Lower bounds for eigenvalue gaps and gradients of eigenfunctions for Hamiltonians with singular potentials

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This is a joint project with Sylwia Kondey.

We consider in two space dimensions the negative Laplacian with a singular potential supported on a finite curve. Under suitable conditions this Hamiltonian has (at least) two eigenvalues. We are intersted in lower bounds for the distance between the two lowest eigenvalues.

To derive this bound one is led to estimate certain gradients of eigenfunctions from below. This part of the proof of the lower spectral gap bound will be presented.