

Mathematical Physics

On geometric perturbations of critical Schrödinger operators with a surface interaction

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(Submitted on 9 Jan 2009)

We study singular Schrodinger operators with an attractive interaction supported by a closed smooth surface A in \mathbb{R}^3 and analyze their behavior in the vicinity of the critical situation where such an operator has empty discrete spectrum and a threshold resonance. In particular, we show that if A is a sphere and the critical coupling is constant over it, any sufficiently small smooth area preserving radial deformation gives rise to isolated eigenvalues. On the other hand, the discrete spectrum may be empty for general deformations. We also derive a related inequality for capacities associated with such surfaces.

Comments: 17 pages

Subjects: **Mathematical Physics (math-ph)**; Spectral Theory (math.SP); Quantum Physics (quant-ph)

MSC classes: 81V99

Cite as: [arXiv:0901.1148v1](#) [math-ph]

Submission history

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[v1] Fri, 9 Jan 2009 15:12:55 GMT (13kb)

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