JONAS JANKAUSKAS, University of Waterloo, Department of Pure Mathematics
On Littlewood Polynomials with Prescribed Number of Zeros Inside the Unit Disk

We investigate the numbers of complex zeros of Littlewood polynomials $p(z)$ (polynomials with integer coefficients $\{-1, 1\}$) inside or on the unit circle $|z| = 1$, denoted by $N(p)$ and $U(p)$, respectively. Two types of Littlewood polynomials are considered: Littlewood polynomials with one sign change in the sequence of coefficients and Littlewood polynomials with one negative coefficient.

We obtain explicit formulas for $N(p)$, $U(p)$ for polynomials $p(z)$ of these types. In particular, we show that if $n + 1$ is a prime number, then for each integer k, $0 \leq k \leq n - 1$, there exists a Littlewood polynomial $p(z)$ of degree n with $N(p) = k$ and $U(p) = 0$. Furthermore, we describe some cases when the ratios $N(p)/n$ and $U(p)/n$ have limits as $n \to \infty$ and find the corresponding limit values.