

The I-method and global well-posedness for the defocusing nonlinear Schrödinger equation

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October 20, 2009

1 Abstract

The defocusing, nonlinear Schrödinger equation of power type nonlinearity

$$\begin{aligned}iu_t + \Delta u &= |u|^\alpha u, \\ u(0, x) &= u_0 \in H^1(\mathbf{R}^n),\end{aligned}\tag{1.1}$$

has a global solution for $\alpha < \frac{4}{n-2}$. In this talk we discuss the *I*-method, which is used to prove global well-posedness for data in $H^s(\mathbf{R}^n)$, $s < 1$. In particular, we will address the L^2 - critical equation ($\alpha = \frac{4}{n}$) and the cubic equation in three dimensions.