

2009 SIAM Conference on Applied Linear Algebra

Part of [CP7 Numerical Linear Algebra and Applications](#)

Linear Systems with Large Off-Diagonal Elements and Discontinuous Coefficients

Abstract. Previous work showed that "geometric" scaling of the equations is useful for handling nonsymmetric systems with discontinuous coefficients. It is shown that after such scaling, AA^T contains relatively large diagonal elements. These two operations are inherent in the sequential CGMN and the block-parallel CARP-CG algorithms, making them very effective for systems with large off-diagonal elements and discontinuous coefficients. Examples involving heterogeneous media include convection-diffusion equations with large convection and the Helmholtz equation with large wave numbers.

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