Non-opposite sets of flags in geometries over finite fields

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Abstract

In 1938, Erdős, Ko and Rado proved a foundational result on the size of intersecting families of sets. Ever since, there has been a rich body of results proving similar theorems in different contexts. Notably, in geometries over finite fields like projective and polar spaces, such results were obtained by several groups of researchers. I will explain a very successful technique that can be used to prove these results, and indicate its shortcomings. We will show how a generalization of this problem recovers all known results and how algebraic combinatorics such as Iwahori-Hecke algebras and their representations come into play. The latter is based on joint work with Jan De Beule and Klaus Metsch.