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# ON REDUCING AND DEFLATING SUBSPACES OF MATRICES*

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**Abstract.** A multilinear approach based on Grassmann representatives and matrix compounds is presented for the identification of reducing pairs of subspaces that are common to two or more matrices. Similar methods are employed to characterize the deflating pairs of subspaces for a regular matrix pencil $A + sB$, namely, pairs of subspaces $(\mathcal{L}, \mathcal{M})$ such that $A\mathcal{L} \subseteq \mathcal{M}$ and $B\mathcal{L} \subseteq \mathcal{M}$.

**Key words.** Reducing subspace, Deflating subspace, Invariant subspace, Compound matrix, Grassmann space, Decomposable vector, Matrix pencil.

**AMS subject classifications.** 15A75, 47A15, 15A69, 15A22.

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