

数学与系统科学研究院

计算数学所学术报告

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报告题目:

**ON THE CONDITIONING OF  
FACTORS IN THE SR  
DECOMPOSITION**

邀请人: 白中治 研究员

报告时间: 2016 年 7 月 20 日 (周三)

晚上 19:30-20:30

报告地点: 数学院南楼七层

702 会议室

## **Abstract:**

Almost every nonsingular matrix can be decomposed into the product of a symplectic matrix  $S$  and an upper  $J$ -triangular matrix  $R$ . This decomposition is not unique. In this paper we analyze the freedom of choice in the symplectic and the upper  $J$ -triangular factors and review several existing suggestions on how to choose the free parameters in the  $SR$  decomposition. In particular we consider two choices leading to the minimization of the condition number of the diagonal blocks in the upper  $J$ -triangular factor and to the minimization of the conditioning of the corresponding blocks in the symplectic factor. We develop bounds for the extremal singular values of the whole upper  $J$ -triangular factor and the whole symplectic factor in terms of the spectral properties of evendimensioned principal submatrices of the skew-symmetric matrix associated with the  $SR$  decomposition. The theoretical results are illustrated on two small examples.

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