



## **Dr. Olaf Post**

# **Convergence results for almost one-dimensional spaces**

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We consider a family of noncompact, thin manifolds converging to a metric graph. The thin manifold can either be a thin neighbourhood of the (embedded) quantum graph or be defined as a manifold without boundary (like the surface of a pipeline network approaching the metric graph). We will present convergence results of the associated Laplacians on functions and 1-forms, including norm resolvent convergence, convergence of the spectrum and convergence of resonances.

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