

CONDITIONS FOR LIPSCHITZ CONTINUITY ON POST-CRITICALLY FINITE
SELF-SIMILAR SETS

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Abstract of Poster Presentation: Kigami's theory of analysis on post-critically finite self-similar (pcfss) sets applies to many well-known fractals, such as the Sierpinski Gasket. In this theory, functions with Laplacian in L^1 are Lipschitz in an intrinsic metric called the resistance metric. However, there are other useful metrics on these sets: One fundamental example is the geodesic metric on the Sierpinski gasket in harmonic coordinates. One may recognize this fractal as a one-dimensional C^1 subset of \mathbb{R}^2 which carries a measurable Riemannian structure. By analyzing the self-similar structure of the Green's operator which inverts the Laplacian, we give sufficient conditions for the Lipschitz and Hölder continuity of functions with L^p Laplacian on pcfss sets endowed with measures and metrics from a general class that includes the Riemannian structure on the harmonic Sierpinski gasket; in particular, our results establish Lipschitz continuity of Laplacian eigenfunctions and the heat kernel in this setting.

[Joint work with Benjamin York]

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