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A Note on a Paper by M. Mignotte

Alkiviadis G. Akritas
University of Kansas
Department of Computer Science
Lawrence, Kansas 66045

In his paper "An Inequality About Factors of Polynomials" [1] M. Mignotte proved the following sharp inequality about the product of some roots of a polynomial. (This inequality was then used to bound the coefficients of the factors of a polynomial.)

Theorem. Let $P = \sum_{i=0}^{d} a_i x^i$ be a polynomial with complex coefficients. Let $z_1, z_2, \ldots, z_k$ be those zeros of P (counted with their multiplicities) such that $1 \leq |z_1| \leq |z_2| \leq \ldots \leq |z_k|$. Then

$$|a_d| \prod_{i=1}^{k} |z_i| \leq \|P\| ,$$

where $\|P\| = (\Sigma |a_i|^2)^{\frac{1}{2}}$.

Given its importance to Computer Algebra, I would like to point out that this very theorem (along with several other interesting inequalities) was first proved by Wilhelm Specht in his 1949 paper [2].

References:

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