Third Order Parallel splitting Method for nonhomogeneous Heat Equation with Integral Boundary Conditions

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Abstract

A third order parallel algorithm is proposed to solve one dimensional non-homogenous heat equation with integral boundary conditions. For this purpose, we approximate the space derivative by third order finite difference approximation. This parallel splitting technique is combined with Simpson's 1/3 rule to tackle the nonlocal part of this problem. The algorithm develop here is tested on two model problems. We conclude that our method provides better accuracy due to availability of real arithmetic.

***Keywords*:** Parabolic partial differential equation; Non-local boundary conditions; Finite difference scheme; Integral boundary condition.