

1108-41-32

**Somayeh Mashayekhi\*** ([sm2395@msstate.edu](mailto:sm2395@msstate.edu)), 21 Ace Ave, Starkville, MS 39759. *New numerical method for Fractional calculus.*

Due to the extensive applications of dynamical systems with fractional order (DSFOs) in engineering and science, research in this area has grown significantly, and there has been considerable interest in developing numerical schemes for their solution. Spectral method is one of the numerical methods that is used to find the solution of DSFOs. Two different attempts were performed in this area. In the first attempt, mathematicians tried to introduce a new base that usually was called Jacobi polyfractonomials. Jacobi polyfractonomials were used as a trial function to find the approximation of solution for dynamical systems with fractional order. However, this new trial function has some limitation. In the other attempt, authors tried to use classical orthogonal functions or wavelet of orthogonal functions as a trial function. Furthermore, for solving DSFOs by these wavelet functions, the operational matrices for fractional order (OMFO) of these wavelets were calculated. But they did not find OMFO directly. In this area we had two important questions. First, Do we need to introduce new base to use as a trial function as they did in the first attempt? Second, can we find OMFO directly without using block-pulse functions. In this work I want to talk about these two question. (Received November 22, 2014)