

Shrinking fat graphs and convergence of operators and spectra

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A fat graph is a manifold or an open subset in Euclidean space that shrinks to a metric graph (a topological graph, where each edge is identified with an interval of a certain length). We consider Laplace-like operators on the thick graphs and analyse their behaviour under the shrinking limit. We give an overview of results leading to different limit operators on the metric graphs, so-called “quantum graphs” and how to generate different couplings at the vertices [2]. Details of the underlying convergence of operators acting in different Hilbert spaces is given in [1], as well as results on shrinking domains with standard vertex conditions in the limit.

References

- [1] *O. Post*: Spectral analysis on graph-like spaces. Lecture Notes in Mathematics 2039, Springer, 2012.
- [2] *P. Exner, O. Post*: A general approximation of quantum graph vertex couplings by scaled Schrödinger operators on thin branched manifolds, accepted in Comm. Math. Phys., 2013.