Permutation Arrays and a New Block Design

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A permutation array PA is set of permutations on the same set, say of size n. Let $M(n,d)$ be the maximum size of a PA with Hamming distance at least d. We apply a contraction operation to the groups $AGL(1,q)$ and $PGL(2,q)$ where q is a prime power. In order to make large permutation arrays we study contraction graphs and their independent sets. We show that they can be found using a new block design. This technique allows us to produce many new lower bounds for $M(n,d)$.

Keywords: permutation arrays, Hamming distance, independent sets