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Resolvent estimates for one-dimensional Dirac operators with imaginary potentials

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We consider one-dimensional Dirac operators on the real line with imaginary potentials unbounded at infinity. Lower resolvent norm estimates were obtained in [Nguyen-Krejcirik-22] via a (non-semiclassical) pseudomode construction for the spectral parameter diverging to infinity in various regions of the complex plane. Our results comprise upper resolvent norm estimates in the complementary regions; thereby establishing also an optimality of pseudospectral regions in [Nguyen-Krejcirik-22]. Our proofs are based in particular on a detailed analysis of the Airy-Dirac operator for which the precise asymptotic behavior of the resolvent norm is found.

The talk is based on a joint work with A. Arnal (Graz) and T. D. Nguyen (Prague).

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