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CHOLESKY-LIKE FACTORIZATIONS OF SKEW-SYMMETRIC MATRICES*

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Abstract. Every real skew-symmetric matrix B admits Cholesky-like factorizations $B = R^T JR$, where $J = \begin{bmatrix} 0 & I \\ -I & 0 \end{bmatrix}$. This paper presents a backward-stable $\mathcal{O}(n^3)$ process for computing such a decomposition, in which R is a permuted triangular matrix. Decompositions of this type are a key ingredient of algorithms for solving eigenvalue problems with Hamiltonian structure.

Key words. skew-symmetric matrices, matrix factorizations, Hamiltonian eigenproblems, complete pivoting.

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