

An Intersection Theorem with Small Unions

Lale Özkahya

University of Illinois at Urbana-Champaign

ozkahya@uiuc.edu

(joint work with Zoltán Füredi)

Suppose that \mathcal{F} is a family of k subsets of an n -set, $\mathcal{F} \subseteq \binom{[n]}{k}$, $n \geq k \geq 3$, where $[n] = \{1, 2, \dots, n\}$. A d -cluster is a set of d members of \mathcal{F} with an empty intersection and with union of size at most $2k$. We prove a conjecture of Mubayi for sufficiently large n . (D. Mubayi, Erdős-Ko-Rado for three sets, J. Combin. Theory Ser. A, 113 (3) (2006) 547-550.) It is shown that for $2 \leq d \leq k$ and $n > n_0(k)$ if the k -uniform set system \mathcal{F} contains no d -cluster, then $|\mathcal{F}| \leq \binom{n-1}{k-1}$. With a different method we also settle the case $d = k + 1$ for all n .

MSC2000: 05B07, 05B40.

Keywords: Set systems, Intersecting families.