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*Editorial*

# Numerical Methods of Complex Valued Linear Algebraic System

**Shi-Liang Wu,[1] Shu-Qian Shen,[2] Masoud Hajarian,[3] Jia Liu,[4] and Lev A. Krukier[5]**

[1] *School of Mathematics and Statistics, Anyang Normal University, Anyang 455000, China*
[2] *College of Science, China University of Petroleum, Qingdao 266580, China*
[3] *Department of Mathematics, Faculty of Mathematical Sciences, Shahid Beheshti University, General Campus, Evin, Tehran 19839, Iran*
[4] *Department of Mathematics and Statistics, University of West Florida, Pensacola, FL 32514, USA*
[5] *Southern Federal University, Computer Center, 200/1 Stachky Avenue, Building 2, Rostov-on-Don 344090, Russia*

Correspondence should be addressed to Shi-Liang Wu; wushiliang1999@126.com

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Complex linear system is an important branch in the field of the linear systems, which arises in a number of scientific computing and engineering applications, such as wave propagation, diffuse optical tomography, quantum mechanics, electromagnetism, molecular scattering, structural dynamics, electrical power system modeling, and lattice quantum chromodynamics. Therefore, the research on it has now drawn general attention, such as numerical algorithms and important theories.

To this end, this special issue is focused on the latest achievements in the related topics. The aim is to provide a forum for researches and scientists to communicate their recent developments and to present their novel results. Potential topics include but are not limited to iterative methods for complex linear systems, preconditioning techniques for complex linear systems, parallel computations for complex linear systems, and numerical methods for complex nonlinear systems.

Some authors have been invited to present their original articles that will stimulate the continuing efforts in developing new results in the relative areas.

C.-M. Li and S.-Q. Shen present two new types of Newton method for computing the nonsingular square root of a matrix $A$ and provide convergence theorems and stability analysis for these new proposed algorithms.

L. Gao et al. present some valid bounds for the infinity norm of the inverse of Nekrasov matrices. The proposed results are superior to that of the published results by Kolotilina (2013), which can be used to prove the convergence of matrix splitting and matrix multisplitting iteration methods for solving large sparse linear systems.

L.-T. Zhang et al., by introducing more relaxed parameters, construct relaxed matrix parallel multisplitting chaotic generalized USAOR-style methods to solve the linear systems with coefficient matrices being $H$-matrices or irreducible diagonally dominant matrices. The parameters can be adjusted suitably to improve the convergence property of methods. Some applied convergence results of methods to be convenient for carrying out numerical experiments are reported.

S.-L. Wu and Y.-J. Liu, based on a classical accelerated overrelaxation (AOR) iterative method, present a new version of the AOR method to solve the system of linear equations, discuss its convergence under the conditions that the coefficient matrices are irreducible diagonal dominant, $L$-matrices, $H$-matrices, symmetric positive definite matrices, and provide a relational graph for the new AOR method and the original AOR method.

C.-X. Li and S.-H. Li investigate a class of the iteration method from the double splitting of coefficient matrix for solving the linear system, present the iteration matrix of the corresponding double splitting iteration method by structuring a new matrix, and provide some new convergence and comparison theorems on spectral radius for splittings of matrices on the basis of convergence and comparison theorems for single splittings.

M. Xu et al. give some inequalities on upper and lower bounds for the entries of the inverse of doubly strictly diagonally dominant $M$-matrix. And some new inequalities on the lower bound for the minimal eigenvalue of the corresponding matrix and the corresponding eigenvector are presented to establish an upper bound for the $\ell_1$-norm of the solution $x(t)$ for the linear differential system $\dot{x}(t) = -Ax(t)$ with $x(t) = x^0 > 0$.

J. Wang and C. Li derive two improved exponential stability criteria for a class of stochastic time-delay systems by using the decomposition technique and Lyapunov stability theory and report some numerical results to illustrate the effectiveness and the benefit of the proposed method.

S. Luo et al. study the nonparametric regressive function with missing response data. Three local linear $M$-estimators with the robustness of local linear regression smoothers are presented such that they have the same asymptotic normality and consistency.

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*Lev A. Krukier*