Losonczi, Lászó
On the zeros of reciprocal polynomials. (English) Zbl 1438.30014

A complex polynomial $P(z)$ of degree $n$ is called reciprocal if \( z^n P(1/z) = P(z) \). The purpose of this paper is to characterize the reciprocal polynomials whose zeros are located in one of the following sets: half planes $\text{Re} \, z > 0$, $\text{Re} \, z < 0$, the positive and negative half-lines and the unit circle. The main tool in the proofs is the Chebyshev transform. The results are demonstrated on the degree 4 reciprocal polynomials. In this case the Chebyshev transform is a quadratic polynomial and thus relevant expressions can be explicitly calculated. The author also gives bounds for the coefficients of the reciprocal polynomials whose zeros are either positive or negative.

Reviewer: Alexander Ulanovskii (Stavanger)

MSC:

30C15 Zeros of polynomials, rational functions, and other analytic functions of one complex variable 
(e.g., zeros of functions with bounded Dirichlet integral)
12D10 Polynomials in real and complex fields: location of zeros (algebraic theorems)

Keywords:
reciprocal polynomial; location of zeros

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