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**Nishu Lal\*** ([nishul@math.ucr.edu](mailto:nishul@math.ucr.edu)), Department of Mathematics, University of California, Riverside, Riverside, CA 92521, and **Michel Lapidus** ([lapidus@math.ucr.edu](mailto:lapidus@math.ucr.edu)), Department of Mathematics, University of California, Riverside, Riverside, CA 92521. *Factorization of the spectral zeta function of differential operators on fractals.*

We investigate the factorization formula of the spectral zeta function of Laplacian-like operators on self-similar sets, in particular, those operators for which the decimation method is well established. We will consider the Sturm–Liouville operator on the half real line and C. Sabot’s work connecting the spectrum of this operator with the iteration of a rational map of several complex variables. The Sturm-Liouville operator on  $[0, \infty)$  is viewed as a limit of the sequence of operators  $\frac{d}{dm_{\langle n \rangle}} \frac{d}{dx}$  with Dirichlet boundary condition on  $I_{\langle n \rangle} = [0, \alpha^{-n}]$  which are the infinitesimal generators of the Dirichlet form  $(a_{\langle n \rangle}, m_{\langle n \rangle})$ . We obtain a factorization of the spectral zeta function expressed in terms of the zeta function associated with the dynamics of the corresponding renormalization map induced by the decimation method, viewed as a rational function on the complex projective plane  $\mathbb{P}^2(\mathbb{C})$ . Furthermore, we conclude by showing that a similar factorization formula exists for other fractals, including the infinite Sierpinski gasket. Joint work with M. Lapidus. (Received September 22, 2011)