Numerical Experiments in Fourier Asymptotics of Cantor Measures and Wavelets

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Abstract

We discuss the asymptotic behavior of Fourier transforms of Cantor measures and wavelets, and related functions that might be called multiperiodic because they satisfy a simple recursion relation involving a blend of additive and multiplicative structures.

Our numerical experiments motivated conjectures about this asymptotic behavior, some of which we can prove. We describe the experiments, the proofs, and several remaining conjectures and open problems. We also contribute to the evolving iconography of fractal mathematics by presenting the numerical evidence in graphical form.