

ABSTRACT

The importance of approximation techniques for the numerical solution of second order hyperbolic partial differential equation in one space variable can not be denied. The parallel splitting method is one of those techniques which possess appropriate stability properties and are implemented on a hyperbolic partial differential equation (PDE) in one space variable. The space derivative in partial differential equation (PDE) is approximated by third-order approximation via the method of lines (MOL). Semi-discretization approach gives system of ordinary differential equations. The solution of this system satisfies a recurrence relation, which involves matrix exponential function, this matrix exponential function is approximated by $E_3(\theta)$ to achieve third-order accuracy in time. For the mathematical calculations Fortran language is used. The calculations are performed using double precision and the numerical results obtained are analysed.