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ETNA
Kent State University
etna@mcs.kent.edu

A NEW SOURCE OF STRUCTURED SINGULAR VALUE DECOMPOSITION PROBLEMS *

ANA MARCO† AND JOSÉ-JAVIER MARTÍNEZ‡

Abstract. The computation of the Singular Value Decomposition (SVD) of structured matrices has become an important line of research in numerical linear algebra. In this work the problem of inversion in the context of the computation of curve intersections is considered. Although this problem has usually been dealt with in the field of exact rational computations and in that case it can be solved by using Gaussian elimination, when one has to work in finite precision arithmetic the problem leads to the computation of the SVD of a Sylvester matrix, a different type of structured matrix widely used in computer algebra. In addition only a small part of the SVD is needed, which shows the interest of having special algorithms for this situation.

Key words. curves, intersection, singular value decomposition, structured matrices.

AMS subject classifications. 14Q05, 65D17, 65F15.

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†Departamento de Matemáticas, Universidad de Alcalá, Campus Universitario, 28871-Alcalá de Henares, Madrid, Spain. E-mail: ana.marco@uah.es.

‡Departamento de Matemáticas, Universidad de Alcalá, Campus Universitario, 28871-Alcalá de Henares, Madrid, Spain. E-mail: jjavier.martinez@uah.es.