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On the regions containing zeros and zero free regions of a Polynomial

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Abstract

If $P(z) = \sum_{j=0}^{n} a_j z^j, a_j \geq a_{j-1}, a_0 > 0, j = 1, 2, \cdots, n$ is a polynomial of degree n, then according to a classical result of Eneström-Kakeya, all the zeros of $P(z)$ lie in $|z| \leq 1$. Joyal (et al) [9] extended Theorem A to the polynomials whose coefficients are monotonic but not necessarily non-negative.In this paper, I will prove some extensions and generalizations of this result by relaxing the hypothesis.

Key words: *Polynomial, Zeros,* Eneström-Kakeya *Theorem*
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