

Abstract

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“Uniform Sobolev Estimates for the Resolvent of Scaling-Critical Schrödinger Operators and Applications”

The uniform Sobolev estimate due to Kato-Yajima and Kenig-Ruiz-Sogge is a limiting absorption principles for the free resolvent in L^p spaces and can be regarded as a generalization of the Hardy-Littlewood-Sobolev inequality to non-zero energies. Recently, this estimate has been used by a series of papers by R. L. Frank and his collaborators to study spectral properties of Schrödinger operators with complex-valued potentials, such as Keller and Lieb-Thirring type inequalities. In this talk, I will discuss recent progress [arxiv.org/abs/1607.01187, arxiv.org/abs/1607.01727] on uniform Sobolev estimates for Schrödinger operators with real-valued potentials exhibiting scaling-critical singularity, and their applications to (1) Keller type eigenvalue bounds for Schrödinger operators with complex-valued potentials, and (2) global-in-time Strichartz and smoothing estimates for the Schrödinger equation. A typical example of critical potentials we have in mind is the inverse square potential. A part of this talk is based on joint work with Jean-Marc Bouclet (Toulouse III).