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## SIXTH ORDER SRECHOS FOR TWO-DIMENSIONAL CONVECTION-DIFFUSION EQUATIONS

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Present work is a development of the finite difference discretization algorithm based on Richardson extrapolation technique and obtained a spectral resolutioned exponential compact higher order scheme (SRECHOS\*) for two-dimensional linear Convection-Diffusion Equations (CDE). The fourth order SRECHOS, based on the compact nine point stencil, is used to discretize the governing equation over fine and coarse grids. The resulting algebraic systems are solved using line iterative approach with alternate direction implicit (ADI) procedure. Combining the solutions over fine and coarse grids, sixth order solution over coarse grid points is obtained. The resultant solution is extended to finer grid by interpolation derived from the difference operator. The convergence of the iterative procedure is guaranteed as the coefficient matrix of the developed scheme satisfies the conditions required to be positive. The higher order accuracy and better rate of convergence of the developed algorithm have been demonstrated by solving numerous model problems for two dimensional CDE. The developed scheme has been compared with the existing sixth order compact schemes and observed that the former predicts more accurate solutions even for convection dominated problem.

\* Y.V.S.S. Sanyasiraju, N. Mishra, Spectral resolutioned exponential compact higher order scheme (SRECHOS) for convection-diffusion equation, *Comput. Methods Appl. Mech. Engrg.* 197 (2008), 4737–4744

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