Translation-finite sets of positive integers

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Abstract

This talk is based on some old work with M. J. Heath. Given a set E of positive integers, one can consider its backward translates $E-1, E-2, E-3$, etc. We say E is a TF-set if, whenever we take an infinite sequence of distinct translates $E-n_1, E-n_2, E-n_3$, ... there is some k such that the intersection of the first k elements of this sequence is finite. Obvious obstructions to the TF property are infinite arithmetic progressions; in the other direction, it is not hard to prove that set of square numbers is TF.

I will explain how Heath and I came to be thinking about TF-sets, motivated by the study of derivations on a certain Banach algebra, and present some examples and observations. No prior knowledge of, or interest in, Banach algebras is assumed. If time permits I will say something about how TF sets arose in older work of Ruppert concerning the WAP compactification of N.