The asymptotic behaviour of the eigenvalues of the Laplacian on irregular or random Cantor-like fractals

Peter Arzt

We construct a fractal as follows. From an interval $K_0 = [a, b]$ we remove a number of open intervals at random and denote the remaining set by K_1. We repeat the procedure with each of the remaining intervals, call the remaining set K_2, and so on. Then set $K = \bigcap_{i=0}^{\infty} K_i$.

Let μ be a finite Borel-measure on $[a, b]$ with support K. We define a derivative $\frac{df}{d\mu}$ with respect to μ and put $\Delta^\mu = \frac{d}{d\mu}\frac{d}{dt}$. The aim is to determine the asymptotic behaviour of the eigenvalue counting function N of Δ^μ.