

Some Erdős-Ko-Rado results for linear and affine groups of degree two*

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Abstract

In this paper, we show that both the general linear group $GL(2, q)$ and the special linear group $SL(2, q)$ have both the EKR property and the EKR-module property. This is done using an algebraic method; a weighted adjacency matrix for the derangement graph for the group is found and Hoffman's ratio bound is applied to this matrix. We also consider the group $AGL(2, q)$ and the 2-intersecting sets in $PGL(2, q)$.

Keywords: derangement graph, independent sets, Erdős-Ko-Rado Theorem, Symmetric group, General linear group, Affine linear group, Projective linear group

Math. Subj. Class.: Primary 05C35; Secondary 05C69, 20B05

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Nekaj rezultatov Erdős-Ko-Radovega tipa za linearne in afine grupe stopnje dve*

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Povzetek

V tem članku pokažemo, da imata tako splošna linearna grupa $GL(2, q)$ kot tudi posebna linearna grupa $SL(2, q)$ lastnost EKR in EKR-modulsko lastnost. To storimo z uporabo algebrائيčne metode; poiščemo uteženo matriko sosednosti grafa premestitev (t.j. permutacij brez negibnih točk) grupe in za to matriko uporabimo Hoffmanovo razmerje. Obravnavamo tudi grupo $AGL(2, q)$ ter 2-presečne množice v $PGL(2, q)$.

Ključne besede: Graf premestitev, neodvisne množice, Erdős-Ko-Radov izrek, simetrična grupa, splošna linearna grupa, afina linearna grupa, projektivna linearna grupa.

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