Resonances for Schrödinger Operators with Compactly Supported Potentials

P. D. Hislop
Mathematics Department
University of Kentucky
Lexington KY 40506-0027 USA

In joint work with T. Christiansen, we prove that the resonance counting functions for Schrödinger operators $H_V = -\Delta + V$ on $L^2(R^d)$, for $d \geq 2$, with generic, compactly-supported, real- or complex-valued potentials V, have the maximal order of growth d. For d *odd*, the resonance counting function is defined on the complex plane. For d *even*, the maximal order of growth is obtained for the resonance counting function on each sheet Λ_m, $m \in Z \backslash \{0\}$ of the logarithmic Riemann surface. We obtain these results by constructing a certain plurisubharmonic functions from the determinants of operators related to the S-matrix. We prove that the order of growth of the counting functions can be recovered from suitable estimates on these functions. We also construct an example in each even dimension of a bounded, compactly-supported potential having a resonance counting function bounded below by $C_m r^d$ on each sheet Λ_m, $m \in Z \backslash \{0\}$.