ELA

http://math.technion.ac.il/iic/ela

SHARP LOWER BOUNDS FOR THE DIMENSION OF LINEARIZATIONS OF MATRIX POLYNOMIALS[*]

FERNANDO DE TERÁN[†] AND FROILÁN M. DOPICO[‡]

Abstract. A standard way of dealing with matrix polynomial eigenvalue problems is to use linearizations. Byers, Mehrmann and Xu have recently defined and studied linearizations of dimensions smaller than the classical ones. In this paper, lower bounds are provided for the dimensions of linearizations and strong linearizations of a given $m \times n$ matrix polynomial, and particular linearizations are constructed for which these bounds are attained. It is also proven that strong linearizations of an $n \times n$ regular matrix polynomial of degree ℓ must have dimension $n\ell \times n\ell$.

Key words. Matrix polynomials, Matrix pencils, Linearizations, Dimension.

AMS subject classifications. 15A18, 15A21, 15A22, 65F15.