

RECENT ADVANCES IN SYMMETRIC POLYNOMIALS

ŞEHMUS FINDIK

Let F_n be the free algebra generated by the set $\{x_1, \dots, x_n\}$ of variables in a variety of algebras over a field of characteristic zero. A polynomial $p \in F_n$ is called symmetric, if $p(x_{\pi(1)}, \dots, x_{\pi(n)}) = p(x_1, \dots, x_n)$, for each permutation $\pi \in S_n$. The set $F_n^{S_n}$ of symmetric polynomials is a subalgebra of F_n . In this talk, we review the works [1, 2, 3, 4, 5, 6, 7], in which the algebra $F_n^{S_n}$ is examined, where F_n is

- * the free metabelian Lie algebra of rank n ;
- * the free metabelian Leibniz algebra of rank n ;
- * the free metabelian Poisson algebra of rank n ;
- * the free metabelian associative algebra of rank 2;
- * the free algebra generated by two 2×2 generic traceless matrices;
- * the free algebra of rank 2 in the variety generated by Grassmann algebras.

REFERENCES

- [1] N. Akdoğan, Ş. Fındık, Symmetric polynomials in the variety generated by Grassmann algebras, *Journal of Algebra and Its Applications* **22** (2023) 1, 2350019. <https://doi.org/10.1142/S0219498823500196>
- [2] V. Drensky, Ş. Fındık, N. Ş. Ögüslü, Symmetric polynomials in the free metabelian Lie algebras, *Med. J. Math.* **17** (2020) 5, 1-11. <https://doi.org/10.1007/s00009-020-01582-8>
- [3] A. Dushimirimana, Ş. Fındık, N. Ş. Ögüslü, Symmetric polynomials in the free metabelian Poisson algebras, *Journal of Algebra and Its Applications* **22** (2023) 2, 2350049. <https://doi.org/10.1142/S0219498823500494>
- [4] Ş. Fındık, Symmetric polynomials in the free metabelian associative algebra of rank 2, *Turkish J. Math.* **46** (2022) 5, 1809-1813. <https://doi.org/10.55730/1300-0098.3233>
- [5] Ş. Fındık, O. Kelekci, Symmetric polynomials of algebras related with 2×2 generic traceless matrices, *International Journal of Algebra and Computation*, **31** (2021) 07, 1433-1442. <https://doi.org/10.1142/S0218196721500521>
- [6] Ş. Fındık, N. Ş. Ögüslü, Palindromes in the free metabelian Lie algebras, *Internat. J. Algebra Comput.* **29** (2019) 5, 885-891. <https://doi.org/10.1142/S0218196719500334>
- [7] Ş. Fındık, Z. Özkurt, Symmetric polynomials in Leibniz algebras and their inner automorphisms, *Turkish J. Math.*, **44** (2020) 6, 2306-2311. <https://doi.org/10.3906/mat-2006-44>

DEPARTMENT OF MATHEMATICS, ÇUKUROVA UNIVERSITY, 01330 BALCALI, ADANA, TURKEY
E-mail address: sfindik@cu.edu.tr

Key words and phrases. Symmetric polynomials, metabelian, Lie algebra, Leibniz algebra, Poisson algebra.