ORTHOSYMMETRIC BLOCK ROTATIONS

SANJA SINGER†

Abstract. Rotations are essential transformations in many parts of numerical linear algebra. In this paper, it is shown that there exists a family of matrices unitary with respect to an orthosymmetric scalar product $J$, that can be decomposed into the product of two $J$-unitary matrices—a block diagonal matrix and an orthosymmetric block rotation. This decomposition can be used for computing various one-sided and two-sided matrix transformations by divide-and-conquer or tree-like algorithms. As an illustration, a blocked version of the QR-like factorization of a given matrix is considered.

Key words. Orthosymmetric unitary matrices, Orthosymmetric block rotations, Generalized polar decomposition, QR-like factorization, Test matrix generation.

AMS subject classifications. 15A23, 65F30.