Title: Packing dimension for 'exceptional' self-affine sets.

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Abstract

A nonempty compact set $F \subset \mathbb{R}^n$ is called self-affine if it is the attractor of an iterated function system consisting of maps of the form $S_i = A_i + t_i$, where A_i is a linear contraction and t_i is a translation. Studying the dimension of self-affine sets is a notoriously difficult problem, highlighted by the fact that the dimension need not be continuous with respect to the translations t_i, even in regions corresponding to strong separation. Given a finite set of linear contractions, $\{A_i\}$, with Lipschitz constants strictly less than 1/2, Falconer has given an asymptotic formula for the Hausdorff and packing dimension of F for almost all associated sets of translations. Several 'exceptional' classes of self-affine set have been considered over the past 25 years, which, due to the regularity of their construction, often have dimension strictly less than the almost sure value. Such classes have been introduced by Bedford-McMullen (1980s), Lalley-Gatzouras (1990s), Barański (2007), and Feng-Wang (2005), with increasing levels of generality and increasingly complicated expressions for the dimensions. In this talk we will introduce a new class of exceptional self-affine sets, which is more general than those mentioned above, and we will provide an asymptotic formula for the packing dimension. The aim here is not generality for generality's sake, but rather to attempt to unify the study of the exceptional constructions with Falconer's almost sure formula.