

Additive Combinatorics
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Subsets of F_q with the minimal number of three-term arithmetic progressions

Ernie Croot
ecroot@math.gatech.edu
School of Mathematics
Georgia Institute of Technology
125 Skiles
Atlanta, GA 30332
USA

Abstract

An interesting and central problem in arithmetic combinatorics is to determine how many k -term arithmetic progressions a given subset of the finite field F_q contains. Even the case of three-term arithmetic progressions is interesting and leads to many unsolved (and perhaps unsolvable?) problems. One such problem is to determine the minimal number of three-term progressions a subset of a given density can contain. In this talk I will not solve this problem, but will state and prove a structure theorem on such sets with the minimal number of 3APS.