The alternative to Mahler measure of polynomials in several variables

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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.

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