

Approximation of quantum leaky graphs by point potentials

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In this work, quantum graphs are modeled by differential operators in $L^2(\mathbb{R}^2)$ with an attractive δ -potential supported by the graph. We show that these operators can be approximated in the strong resolvent sense by suitably chosen point-interaction Hamiltonians.

For the latter operators the spectral problem is easily solvable. Hence the operator approximation yields an alternative way how to calculate discrete spectra for potentials on finite graphs, at least numerically. The result is applied to a simple example: the graph is a circle.

Joint work with Pavel Exner.