

Convergence results for thick graphs

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Many physical systems have branching structure of thin transversal diameter. One can name for instance quantum wire circuits, thin branching waveguides, or carbon nano-structures. In applications, such systems are often approximated by the underlying one-dimensional graph structure, a so-called “quantum graph”. In this way, many properties of the system like conductance can be calculated easier (sometimes even explicitly). We give an overview of convergence results obtained so far, such as convergence of Schrödinger operators, Laplacians, their spectra and resonances, scattering matrices and Dirichlet-to-Neumann maps.