Solomyak, Michael (IL-WEIZ)

On the spectrum of the Laplacian on regular metric trees. (English summary)
Special section on quantum graphs.


In this paper the author considers the Laplacian on regular metric trees with Kirchhoff boundary conditions at the vertices. Given a rooted tree we define the generation of a vertex, or edge, to be the number of vertices, or edges, between it and the root. A tree is regular if each vertex of a particular generation has the same degree and each edge of a particular generation has the same length. Using the symmetries of a regular tree a special decomposition of the Hilbert space on which the Laplacian acts is constructed. The author uses this decomposition to analyse the spectrum obtaining conditions for positive definiteness and discreteness along with a Weyl-type formula for the spectral asymptotics. Some examples are considered.

Reviewed by Mark Stuart Harmer

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