

# Singular-Value-like Decompositions in Indefinite Inner Product Spaces

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The singular value decomposition is an important tool in Linear Algebra and Numerical Analysis. Besides providing a canonical form for a matrix  $A$  under unitary basis changes, it simultaneously displays the eigenvalues of the associated Hermitian matrices  $AA^*$  and  $A^*A$ . Similarly, one can ask the question if there is a canonical form for a complex matrix  $A$  that simultaneously displays canonical forms for the complex symmetric matrices  $AA^T$  and  $A^T A$ .

In this talk, we answer this question in a more general setting involving indefinite inner products and defining an analogue of the singular-value decomposition in real or complex indefinite inner product spaces.