

Title: Hausdorff dimension of level sets in Engel continued fraction

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Let $[[b_1(x), \dots, b_n(x), \dots]]$ be the Engel continued fraction expansion of $x \in (0, 1)$. This paper is concerned with the growth of the partial quotients $b_n(x)$. We obtain the Hausdorff dimension of the sets

$$E_\phi = \left\{ x \in (0, 1) : \lim_{n \rightarrow \infty} \frac{\log b_n(x)}{\phi(n)} = 1 \right\},$$

for any non-decreasing ϕ satisfying $\lim_{n \rightarrow \infty} (\phi(n+1) - \phi(n)) = \infty$ and $\lim_{n \rightarrow \infty} \phi(n+1)/\phi(n) = 1$.

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