POLYNOMIAL CONTROL FOR LINEAR SYSTEMS AND ZEROS OF ENTIRE FUNCTIONS

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Abstract

We will study the problem of controlling a linear system $x' = Ax + bu$ with polynomial controls. We discuss conditions on the eigenvalues of A that determine when the system is controllable with a polynomial of degree less than or equal to n or $n-1$. We verify the conjecture that a certain entire function has no zeros of multiplicity $n+1$, hence proving that if A has a certain single Jordan block form then the system is controllable with a polynomial of degree n.