

# On the unitary equivalence between differential and finite-difference operators on graphs

K. Pankrashkin

We show that a certain function of the standard Laplacian on any equilateral metric graph is unitary equivalent to the discrete transition operator on the same graph. This allows one to describe some spectral properties of the metric graphs in terms of the combinatorial properties. We will see that this correspondence is just a particular case of a certain general result in the spectral theory of self-adjoint extensions in terms of boundary triples and generalizes some results of the inverse spectral theory for scalar-type Weyl functions proved in a paper by Albeverio, Brasche, Malamud, Neidhardt in 2005.