

MSC: 20G05, 20C33

DOI: 10.21538/0134-4889-2023-29-1-280-287

## TO THE MEMORY OF IRINA DMITRIEVNA SUPRUNENKO

V. I. Yanchevskii, A. S. Kondrat'ev, T. S. Busel, A. A. Osinovskaya

The paper presents the research of Irina Dmitrievna Suprunenko, a prominent specialist in the representation theory of algebraic groups and finite groups of Lie type.

Keywords: Irina Dmitrievna Suprunenko, algebraic group, finite group of Lie type, representation.

### REFERENCES

1. Suprunenko I.D. *The minimal polynomials of unipotent elements in irreducible representations of the classical groups in odd characteristic*. Memoirs Amer. Math. Soc., 2009. Vol. 200, no. 939. 154 p. doi: 10.1090/memo/0939.
2. Suprunenko I.D. Irreducible representations of simple algebraic groups containing matrices with big Jordan blocks. *Proc. London Math. Soc.*, 1995, vol. 71, no. 2, pp. 281–332. doi: 10.1112/plms/s3-71.2.281.
3. Suprunenko I.D. The minimal polynomials of unipotent elements in irreducible representations of the special linear group. *Acta Appl. Math.*, 1998, Vol. 52, no. 1-3, pp. 325–330. doi: 10.1023/A:1005912620357.
4. Suprunenko I.D. Identification of classical algebraic groups with the aid of matrices with big Jordan blocks *Dokl. NAN Belarusi*, 2001, vol. 45, no. 4, pp. 27–30 (in Russian).
5. Suprunenko I.D. Minimal polynomials of elements of order  $p$  in irreducible representations of Chevalley groups over fields of characteristic  $p$ . *Siberian Advances in Math.*, 1996, vol. 6, no. 4, pp. 97–150.
6. Suprunenko I. D. Unipotent elements of nonprime order in representations of the classical algebraic groups: two big Jordan blocks. *J. Math. Sci. (N. Y.)*, 2014, vol. 199, no 3, pp. 350–374. doi: 10.1007/s10958-014-1863-6.
7. Busel T.S., Suprunenko I.D., Testerman D. The minimal polynomials of unipotent elements of non-prime order in irreducible representations of the exceptional algebraic groups in some good characteristics. *Dokl. NAN Belarusi*, 2019, vol. 63, no. 5, pp. 519–525. doi: 10.29235/1561-8323-2019-63-5-519-525
8. Suprunenko I.D. Minimal polynomials of the images of the unipotent elements of non-prime order in the irreducible representations of an algebraic group of type  $F_4$ . *Dokl. NAN Belarusi*, 2022, vol. 66, no. 3, pp. 269–273. doi: 10.29235/1561-8323-2022-66-3-269-273.
9. Velichko M.V., Suprunenko I.D. Small quadratic elements in representations of the special linear group with large highest weights, *J. Math. Sci. (N. Y.)*, 2007, vol. 147, no. 5, pp. 7021–7041. doi: 10.1007/s10958-007-0527-1.
10. Osinovskaya A.A., Suprunenko I.D. On the Jordan block structure of images of some unipotent elements in modular irreducible representations of the classical algebraic groups. *J. Algebra*, 2004, vol. 273, no. 2, pp. 586–600. doi: 10.1016/j.jalgebra.2003.06.001.
11. Osinovskaya A. A., Suprunenko I. D. The block structure of unipotent elements from naturally embedded subgroups of type  $A_3$  in special modular representations of groups of type  $A_n$ . *Dokl. National'noi akademii nauk Belarusi*, 2007, Vol. 51, no 6, pp. 25–29 (in Russian).
12. Osinovskaya A.A., Suprunenko I.D. Unipotent elements from subsystem subgroups of type  $A_3$  in representations of the special linear group (in Russian). *Dokl. National'noi akademii nauk Belarusi*, 2012, Vol. 56, no 4, pp. 11–15.

