

Timo Eirola, Marko Huhtanen, Jan von Pfaler : *Solution methods for \mathbb{R} -linear problems in \mathbb{C}^n* ¹; Helsinki University of Technology Institute of Mathematics Research Reports A454 (2003).

Abstract: *We consider methods, both iterative and direct, for solving an \mathbb{R} -linear system $Mz + M_{\#}\bar{z} = b$ in \mathbb{C}^n with a pair of matrices $M, M_{\#} \in \mathbb{C}^{n \times n}$ and a vector $b \in \mathbb{C}^n$. Algorithms that avoid formulating the problem as an equivalent real linear system in \mathbb{R}^{2n} are introduced. Conversely, this implies that real linear systems in \mathbb{R}^{2n} can be solved with the methods proposed in this paper. Our study is motivated by Krylov subspace iterations with which using the real formulation can be disastrous in the standard linear case. Related matrix analysis and spectral theory are developed.*

AMS subject classifications: 15A04, 65F10

Keywords: \mathbb{R} -linear operator in \mathbb{C}^n , characteristic bivariate polynomial, isometry, LU-decomposition, QR-factorization, iterative methods, consimilarity

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