Mathematics > Combinatorics

Intersecting Families of Permutations

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A set of permutations \$I \subset S_n\$ is said to be {\em k-intersecting} if any two permutations in \$I\$ agree on at least \$k\$ points. We show that for any \$k \in \mathbb{N}\$, if \$n\$ is sufficiently large depending on \$k\$, then the largest \$k\$-intersecting subsets of \$S_n\$ are cosets of stabilizers of \$k\$ points, proving a conjecture of Deza and FrankI. We also prove a similar result concerning \$k\$-cross-intersecting subsets. Our proofs are based on eigenvalue techniques and the representation theory of the symmetric group.

Comments: An expanded version (with slightly more detail and an added open problems section added) of a paper written in late 2008, previously available from the authors' webpages
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