

**ON THE DISTANCE FROM A WEAKLY NORMAL
MATRIX POLYNOMIAL TO MATRIX POLYNOMIALS
WITH A PRESCRIBED MULTIPLE EIGENVALUE***

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Abstract. Consider an $n \times n$ matrix polynomial $P(\lambda)$. An upper bound for a spectral norm distance from $P(\lambda)$ to the set of $n \times n$ matrix polynomials that have a given scalar $\mu \in \mathbb{C}$ as a multiple eigenvalue was obtained by Papathanasiou and Psarrakos (2008). This paper concerns a refinement of this result for the case of weakly normal matrix polynomials. A modified method is developed and its efficiency is verified by two illustrative examples. The proposed methodology can also be applied to general matrix polynomials.

Keywords: Matrix polynomial, Eigenvalue, Normality, Perturbation, Singular value.

AMS Classification: 15A18, 65F35.

*Received by the editors on February 22, 2015. Accepted for publication on February 13, 2016.
Handling Editor: Bryan L. Shader.

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