GREG MARTIN, Department of Mathematics, University of British Columbia, Vancouver, British Columbia V6T 1Z2

Sidon sets and symmetric sets of real numbers

A set S of integers is called a $B^*[g]$ *set* if for any given m there are at most g ordered pairs $(s_1, s_2) \in S \times S$ with $s_1 + s_2 = m$; in the case $g = 2$, these are better known as Sidon sets. It is trivial to show that any $B^*[g]$ set contained in $\{1, 2, \ldots, n\}$ has at most $\sqrt{2gn}$ elements, but proving a lower bound of the same order of magnitude is more difficult. This problem, surprisingly, is intimately related to the following problem concerning measurable subsets of the real numbers: given $0 < \varepsilon < 1$, estimate the supremum of those real numbers δ such that every subset of $[0, 1]$ with measure ε contains a symmetric subset with measure δ. Using harmonic analysis and relationships among L^p norms as well as methods from combinatorial and probabilistic number theory, we establish fairly tight upper and lower bounds for these two interconnected problems.