Homogeneous minimal polynomials with prescribed interpolation conditions

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Abstract

Given a compact set $E$ in $\mathbb{C}^{n+1}$, we consider the problem of finding a homogeneous polynomial of degree $d$ on $\mathbb{C}^{n+1}$ who deviates the least from zero on $E$ among all those satisfying interpolation conditions of the form $p(a) = f(a)$, $a \in A$, where $A$ is a finite subset of $\mathbb{C}^{n+1}$ and $f$ is any function on $A$. We show how this formalism enables one to recover several types of minimal polynomial previously studied and prove that these polynomials obey certain general invariance properties under polynomials maps.