

A Linear Analogue of Kneser's Theorem and Related Problems

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A theorem of Kneser in additive combinatorics states that in an abelian group G if A and B are finite subsets in G and $AB = \{ab \mid a \in A, b \in B\}$ then $|AB| \geq |A| + |B| - |H(AB)|$, where $H(AB) = \{g \mid g \in G, g(AB) = AB\}$. More than a decade ago, motivated by the study of a problem about finite fields, we (jointly with Xiang-Dong Hou and Ka Hin Leung) proved an analogous result for vector spaces over a field E in an extension field K of E , which is now called a linear analogue of Kneser's theorem. This linear analogue has found some interesting applications and motivated further investigations. We will talk about this linear analogue of Kneser's theorem and related problems.