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NEAREST SOUTHEAST SUBMATRIX THAT MAKES MULTIPLE AN EIGENVALUE OF THE NORMAL NORTHWEST SUBMATRIX

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Abstract. Let A,B,C,D be four complex matrices, where $D \in \mathbb{C}^{m\times m}$ and $A \in \mathbb{C}^{n\times n}$ is a normal matrix. Let z_0 be an fixed eigenvalue of A. We find the distance (with respect to the 2-norm) from D to the set of matrices $X \in \mathbb{C}^{m\times m}$ such that z_0 is a multiple eigenvalue of the matrix

$$\begin{pmatrix} A & B \\ C & X \end{pmatrix}.$$

We also give an expression for one of the closest matrices.

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