Abstract

A Hilton-Milnor theorem for vector spaces, and the chromatic number of q-Kneser graphs

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We show that if $q \geq 3$, $k \geq 3$ and $n \geq 2k+1$, then any intersecting family $\mathcal{F}$ of k-subspaces of an n-dimensional vector space over $GF(q)$ with $\bigcap_{F \in \mathcal{F}} F = \{\underline{0}\}$ has size at most $\left[{n-1 \atop k-1}\right] - q^{k(k-1)}\left[{n-k-1 \atop k-1}\right] + q^k$. This bound is sharp as shown by Hilton-Milner-type families. As an application of this result, we determine the chromatic number of q-Kneser graphs.

(joint work with A.E. Brouwer, A. Chowdhury, P. Frankl,T. Mussche, B. Patkós and T. Szőnyi)