

Generalized Airy Operators

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We study the simple non-self-adjoint operators of the form $A := -\partial_x + W(x)$ in $L^2(\mathbb{R})$ where the potential W is assumed to be even, non-negative and unbounded at infinity. We provide a sharp estimate for the norm of its resolvent as the spectral parameter diverges to $+\infty$ and determine the norm of the C_0 -semigroup generated by $-A$. Finally, we discuss the applications of the results in the asymptotic shape of pseudospectra of Schrödinger and damped wave operators and also the optimality of abstract resolvent bounds based on Carleman-type estimates.

The talk is based on a joint work with A. Arnal (QUB, Belfast).