

1086-11-468

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*Intersections of Multiplicative Translates of 3-adic Cantor sets.*

Erdős raised the question of when the ternary expansion of  $3^n$  omits the digit 2. This is believed to happen finitely often, but seems intractable. We investigate the question of the Hausdorff dimension of the set of 3-adic integers  $\lambda$  having the property that infinitely many  $2^n\lambda$  omit the digit 2 in their 3-adic expansion. This leads to study of intersections of multiplicative translates of 3-adic Cantor sets  $S$  of the form  $S \cap MS$ , where  $M$  is an integer. The structure of such sets can be explicitly described in any individual case, and the Hausdorff dimension computed. We report on explicit examples, some infinite families that are analyzable, and obtain bounds relevant to the original question. (Received September 03, 2012)