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New High Order Group Iterative Schemes in the Solution of Poisson Equation

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Abstract : We investigate the formulation and implementation of new explicit group iterative methods in solving the two-dimensional Poisson equation with Dirichlet boundary conditions. The methods are derived from a fourth order compact nine point finite difference discretization. The methods are compared with the existing second order standard five point formula to show the dramatic improvement in computed accuracy. Numerical experiments are presented to illustrate the effectiveness of the proposed methods.

Keywords : explicit group iterative method, finite difference, fourth order compact, Poisson equation
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