

COLOQUIO DE ANÁLISIS Y FÍSICA–MATEMÁTICA

Organizers: *Doctors: Pablo Barberis, Rafael del Río, Luis O. Silva and Ricardo Weder*

GAP THEOREMS IN MIXED SPECTRAL PROBLEMS

Prof. Alexei Poltoratski
Texas A&M University

Abstract

A mixed spectral problem for Schroedinger equations asks if an operator can be recovered uniquely from partial information on the potential and spectrum. Every problem of this type quickly translates into a problem on uniqueness of holomorphic functions satisfying certain conditions.

In my talk I will discuss the translation mechanism and show how recent results in complex and harmonic analysis give new solutions for mixed spectral problems for Schroedinger equations and Dirac system.

13 de diciembre de 2016



SOJOURN TIME AND RESONANCES

Dr. Claudio Fernández
Pontificia Universidad Católica de Chile

Abstract

We show the relevance of the sojourn time in the characterization of the resonance phenomena in Quantum Mechanics. In particular, we show different techniques that provide upper and lower bounds for this quantity.

We also review Lavine's energy width and apply it to the study of resonant behaviour of time dependent quantum systems.

The concept of energy width can be used to estimate the spectral concentration of a quantum state. Also, combined with Mourre estimates, it can be used to obtain a simple way of estimating the sojourn time. Concrete examples will be discussed.

Above is a joint work with J. Asch (Marseille) and O. Bourget and V. Cortés (PUC).

6 de diciembre de 2016



SPECTRAL ANALYSIS OF A MODEL OF QUANTUM FRICTION

Dr. Baptiste Schubnel
SBB, Switzerland

Abstract

An otherwise free classical particle moving through an extended spatially homogeneous medium with which it may exchange energy and momentum will undergo a frictional drag force in the direction opposite to its velocity with a magnitude which is typically proportional to a power of its speed. We study here the spectral properties of the quantum equivalent of a classical Hamiltonian model for this friction phenomenon. Under suitable conditions on the infrared behaviour of the model, we prove that the Hamiltonian at fixed total momentum has no ground state except when the total momentum vanishes, and that its spectrum is otherwise absolutely continuous. This is joint work with S. de Bièvre and J. Faupin.

1 de abril de 2016