A central problem in fractal geometry is the dimension drop conjecture that states that a self-similar subset of $\mathbb{R}^1$ has Hausdorff dimension $\min\{s,1\}$, where $s$ is the similarity dimension, unless exact overlaps occur. A landmark article by M. Hochman [Ann. Math. (2) 180, No. 2, 773–822 (2014; Zbl 1337.28015)] resolved the dimension drop conjecture for self-similar sets whenever the cylinders are not super-exponentially close. Until recently, it was not known whether there even exist self-similar systems that are superexponentially close, yet have no exact overlap. Independently, the author of this article [Adv. Math. 379, Article ID 107548, 13 pp. (2021; Zbl 1457.28006)] as well as B. Bárány and A. Käenmäki [Adv. Math. 379, Article ID 107549, 23 p. (2021; Zbl 1461.28001)] proved their existence. The article under review is a follow up to the former publication and the author establishes a general sufficient condition (Theorem 2.1) under which a parametrized family of iterated function systems must contain an example of an iterated function system that has superexponentially close cylinders with no overlap.

Reviewer: Sascha Troscheit (Wien)

MSC:
28A80 Fractals
37C45 Dimension theory of smooth dynamical systems

Keywords:
overlapping iterated function systems; self-similar measures; exact overlaps; superexponential condensation

Full Text: DOI arXiv

References:

This reference list is based on information provided by the publisher or from digital mathematics libraries. Its items are heuristically matched to zbMATH identifiers and may contain data conversion errors. It attempts to reflect the references listed in the original paper as accurately as possible without claiming the completeness or perfect precision of the matching.