**Semi implicit hybrid methods with higher order dispersion for solving oscillatory problems**

ABSTRACT

In this paper, two-step fourth order semi implicit hybrid method (SIHM) with dispersion of order six and zero dissipation is constructed for solving second order ordinary differential equations (ODEs). Numerical results show that SIHM is more accurate as compared to the existing hybrid method, Runge-Kutta Nyström (RKN) method, Runge-Kutta (RK) method and Diagonally Implicit Runge-Kutta Nyström (DIRKN) method of the same order. The interval of absolute stability of SIHM for ODE is presented. The comparison of time for solving the test problems for the various methods is also given.

**Keyword:** Dispersion; Semi implicit hybrid method; Stability; Two-step methods