

## **Using Chebyshev Polynomial to economize the approximation of some one-step method**

**Fola Adeyeye and Opeyemi Enoch,  
Kampala International University, Uganda.,  
Federal University Oye, Nigeria.**

Chebyshev polynomial crop up in virtually every area of Numerical analysis and they hold particular importance in recent advancement in subject such as Orthogonal. In this paper, we present the classical theory of Chebyshev polynomial starting from the definition and generation of the family of both the 1st, the 2nd kind and the complex classical polynomial of Chebyshev polynomial, which are related to their real and imaginary parts. This permit one to develop the theory of a class of Orthogonal polynomial that are that basis for fitting non-algebraic function with polynomial of maximum efficiency. The generated series polynomial is use to Economize the approximation of some One-step methods such as RKMII and Runge-kutta-Feldberg method. An Economic table that represent the operation at various states of mesh point is shown.

**Keywords:** Chebyshev polynomial 1st and 2nd kind; One-stap method (RKM<sub>II</sub>); Runge-kutta-fehlberg method; Economize series.