

1 Abstract

For a nonlinear Schrodinger equation with power type inequality

$$iu_t + \Delta u = |u|^\alpha u \quad (1.1)$$

for some $\alpha \in \mathbf{R}$, the quantity

$$\|\nabla u(t)\|_2^2 + \frac{2}{2+\alpha} \int |u|^{2+\alpha} dx \quad (1.2)$$

is conserved for all time, which gives global existence of a solution when $\frac{4}{n} \leq \alpha < \frac{4}{n-2}$. In this talk we will examine global existence for data $u_0 \in H^\rho(\mathbf{R}^n)$ for some $\rho < 1$, by obtaining some conserved quantities.