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Dragan Stankov



Дигитални репозиторијум Рударско-геолошког факултета Универзитета у Београду

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## The alternative to Mahler measure of polynomials in several variables

Dragan Stankov

*University of Belgrade, Faculty of Mining and Geology, Djusina 7, 11120 Belgrade*  
*e-mail: dragan.stankov@rgf.bg.ac.rs*

**Abstract.** We introduce the ratio of the number of roots of a polynomial  $P_d$ , greater than one in modulus, to its degree  $d$  as an alternative to Mahler measure. We investigate some properties of the alternative. We generalise this definition for a polynomial in several variables using Cauchy's argument principle. If a polynomial in two variables do not vanish on the torus we prove the theorem for the alternative which is analogous to the Boyd-Lawton limit formula for Mahler measure. We determine the exact value of the alternative of  $1 + x + y$  and  $1 + x + y + z$ . Numerical calculations suggest a conjecture for the exact value of the alternative of such polynomials having more than three variables.

**Keywords:** Mahler measure; argument principle; Boyd-Lawton limit formula.

### References

- [1] **V. Flammang, P. Voutier.** Properties of trinomials of height at least 2, *Rocky Mountain J. Math.*, 2022, 52(2), 507 - 518.
- [2] **G. R. Everest, T. Ward.** Heights of Polynomials and Entropy in Algebraic Dynamics. *Springer-Verlag London Ltd., London*, 1999.
- [3] **D. Stankov.** The number of unimodular roots of some reciprocal polynomials. *Comptes Rendus Mathématique*, 2020, Volume 358 no. 2, 159 - 168.