

Solving Zhou chaotic system using fourth-order Runge-Kutta method

ABSTRACT

Most of scientific problems and natural phenomena can be modeled by chaotic systems of ordinary differential equations. These problems can be solved by using various methods. In this paper, we are interested to test the Runge-Kutta method of order four on the Zhou chaotic system. This system is a new three-dimensional autonomous chaotic system. Numerical comparisons are made between the Runge-Kutta of order four and the Euler's method. Comparisons were also done between the RK4 methods but with different time steps. It has been observed that the accuracy of RK4 solutions can be increased by decreasing the time step. Our work shows that RK4 method successfully can solve the Zhou system and figures are given for different number of iterations with corresponding range of time, t .

Keyword: Euler's method; Fourth-order Runge-Kutta method; Zhou chaotic system.