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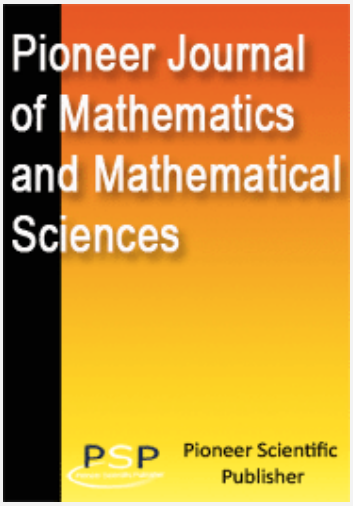


# FIFTH ORDER EXTENDED EXPLICIT RUNGE-KUTTA NYSTRÖM-LIKE METHOD FOR THE SOLUTION OF SECOND ORDER ORDINARY DIFFERENTIAL EQUATIONS

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**Abstract**

Fifth order explicit extended Runge-Kutta Nyström type method is constructed for numerical integration of special second order system of differential equations of the form $y'' = f(x, y)$. We introduce additional parameters into classical Runge-Kutta Nyström method in such a way that the first derivative of $f(x, y)$ might be required for the integration. Constant step-size code is presented. The method is applied on several model problems in the scientific literature. Results obtained from the numerical experiments suggests the superiority of the new codes over several existing codes of the same algebraic order in the literature.

**Keywords and phrases:** Runge-Kutta Nyström, second order equation, stability, numerical solution.