Spectral Convergence of Neumann Laplacian On Non-Compact Quasi-One-Dimensional Spaces and Some Geometric Domains

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Abstract: The talk is review of the paper of O.Post "Spectral Convergence of Quasi-One-Dimensional Spaces". We investigate a family of non-compact manifolds X_ε ("graph-like manifolds") approaching a metric graph X_0. We present the convergence results of the related the operators, namely the Neumann Laplacian Δ_{X_ε} and Δ_{X_0}. More precisely, we show that the pair of self-adjoint non-negative operators and Hilbertspaces $(\Delta_{X_\varepsilon}; L^2(X_\varepsilon))$ and $(\Delta_{X_0}; L^2(X_0))$ are close to each other. We also derive the norm convergence of the resolvents, spectral projections and eigenfunctions. As a consequence, the essential and the discrete spectrum converge as well. The convergence results will be given in works dealing with operators acting in different spaces, applicable also in other geometric situations.

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