Combinatorics
Seminar

Infinite Sidon sets contained in sparse random sets of integers

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Abstract: A set S of natural numbers is a *Sidon* set if all the sums $s_1 + s_2$ with s_1, $s_2 \in S$ and $s_1 \le s_2$ are distinct. Let constants $\alpha > 0$ and $0 < \delta < 1$ be fixed, and let $p_m = \min\{1, \alpha m^{-1+\delta}\}$ for all positive integers m. Generate a random set $R \subset \mathbb{N}$ by adding m to R with probability p_m, independently for each m. We investigate how dense a Sidon set S contained in R can be. Our results show that the answer is qualitatively very different in at least three ranges of δ. We prove quite accurate results for the range $0 < \delta \le 2/3$, but only obtain partial results for the range $2/3 < \delta \le 1$.

This is joint work with Yoshiharu Kohayakawa and Vojtech Rodl.

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