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ON SYLOW 2-SUBGROUPS OF SHUNKOV GROUPS SATURATED WITH THE GROUPS $L_3(2^m)$

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A group G is saturated with groups from a set of groups X if any finite subgroup of G is contained in a subgroup of G isomorphic to some group from X. If all finite-order elements of a group G are contained in a periodic subgroup of G, then this subgroup is called the periodic part of G. A group G is called a Shunkov group if, for any finite subgroup H of G, any two conjugate elements of prime order in the quotient group $N_G(H)/h$ generate a finite group. A Shunkov group may have no periodic part. We establish the structure of a Sylow 2-subgroup of a Shunkov group saturated with projective special linear groups of degree 3 over finite fields of even characteristic in the case when the Shunkov group has no periodic part.

Keywords: group saturated with a given set of groups, Shunkov group, periodic part of a group.

REFERENCES

1. Ditsman A.P. On the center of p-groups. *Proc. seminar on group theory.* Moscow, 1938. P. 30–34.
2. Kargapolov M.I., Merzliakov Ju.I. *Fundamentals of the theory of groups.* N Y; Heidelberg; Berlin: Springer-Verlag, 1979, 203 p. ISBN: 978-1-4612-9966-0 . Original Russian text (3rd ed.) published in Kargapolov M.I., Merzlyakov Yu.I. *Osnovy teorii grupp.* Moscow: Nauka Publ., 1982, 288 p.
3. Kondrat'ev A.S. *Gruppy i algebry Li* [Lie groups and Lie algebras]. Ekaterinburg: UrO RAN Publ., 2009, 309 p. ISBN: 978-5-7691-2111-1 .
4. Lytkina D.V., Mazurov V.D. Periodic groups saturated with $L_3(2^m)$. *Algebra Logic*, 2007, vol. 46, no. 5, pp. 330–340. doi: 10.1007/s10469-007-0033-z .
5. Senashov V.I., Shunkov V.P. *Gruppy s usloviyami konechnosti* [Groups with finiteness conditions]. Novosibirsk: SO RAN Publ., 2001, 336 p. ISBN: 5-7692-0439-7 .
6. Cherep A.A. Set of elements of finite order in a biprimitively finite group. *Algebra Logic*, 1987, vol. 26, no. 4, pp. 311–313. doi 10.1007/BF01980245 .
7. Shlepkin A.A. On Shunkov groups, saturated with linear and unitary groups of dimension 3 over fields of odd orders. *Sib. Elektron. Mat. Izv.*, 2016, vol. 13, pp. 341–351 (in Russian). doi: 10.17377/semi.2016.13.029 .
8. Shlepkin A.K. Conjugately biprimitive finite groups containing finite unsolvable subgroups. In: *Abstracts. III Internat. Conf. on Algebra* (Krasnoyarsk, 1993), p. 369 (in Russian).
9. Shlepkin A.K. On conjugately biprimitively finite groups saturated with finite simple subgroups. *Algebra Logic*, 1998, vol. 37, no. 2, pp. 127–138. doi: 10.1007/BF02671597 .
10. Shlepkin A.K. Conjugately biprimitively finite groups with the primary minimal condition. *Algebra Logic*, 1983, vol. 22, no. 2, pp. 165–169. doi: 10.1007/BF01978669 .

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