LARGE SETS CONTAINING NO COPIES OF A GIVEN INFINITE SEQUENCE

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ABSTRACT. Let $\mathbb{A}$ be a discrete, unbounded, infinite set in $\mathbb{R}$. Can we find a "large" measurable set $E \subset \mathbb{R}$ which does not contain any affine copy $x + t\mathbb{A}$ of $\mathbb{A}$ (for any $x \in \mathbb{R}$, $t > 0$)?

If a_n is a real, nonnegative sequence that does not increase exponentially, then, for any $0 \le p < 1$, we construct a Lebesgue measurable set which has measure at least p in any unit interval and which contains no affine copy of the given sequence. We generalize this to higher dimensions and also for some "non-linear" copies of the sequence. Our method is probabilistic.

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