

ON SOLVABILITY OF EQUATIONS IN THE CLASSES OF SOLVABLE GROUPS AND LIE ALGEBRAS

V. A. ROMAN'KOV

Following [1], we present a survey on solvability of group equations in the class of nilpotent groups. In particular, we give some results on solvability of the commutator equation of the form $[x, y] = g$, where g is an element of the group and x, y are variables, in the class of nilpotent groups. The most important of these results is the following

Theorem. [2] *There exists a finitely generated nilpotent group G of class 2 with undecidable the commutator problem. Hence the Diophantine problem for quadratic equations is undecidable in G too.*

Further we present results about commutator width of some relatively free Lie algebras and nilpotent groups, derived in [3].

We will discuss results about solvability of equations with endomorphisms in the class of finitely generated nilpotent groups [4] in connection with [5], [6], [7].

At last we discuss some new not published yet results on solvability of equations over solvable groups.

Acknowledgements. This research was supported by Russian Science Foundation (project 16-11-0002).

СПИСОК ЛИТЕРАТУРЫ

- [1] Roman'kov V.A. Equations over groups. Groups, Complexity, Cryptology. 2012. 4. No. 2. 191-239.
- [2] Roman'kov V.A. Diophantine questions in the class of finitely generated nilpotent groups. Journal of Group Theory. 2016. 19. No. 3. 497-514.
- [3] Романьков В.А. Коммутаторная ширина некоторых относительно свободных алгебр Ли и нильпотентных групп. Сибирский математический журнал. 2016. 57, 4. 866-888.
- [4] Романьков В.А. О разрешимости уравнений с эндоморфизмами в нильпотентных группах. Сибирские электронные математические известия. 2016. 13. 716-725. <http://semr.math.nsc.ru>.
- [5] Roman'kov V.A. Twisted conjugacy classes in nilpotent groups. J. Pure Appl. Algebra. 215, 4. 664-671.
- [6] Roman'kov V.A. The twisted conjugacy problem for endomorphisms of polycyclic groups. J. Group Theory. 13, 3. 355-364.
- [7] Вентура Э., Романьков В.А. Проблема скрученной сопряженности для эндоморфизмов метабелевых групп. Алгебра и логика. 2009. 48, 2. 157-173.

DOSTOEVSKY OMSK STATE UNIVERSITY, OMSK (RUSSIA)
E-mail address: romankov48@mail.ru