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A generalization of the Erdős–Ko–Rado Theorem on permutations

Results analogous to the Erdős–Ko–Rado (EKR) theorem hold true for a wide range of mathematical objects that possess a notion of intersection. Among these is the analogue on permutations, characterizing the size and structure of maximum-sized families of pairwise intersecting permutations. Permutations $\sigma, \tau \in \mathrm{Sym}(n)$ are said to *intersect* if $\sigma^{-1}\tau$ fixes a point in $[n] := \{1, \ldots, n\}$. In this talk, we relax the definition of intersection and yet find that an analogue of EKR holds. Permutations $\sigma, \tau \in \mathrm{Sym}(n)$ are said to $\{1,2\}$-faux-intersect if either $\sigma^{-1}\tau$ fixes a point in $[n]$, or $\{\sigma^{-1}\tau(1), \sigma^{-1}\tau(2)\} \cap \{1,2\} \neq \emptyset$. We prove an EKR analogue for families of maximum-sized pairwise $\{1,2\}$-faux-intersecting permutations.