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Robert C Carlson* (carlson@math.uccs.edu), Department of Mathematics, University of Colorado at Colorado Springs, Colorado Springs, CO 80933. *Differential operators on graphs related to blood flow.*

Differential equations on graphs can serve as a basis for analytic and computational models of blood flow in the human arterial system. A significant issue is the geometric complexity of peripheral arterial subsystems, which have roughly 10^8 arterioles and 17 levels of branching. This work considers linear energy conserving models defined on radial trees. A reduction to radially symmetric functions facilitates the selection of appropriate junction conditions, the asymptotic analysis of solutions to eigenvalue equations at the ends of the tree, and the construction of operator domains, scattering matrices, and other elements of spectral analysis. (Received September 06, 2005)