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## 2-Arc-Transitive regular covers of $K_{n,n} - nK_2$ with the covering transformation group $\mathbb{Z}_p^2$

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**Abstract:** In [*J. Algebra. Combin.* 39 (2014)], 2014, Xu and Du classified all regular covers of a complete bipartite graph  $K_{n,n}$  minus a matching, denoted by  $K_{n,n} - nK_2$ , whose covering transformation group is cyclic and whose fibre-preserving automorphism group acts 2-arc-transitively. In this paper, a further classification is achieved for all the regular covers of  $K_{n,n} - nK_2$ , whose covering transformation group is isomorphic to  $\mathbb{Z}_p^2$  with  $p$  a prime and whose fibre-preserving automorphism group acts 2-arc-transitively. Actually, there are only few covers with these properties and it is shown that all of them are covers of  $K_{4,4} - 4K_2$ .

**Keywords:** Arc-transitive graph, covering graph, 2-transitive group.

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## 2-ločno-tranzitivni regularni krovi $K_{n,n} - nK_2$ s krovno transformacijsko grupo $\mathbb{Z}_p^2$

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**Povzetek:** V [*J. Algebra. Combin.* 39 (2014)], 2014, sta Xu in Du klasificirala vse regularne krove polnega dvodelnega grafa  $K_{n,n}$ , zmanjšanega za eno prirejanje, označenega s  $K_{n,n} - nK_2$ , katerega krovna transformacijska grupa je ciklična in na katerem grupa avtomorfizmov, ki ohranja vlakna, deluje 2-ločno-tranzitivno. V tem članku posplošimo klasifikacijo na vse regularne krove  $K_{n,n} - nK_2$ , katerih grupa krovnih transformacij je izomorfna  $\mathbb{Z}_p^2$ , kjer je  $p$  praštevilo, in na katerih grupa avtomorfizmov, ki ohranja vlakna, deluje 2-ločno-tranzitivno. Dejansko obstaja le malo krovov s temi lastnostmi in vsi takšni krovi so krovi grafa  $K_{4,4} - 4K_2$ .

**Ključne besede:** Ločno-tranzitiven graf, krovni graf, 2-tranzitivna grupa.

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