

**NONSPLIT EXTENSIONS  
OF ABELIAN  $p$ -GROUPS BY  $L_2(p^n)$   
AND GENERAL THEOREMS ON EXTENSIONS  
OF FINITE GROUPS**

*V. P. Burichenko*

Let a group  $\tilde{G}$  be a nonsplit extension of an elementary Abelian  $p$ -group  $V$  by the group  $G = L_2(p^n)$  such that the action of  $G$  on  $V$  is irreducible. In the present article, we classify (up to isomorphism) such groups  $\tilde{G}$  with  $p^n \neq 3^4$ .

The main part of the article consists of proofs of numerous general assertions on representations, cohomologies, and extensions of finite groups. Further, we use these results in our study of extensions by  $L_2(q)$ .

*Key words and phrases:* finite simple groups, cohomologies, nonsplit extensions.

*Burichenko Vladimir Petrovich*

Institute of Mathematics of  
NAS of Belarus,  
Gomel, 246000 Belarus.  
E-mail: vpburich@gmail.com

Received

November 23, 2012

Translated into English:

*Siberian Advances in Mathematics*, V. 25, N 2, 77–109 (2015).

DOI: 10.3103/S1055134415020017