Energy Forms on Random and Stretched Fractals

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In this talk, we recall the classical definition of the Laplacian on fractals by means of Dirichlet forms as it has been introduced by Kigami in the late 1980s. Our model case will be Sierpinski gasket, and we will present the corresponding Weyl asymptotics (obtained by Kigami and Lapidus in 1993, see [2]).

Then we present how these approaches can be applied to fractals where the assumption of strict self similarity is weakened. In particular, so called V–variable fractals (a certain class of statistically self similar fractals) and stretchted Sierpinski gaskets are considered.

The results presented in the talk have been obtained in collaboration with Ben Hambly (Oxford University) and John Hutchinson (ANU Canberra), see [1] – and Patricia Alonso Ruiz (Texas A&M University) and Jun Kigami (Kyoto University), see [3].

References

[1] U. Freiberg, B. M. Hambly, and John E. Hutchinson. "Spectral asymptotics for V-variable Sierpinski gaskets". English. In: *Ann. Inst. Henri Poincaré, Probab. Stat.* 53.4 (2017), pp. 2162–2213. ISSN: 0246-0203. DOI: 10.1214/16-AIHP787.

[2] Jun Kigami and Michel L. Lapidus. "Weyl's problem for the spectral distribution of Laplacians on P.C.F. self-similar fractals". English. In: *Commun. Math. Phys.* 158.1 (1993), pp. 93–125. ISSN: 0010-3616. DOI: 10.1007/BF02097233.

[3] Patricia Alonso Ruiz, Uta R. Freiberg, and Jun Kigami. "Completely symmetric resistance forms on the stretched Sierpiński gasket". English. In: *J. Fractal Geom.* 5.3 (2018), pp. 227–277. ISSN: 2308-1309. DOI: 10.4171/JFG/61.