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The Erdős-Ko-Rado theorem for 2-intersecting families of perfect matchings

The *Erdős-Ko-Rado* (EKR) theorem is a classical result in extremal combinatorics. It states that if n and k are such that $n \geq 2k$, then any intersecting family $\mathcal{F}$ of k-subsets of $[n] = \{1, 2, \ldots, n\}$ has size at most $\binom{n-1}{k-1}$. Moreover, if $n > 2k$, then equality holds if and only if $\mathcal{F}$ is a *canonical* intersecting family; that is, $\bigcap_{A \in \mathcal{F}} A = \{i\}$, for some $i \in [n]$.

The EKR theorem can be extended to various combinatorial objects. In this presentation, I will talk about an extension of the EKR theorem to 2-intersecting families of perfect matchings. In particular, I prove that any 2-intersecting family of perfect matchings of K_{2k} has size at most $(2k-5) \times (2k-7) \times \ldots 3 \times 1$, for any $k \geq 3$.