Maximum hypergraphs without regular subgraphs

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Abstract

We show that an n-vertex hypergraph with no r-regular subgraphs has at most $2^{n-1} + r - 2$ edges. We conjecture that if $n > r$, every n-vertex hypergraph with no r-regular subgraphs with maximum number of edges contains a star, that is a hypergraph with all edges containing an element. We prove this conjecture for $n \geq 425$. This is joint work with Alexandr V. Kostochka.