Abstract

Intersecting families of set partitions

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A set partition of $[n] = \{1, \ldots, n\}$ is a collection of disjoint non-empty subsets of $[n]$ (which are called blocks) such that their union is $[n]$. A family of set partitions is said to be *intersecting* if any two members of this family have at least one common block.

Let $B(2k, 2)$ denote the family of all set partitions of $[2k]$ into blocks of size 2. We determine completely the structure of intersecting families of maximal size in $B(2k, 2)$, namely we show that any such family must consist of all partitions containing a fixed block. We also explore the connection between intersecting families in $B(2k, 2)$ and one-factorization of complete graphs.