Bastos, R.; de Oliveira, R.; Monetta, C.; Rocco, N. R.
On some series of a group related to the non-abelian tensor square of groups. (English)
J. Algebra 598, 236-253 (2022)

Summary: Let $G$ be a group. We denote by $\nu(G)$ a certain extension of the non-abelian tensor square $G \otimes G$ by $G \times G$. In this paper we prove that the derived subgroup $\nu(G)'$ is a central product of three normal subgroups of $\nu(G)$, all isomorphic to the non-abelian tensor square $G \otimes G$. As a consequence, we describe the structure of each term of the derived and lower central series of the group $\nu(G)$.

MSC:
20J06 Cohomology of groups
20E22 Extensions, wreath products, and other compositions of groups
20J05 Homological methods in group theory
20F05 Generators, relations, and presentations of groups
20F14 Derived series, central series, and generalizations for groups
20D15 Finite nilpotent groups, $p$-groups
18G50 Nonabelian homological algebra (category-theoretic aspects)

Keywords:
non-abelian tensor square of groups; biderivations; derived and lower central series; finite $p$-groups

Software:
GAP

Full Text: DOI arXiv

References:
[1] Bacon, M. R., On the non-abelian tensor square of a nilpotent of a group, Glasg. Math. J., 36, 291-296 (1994) · Zbl 0831.20037
[2] Bacon, M. R.; Kappe, L.-C., The nonabelian tensor square of a 2-generator $p$-group of class 2, Arch. Math., 61, 508-516 (1993) · Zbl 0823.20021
[3] Bacon, M.; Kappe, L.-C.; Morse, R. F., On the nonabelian tensor square of a 2-Engel group, Arch. Math., 69, 353-364 (1997) · Zbl 0884.20001
[4] Bastos, R.; de Melo, E.; Gonçalves, N.; Monetta, C., The exponent of the non-abelian tensor square and related constructions of $p$-groups, Math. Nachr. (2021), in press
[5] Bastos, R.; de Melo, E.; Gonçalves, N.; Nunes, R., Non-abelian tensor square and related constructions of $p$-groups, Arch. Math., 114, 481-490 (2020) · Zbl 1455.20018
[6] Beaucle, J. R.; Kappe, L.-C., Infinite metacyclic groups and their non abelian tensor squares, Proc. Edinb. Math. Soc., 43, 651-662 (2000) · Zbl 0985.20022
[7] Blyth, R. D.; Funagalli, F.; Morigi, M., Some structural results on the non-abelian tensor square of groups, J. Group Theory, 13, 83-94 (2010) · Zbl 1206.20033
[8] Blyth, R. D.; Morse, R. F., Computing the nonabelian tensor squares of polycyclic groups, J. Algebra, 321, 2139-2148 (2009) · Zbl 1195.20035
[9] Brown, R.; Johnson, D. L.; Robertson, E. F., Some computations of non-abelian tensor products of groups, J. Algebra, 111, 177-202 (1987) · Zbl 0626.20038
[10] Brown, R.; Toddy, J.-L., Van Kampen theorems for diagrams of spaces, Topology, 26, 311-335 (1987), (with an appendix by M. Zisman) · Zbl 0622.55009
[11] Bueno, T. P.; Rocco, N. R., On the q-tensor square of a group, J. Group Theory, 14, 785-805 (2011) · Zbl 1247.20060
[12] R.K. Dennis, In search of new “homology” functors having a close relationship to K-theory, Preprint, Cornell University, Ithaca, NY, 1976.
[13] Eick, B.; Nickel, W., Computing the Schur multiplier and the nonabelian tensor square of a polycyclic group, J. Algebra, 320, 927-944 (2008) · Zbl 1163.20022
[14] Ellis, G., On the tensor square of a prime power group, Arch. Math., 66, 467-469 (1996) · Zbl 0854.20023
Ellis, G.; Leonard, F., Computing Schur multipliers and tensor products of finite groups, Proc. R. Ir. Acad., 95A, 137-147 (1995) · Zbl 0863.20010

Haabauer, T., On non-abelian tensor squares of linear groups, Arch. Math., 55, 30-34 (1990) · Zbl 0763.20012

GAP - Groups, Algorithms, and Programming, Version 4.10.2 (2019)

Johnson, D. L., The non-abelian tensor square of the finite metacyclic group, Proc. Edinb. Math. Soc., 30, 91-96 (1987) · Zbl 0588.20022

Kappe, L.-C., Nonabelian tensor products of groups: the commutator connection, (Proc. Groups St. Andrews 1997 at Bath. Proc. Groups St. Andrews 1997 at Bath, London Math. Soc. Lecture Notes, vol. 261 (1999)), 447-454 · Zbl 1011.20035

Magidin, A.; Morse, R. F., Certain homological functors for 2-generator p-groups of class two, (Computational Group Theory and the Theory of Groups, II. Computational Group Theory and the Theory of Groups, II, Contemporary Mathematics, vol. 511 (2010)), 127-166 · Zbl 1215.20019

Miller, C., The second homology group of a group: relations among commutators, Proc. Am. Math. Soc., 3, 588-595 (1952) · Zbl 0047.25703

Moravec, P., The exponents of nonabelian tensor products of groups, J. Pure Appl. Algebra, 212, 1849-1848 (2008) · Zbl 1187.20050

Moravec, P., Groups of prime power order and their nonabelian tensor squares, Isr. J. Math., 174, 19-28 (2009) · Zbl 1197.20013

Rocco, N. R., On a construction related to the non-abelian tensor square of a group, Bol. Soc. Bras. Mat., 22, 63-79 (1991) · Zbl 0791.20020

Rocco, N. R., A presentation for a crossed embedding of finite solvable groups, Commun. Algebra, 22, 1975-1998 (1994) · Zbl 0819.20032

Sidki, S. N., On weak permutability between groups, J. Algebra, 63, 186-225 (1980) · Zbl 0442.20014

Visscher, M. P., On the nilpotency class and solvability length of the nonabelian tensor product of groups, Arch. Math., 73, 161-171 (1999) · Zbl 0940.20041

This reference list is based on information provided by the publisher or from digital mathematics libraries. Its items are heuristically matched to zbMATH identifiers and may contain data conversion errors. It attempts to reflect the references listed in the original paper as accurately as possible without claiming the completeness or perfect precision of the matching.