On Marton's conjecture

Let A be a subset of V, a vector space over the finite field with two elements. Suppose that $|A+A| \leq K|A|$ for some constant K, where $A+A$ denotes the sumset $\{a_1+a_2 : a_1, a_2 \in A\}$. Katalin Marton conjectured that A is efficiently covered by cosets of subspaces of V; more precisely, there are cosets $H_1, \ldots, H_m$ of size at most $|A|$ whose union covers A, where m is bounded polynomially in terms of K. This conjecture was popularised by Imre Ruzsa and became a well-known open problem in additive combinatorics.

I will discuss the recent proof of Marton's conjecture, which was given in joint work with Tim Gowers, Freddie Manners and Terence Tao.

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