

1039-05-55

Zoltan Füredi* (z-furedi@math.uiuc.edu), Dept. Mathematics, 1409 W Green Street, Urbana, IL 61801. *Unavoidable subhypergraphs beyond the EKR bound.*

Let $\mathbf{a} = (a_1, a_2, \dots, a_p)$ be a sequence of positive integers, its sum is k . The system of k -element sets $\{F_0, F_1, \dots, F_p\}$ is called an \mathbf{a} -cluster if

- their union has $2k$ elements,
- $|F_i \setminus F_0| = a_i$ (consequently these sets are disjoint outside F_0), and
- every element of F_0 belongs to exactly p of these sets (i.e., the sets $F_0 \setminus F_i$ form a partition of F_0).

Suppose that \mathcal{F} is a k -uniform hypergraph on n vertices, $|\mathcal{F}| > \binom{n-1}{k-1}$ and n is sufficiently large (with respect to k), and suppose that $\mathbf{a} \neq (1, \dots, 1)$. We **conjecture** that \mathcal{F} must contain an \mathbf{a} -cluster. We prove the case when all $a_i \geq 2$ with $\max a_i > 2$.

The case $p = 1$ corresponds to the Erdős-Ko-Rado theorem, in the case $p = k$ (i.e, $a_1 = \dots = a_k = 1$) the threshold (in general) is slightly larger, it is $\binom{n}{k-1}$.

This is a strengthening of earlier results by Katona, Frankl and Füredi, and most recently by Mubayi, Keevash and Ramadurai. Most of the new results presented are joint with L. Özkahya. (Received March 03, 2008)