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Flag-transitive automorphism groups of 2-designs with $\lambda \geq (r, \lambda)^2$ and an application to symmetric designs*

Shenglin Zhou[†], Xiaoqin Zhan[‡]

*School of Mathematics, South China University of Technology,
Guangzhou 510641, P.R. China*

Abstract: Let \mathcal{D} be a 2 -(v, k, λ) design with $\lambda \geq (r, \lambda)^2$. If $G \leq \text{Aut}(\mathcal{D})$ is flag-transitive, then G cannot be of simple diagonal or twisted wreath product type, and if G is product type then the socle of G has exactly two components and G has rank 3. Furthermore, we prove that if \mathcal{D} is symmetric, then G must be an affine or almost simple group.

Keywords: 2-design, automorphism group, primitivity, flag-transitivity.

Math. Subj. Class.: 05B05, 05B25, 20B25

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[†]Corresponding author.

[‡]*E-mail addresses:* slzhou@scut.edu.cn (Shenglin Zhou), zhanxiaoqinshuai@126.com (Xiaoqin Zhan).

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Praporno-tranzitivne grupe avtomorfizmov 2-načrtov z $\lambda \geq (r, \lambda)^2$ in aplikacija na simetrične načrte[§]

Shenglin Zhou[¶], Xiaoqin Zhan^{||}

*School of Mathematics, South China University of Technology,
Guangzhou 510641, P.R. China*

Povzetek: Naj bo \mathcal{D} 2- (v, k, λ) načrt z $\lambda \geq (r, \lambda)^2$. Če je $G \leq \text{Aut}(\mathcal{D})$ praporno-tranzitiven, potem G ne more biti enostavno diagonalnega ali zasukanega venčno produktnega tipa, in če je G produkten tip, potem ima sokl od G natančno dve komponenti, G pa ima rang 3. Pokažemo še: če je \mathcal{D} simetričen, potem mora biti G afina ali skoraj enostavna grupa.

Ključne besede: 2-načrt, grupa avtomorfizmov, primitivnost, praporna-tranzitivnost.

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[¶] Kontaktni avtor.

^{||} *e-poštni naslovi:* slzhou@scut.edu.cn (Shenglin Zhou), zhanxiaoqinshuai@126.com (Xiaoqin Zhan).