

Normalized solutions of nonlinear Schrödinger equations with potential

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Abstract:

We discuss the existence of solutions $(u, \lambda) \in H^1(\mathbb{R}^N) \times \mathbb{R}^+$ of the nonlinear Schrödinger equation

$$-\Delta u + V(x)u + \lambda u = |u|^{p-2}u \quad \text{in } \mathbb{R}^N$$

with prescribed L^2 -norm $\|u\|_2 = \rho$. The nonlinearity is mass supercritical and Sobolev subcritical, i.e. $2 + \frac{4}{N} < p < 2^*$; the potential $V : \mathbb{R}^N \rightarrow \mathbb{R}$ is positive and vanishing at infinity, possibly having singularities.

The talk is based on joint work with Riccardo Molle, Matteo Rizzi, Gianmaria Verzini.