

## **Trigonometrically-fitted higher order two derivative Runge-Kutta method for solving orbital and related periodical IVPs**

### **ABSTRACT**

In this paper, a trigonometrically-fitted two derivative Runge-Kutta method (TFTDRK) of high algebraic order for the numerical integration of first order Initial Value Problems (IVPs) which possesses oscillatory solutions is constructed. Using the trigonometrically-fitted property, a sixth order four stage Two Derivative Runge-Kutta (TDRK) method is designed. The numerical experiments are carried out with the comparison with other existing Runge-Kutta methods (RK) to show the accuracy and efficiency of the derived methods.

**Keyword:** Two derivative Runge-Kutta method; Trigonometrically-fitted; Ordinary differential equations; Initial value problems