13. Busel T.S., Suprunenko I.D. The block structure of the images of regular unipotent elements from subsystem symplectic subgroups of rank 2 in irreducible representations of symplectic groups. I–III. I — *Siberian Advances in Mathematics*, 2020, vol. 30, no. 1, pp. 1–20. doi: 10.3103/S1055134420010010; II — *Siberian Advances in Mathematics*, 2020, vol. 30, no. 4, pp. 229–274. doi: 10.1134/S105513442004001X; III — *Siberian Advances in Mathematics*, 2021, vol. 31, no. 2, pp. 112–130. doi: 10.1134/S1055134421020024
14. Suprunenko I.D. On the block structure of regular unipotent elements from subsystem subgroups of type  $A_1 \times A_2$  in representations of the special linear group. *J. Math. Sci. (N. Y.)*, 2012, Vol. 183, no. 5, pp. 715–726. doi: 10.1007/s10958-012-0835-y
15. Suprunenko I. D. Subgroups of  $GL(n, p^m)$  containing  $SL(2, p)$  in an irreducible representation of degree  $n$ . I. *Vestsi Acad. Navuk BSSR. Ser. fiz.-mat. navuk*, 1979, no. 1, pp. 18–24 (in Russian).
16. Suprunenko I. D. Subgroups of  $GL(n, p^m)$  containing  $SL(2, p)$  in an irreducible representation of degree  $n$ . II. *Vestsi Acad. Navuk BSSR. Ser. fiz.-mat. navuk*, 1979, no. 2, pp. 11–16 (in Russian).
17. Suprunenko I.D. Preservation of systems of weights of irreducible representations of an algebraic group and a Lie algebra of type  $A_l$  with bounded higher weights in reduction modulo  $p$ . *Vestsi Acad. Navuk BSSR, Ser. Fiz.-Mat. Navuk*, 1983, no. 2, pp. 18–22 (in Russian).
18. Zalesskii A. E., Suprunenko I. D. Reduced symmetric powers of natural realizations of the groups  $SL_m(P)$  and  $Sp_m(P)$  and their restrictions to subgroups. *Siberian Math. J.*, 1990, vol. 31, no. 4, pp. 555–566. doi: 10.1007/BF00970625.
19. Brundan J., Kleshchev A.S., Suprunenko I.D. Semisimple restrictions from  $GL(n)$  to  $GL(n-1)$ . *J. Reine und Angew. Math.*, 1998, vol. 1998, no. 500, pp. 83–112. doi: 10.1515/crll.1998.072.
20. Suprunenko I.D., Zalesskii A.E. On restricting representations of simple algebraic groups to semisimple subgroups with two simple components. *Trudy Instituta Matematiki*, 2005, vol. 13, no 2, pp. 109–115.
21. Suprunenko I.D. Special composition factors in restrictions of representations of special linear and symplectic groups to subsystem subgroups with two simple components. *Trudy Instituta matematiki*, 2018, vol. 26, no. 1, pp. 115–133.
22. Baranov A.A., Suprunenko I.D. Branching rules for modular fundamental representations of symplectic groups. *Bull. London Math. Soc.*, 2000, vol. 32, no. 4, pp. 409–420. doi: 10.1112/S002460930000727X.
23. Baranov A.A., Osinovskaya A.A., Suprunenko I.D. Modular representations of the special linear groups with small weight multiplicities. *J. Algebra*, 2014, Vol. 397, pp. 225–251. doi 10.1016/j.jalgebra.2013.08.032.
24. Osinovskaya A.A., Suprunenko I.D. Inductive systems of representations with small highest weights for natural embeddings of symplectic groups // *Trudy Instituta matematiki*. 2014. Vol. 22, no. 2. pp. 109–118.
25. Osinovskaya A.A., Suprunenko I.D. Stabilizers and orbits of first level vectors in modules for the special linear groups. *J. Group Theory*, 2013, Vol. 16, pp. 719–743. doi: 10.1515/jgt-2013-0010.
26. Kondrat'ev A.S., Osinovskaya A.A., Suprunenko I.D. On the behavior of elements of prime order from a Zinger cycle in representations of a special linear group. *Proc. Steklov Inst. Math. (Suppl.)*, 2014, vol. 285, no 1, pp. S108–S115. doi: 10.1134/S0081543814050113
27. Kondrat'ev A.S., Suprunenko I.D., Khramtsov I.V. On finite 4-primary groups having a disconnected Gruenberg–Kegel graph and a composition factor isomorphic to  $L_3(17)$  or  $Sp_4(4)$ , *Trudy Instituta Matematiki i Mekhaniki UrO RAN*, 2022, vol. 28, no. 1, pp. 139–155. doi: 10.21538/0134-4889-2022-28-1-139-155.

Received January 20, 2023

Revised January 20, 2023

Accepted January 30, 2023

*Vyacheslav Ivanovich Yanchevskii*, a Member of the National Academy of Sciences of Belarus, Dr. Phys.-Math. Sci., Prof., Institute of Mathematics of the National Academy of Sciences of Belarus, Minsk, 220072 Belarus, e-mail: yanch@im.bas-net.by.

*Anatolii Semenovich Kondrat'ev*, Dr. Phys.-Math. Sci., Krasovskii Institute of Mathematics and Mechanics of the Ural Branch of the Russian Academy of Sciences, Yekaterinburg, 620108 Russia, e-mail: A.S.Kondratiev@imm.uran.ru

*Tatsiana Sergeevna Busel*, Ph. D., Institute of Mathematics of the National Academy of Sciences of Belarus, Minsk, 220072 Belarus, e-mail: tbusel@im.bas-net.by.

*Anna Aleksandrovna Osinovskaya*, Ph. D., Institute of Mathematics of the National Academy of Sciences of Belarus, Minsk, 220072 Belarus, e-mail: anna@im.bas-net.by .

Cite this article as: V. I. Yanchevskii, A. S. Kondrat'ev, T. S. Busel, A. A. Osinovskaya. To the memory of Irina Dmitrievna Suprunenko. *Trudy Instituta Matematiki i Mekhaniki UrO RAN*, 2023, vol. 29, no. 1 , pp. 280–287 .