COLOQUIO DE ANÁLISIS Y FÍSICA–MATEMÁTICA

Organizers: Dr. Rafael del Río y Dr. Ricardo Weder

TIME–DOMAIN AND FREQUENCY–DOMAIN METHODS FOR INVERSE SCHRÖDINGER SCATTERING

Dr. Tuncay Aktosun
Mississippi State University

Abstract

We review various methods to recover the potential of the one–dimensional Schrödinger equation when that potential is real valued, integrable, has a finite first moment, has no bound states, and has support on the positive axis. We compare the time–domain and frequency–domain methods and explore the connections among them.

8 de diciembre de 2004.

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HIGH ENERGY AND SMOOTHNESS ASYMPTOTIC EXPANSION OF THE SCATTERING AMPLITUDE

Dr. Dimitri Yafaev
Université de Rennes–1

Abstract

We find an explicit expression for the kernel of the scattering matrix for the Schrödinger operator containing at high energies all terms of power order. It turns out that the same expression gives a complete description of the diagonal singularities of the kernel in the angular variables. The formula obtained is in some sense universal since it applies both to short –and long– range electric as well as magnetic potentials.

27 de octubre de 2004.

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TWO SHARP RESULTS IN SPECTRAL THEORY OF SCHRÖDINGER OPERATORS

Dr. Alexander Kiselev
Wisconsin University

Abstract

We will discuss two results on the spectrum of one–dimensional Schrödinger and Stark operators. First, we prove that for any potential decaying at the Coulomb rate, the singular continuous spectrum is empty, and so modified wave operators are asymptotically complete. Second, we show that Stark operators with rough periodic perturbations can have purely singular spectrum if the perturbation is in $H_{-1/2}$. On the other hand, it is known that if perturbation is in H_s with $s > 1/2$, the absolutely continuous spectrum fills the whole real axis.

11 de agosto de 2004.

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CAN YOU DETERMINE THE “SHAPE” OF A VOCAL TRACT

Dr. Tuncay Aktosun
Mississippi State University

Abstract

In this joint work with Roy Pike of King’s College of London and Barbara Forbes of Phonologica, London, we analyze the inverse problem of determining the scaled curvature of a human vocal tract. Mathematically, this problem is equivalent to finding the potential of the radial Schrödinger equation when the spatial derivative of the Jost solution is known at the origin.

19 de mayo de 2004.