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Matthew J Begue* (matthew.begue@uconn.edu), 52 Kate Lane, Tolland, CT 06084, and **Tristan Kalloniatis** and **Robert Strichartz**. *Harmonic functions and the spectrum of the Laplacian on the Sierpinski carpet*. Preliminary report.

Kusuoka and Zhou have defined the Laplacian on the Sierpinski carpet using average values of functions on small cells and the graph structure of cell adjacency. We have implemented an algorithm that uses their method to approximate solutions to boundary value problems. As a result we have a wealth of data concerning harmonic functions with prescribed boundary values, and eigenfunctions of the Laplacian with either Neumann or Dirichlet boundary conditions. We will present some of this data and discuss some ideas for defining normal derivatives on the boundary of the carpet. (Received August 03, 2010)