Global Well-posedness and Scattering of Defocusing Energy Subcritical Nonlinear Wave Equation in dimension 3 with radial data

Ruipeng Shen

Abstract I will talk about the defocusing case of the energy subcritical non-linear wave equation in $\mathbb{R}^3$.

\[
\begin{align*}
\partial_t^2 u - \Delta u + |u|^p u &= 0, \quad (x,t) \in \mathbb{R}^3 \times \mathbb{R}; \\
u|_{t=0} &= u_0 \in \dot{H}^s(\mathbb{R}^3); \\
\partial_t u|_{t=0} &= u_1 \in \dot{H}^{s-1}(\mathbb{R}^3).
\end{align*}
\]

Here

\[
p = \frac{2}{3/2 - s}.
\]

We assume the initial data is in the space $\dot{H}^s \times \dot{H}^{s-1}$ and radial. If $s = 1$, the initial data is in the energy space and the scattering results are known. We will deal with the case $15/16 < s < 1$, so that this problem is $\dot{H}^s \times \dot{H}^{s-1}$ critical. We will prove the global well-posedness and scattering of the solution under the additional assumption that the $\dot{H}^s \times \dot{H}^{s-1}$ norm of the solution is uniformly bounded for all time $t$ in the maximal lifespan of the solution.

References

