

Abstract

Plenary

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Dissipative quantum systems: scattering theory and spectral singularities

Based on two articles. The first one is joint work with Jürg Fröhlich and the second one is joint work with François Nicoleau.

In this talk, we will consider an abstract pseudo-hamiltonian given by a dissipative operator of the form $H = H_V - iC^*C$, where $H_V = H_0 + V$ is self-adjoint and C is a bounded operator. Such operators are frequently used to study scattering theory for dissipative quantum systems. We will recall conditions implying the existence of the wave operators associated to H and H_0 , and we will see that they are asymptotically complete if and only if H has no spectral singularities embedded in its essential spectrum. In mathematical physics, spectral singularities have been considered in many different contexts. We will review several possible equivalent definitions of a spectral singularity. For dissipative Schrödinger operators, a spectral singularity corresponds to a real resonance, or, equivalently, to a point of the positive real axis where the scattering matrix is not invertible.