} < s_0 < 1$, there exists an outgoing component f_+ (or incoming component f_-) of f, such that when the initial data is f_+, then the corresponding solution is globally well-posed and scatters forward in time; when the initial data is f_-, then the corresponding solution is globally well-posed and scatters backward in time.

This is a joint work with Jia Shen and Yifei Wu.

References

[1] M. Beceanu, Q. Deng, A. Soffer and Y. Wu, Large global solutions for nonlinear Schrödinger equations II, mass-supercritical, energy-subcritical cases, Commu. Math. Phy., 382 (1), 2021, 173-237.