1062-46-260   **Alexander Teplyaev*** (`alexander.teplyaev@uconn.edu`), Department of Mathematics, University of Connecticut, Storrs, CT 06269. *Spectral analysis on infinite Sierpinski fractafolds.*

A fractafold, a space that is locally modeled on a specified fractal, is the fractal equivalent of a manifold. For compact fractafolds based on the Sierpiński gasket, it was shown by Strichartz how to compute the discrete spectrum of the Laplacian in terms of the spectrum of a finite graph Laplacian. A similar problem was solved for the case of infinite blowups of a Sierpiński gasket, where spectrum typically is pure point of infinite multiplicity (and sometimes also have a singularly continuous component). Both works used the method of spectral decimation to obtain explicit description of the eigenvalues and eigenfunctions. In this paper we combine the ideas from these earlier works to obtain a description of the spectral resolution of the Laplacian for noncompact fractafolds. Our main abstract results enable us to obtain a completely explicit description of the spectral resolution of the fractafold Laplacian. For some specific examples we turn the spectral resolution into a "Plancherel formula". We also present such a formula for the graph Laplacian on the 3-regular tree, which appears to be a new result of independent interest. In the end we discuss periodic fractafolds and fractal fields.

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