

## **Diagonally implicit Runge-Kutta Nystrom general method order five for solving second order IVPs**

### **ABSTRACT**

A diagonally implicit Runge-Kutta-Nystrom General (SDIRKNG) method of fifth order with an explicit first stage for the integration of second-order IVPs is presented. A standard set of test problems are tested upon and the numerical results are compared when the same set of test problems are reduced to first-order system and solved using existing fifth order singly diagonally implicit Runge-Kutta method. The time taken to solve each problem over all the stepsizes are also compared. The results suggest the superiority of the new method.

**Keyword:** Diagonally implicit; Runge-Kutta-Nystrom; Second-order IVPs