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COMBINATORICS
SEMINAR

Erdos-Ko-Rado-type colorings of systems of sets or linear spaces

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Abstract: For a family F of r-sets in an n-sets elements, weconsider colorings of F with k colors such that each two r-sets in F of the same color mustintersect in at least ℓ vertices,$\ell < r$. In particular, we are interested in the structure of suchfamilies that maximize these number of colorings. It turns out that for $k = 2$ or $k = 3$ colors, the solution of this problem is related to the Erdos-Ko-Rado theorem (or the Turán number of the corresponding uncolored problem). Also the caseof more than 3 colors will be discussed. Moreover, we address a q-analogue of this question, i.e.,the intersection of each two linear r-subspaces of the same color in afamily F must have dimension at least ℓ.

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