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An algebraic proof of the Erdős-Ko-Rado theorem for intersecting families of perfect matchings

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Abstract: In this paper we give a proof that the largest set of perfect matchings, in which any two contain a common edge, is the set of all perfect matchings that contain a fixed edge. This is a version of the famous Erdős-Ko-Rado theorem for perfect matchings. The proof given in this paper is algebraic, we first determine the least eigenvalue of the perfect matching derangement graph and then use properties of the perfect matching polytope to prove the result.

Keywords: Perfect matching derangement graph, independent sets, Erdős-Ko-Rado theorem.

Math. Subj. Class.: 05C35, 05C69

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Algebraičen dokaz Erdős-Ko-Radovega izreka za zanimive družine popolnih prirejanj

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Povzetek: V tem članku podamo dokaz, da je največja množica popolnih prirejanj, v kateri poljubni dve vsebujeta skupno povezavo, množica vseh popolnih prirejanj, ki vsebujejo neko fiksno povezavo. To je različica slavnega Erdős-Ko-Radovega izreka za popolna prirejanja. Naš dokaz je algebraičen, najprej določimo najmanjšo lastno vrednost grafa prerazporeditev popolnih prirejanj, potem pa uporabimo lastnosti politopa popolnih prirejanj, da dokažemo naš rezultat.

Ključne besede: Popolno prirejanje, graf prerazporeditev prirejanj, neodvisne množice, Erdős-Ko-Radov izrek.

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