

SEMINARIO DE ANÁLISIS Y APLICACIONES

Viernes 13 de mayo,

11:00 h., Módulo 17 - Aula 520 (Depto. Matemáticas UAM)

ONLINE - URL: <https://researchseminars.org/seminar/SAA-UAM-ICMAT>

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Eigenvalue counting problems for the magnetic Schrödinger operator and their solutions via the Filoche-Mayboroda landscape function

Resumen:

In two papers in the 90's, Z. Shen studied non-asymptotic bounds for the eigenvalue counting function of the magnetic Schrödinger operator in a few settings. But in dimensions 3 or above, his methods required a strong scale-invariant assumption on the gradient of the magnetic field; in particular, this excludes many singular or irregular magnetic fields, and the questions of treating these later cases had remained open. This strong assumption on the gradient of the magnetic field has appeared also in the harmonic analysis related to the magnetic Schrödinger operator.

In this talk, we present our solutions to these questions, and other new results on the exponential decay of solutions (eigenfunctions, integral kernels, resolvents) to Schrödinger operators. We will introduce the Filoche-Mayboroda landscape function for the (non-magnetic) Schrödinger operator, present its pointwise equivalence to the classical Fefferman-Phong-Shen maximal function (also known as the critical radius function in harmonic analysis literature), and then show how one may use directionality assumptions on the magnetic field to construct a new landscape function in the magnetic case. We solve Shen's problems (and recover other results in the irregular setting) by putting these observations together.

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