

Instability of absolutely continuous spectrum for dissipative differential operators and Hamiltonian systems

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We prove that for a large class of dissipative second-order differential operators and 2×2 canonical (Hamiltonian) systems on semi-axis the absolutely continuous subspace is trivial if the imaginary part of the operator is not in $L^1(\mathbb{R}_+)$. The class includes Schrödinger and Dirac operators, Jacobi matrices etc. This result is to be compared with the Deift-Killip theorem asserting that the absolutely continuous spectrum of the selfadjoint Schrödinger operator or Jacobi matrix with a potential from L^2 is the same as the one of the free-particle operator. Our theorems are sharp in the sense that if the imaginary part of the perturbation belongs to L^1 , then the absolutely continuous spectrum coincides with that of the real part of the operator by the abstract nuclear scattering theory of Sahnovich and Naboko.

References:

- [1] *Romanov R.* On instability of the absolutely continuous spectrum of dissipative Schrödinger operators and Jacobi matrices// *St. Petersburg Math. J.*, V. 17. 2006. P. 325–341.
- [2] *Romanov R. and Marletta M.* Absence of the absolutely continuous spectrum of a first-order non-selfadjoint Dirac-like system for slowly decaying perturbations// *Ark. Mat.*, V. 44. 2006. P. 132–148.

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