

Homework 8 - Physics 240

Comet Extraordinair

Tin Tran

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1 Introduction

The original Lorenzt code was done using the Runge-Kutta adaptive time step method, so in this homework I changed it to use the Fourth order Runge-Kutta method.

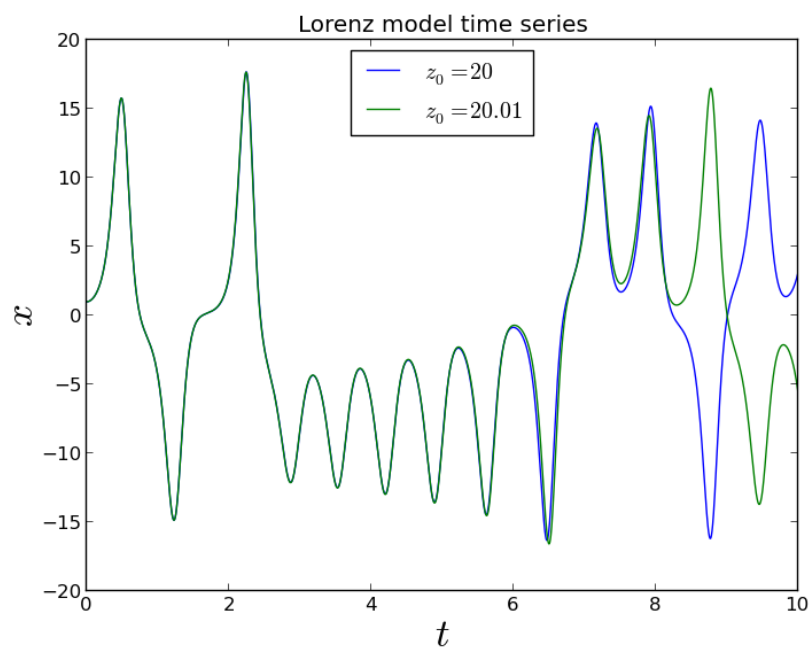


Figure 1: Lorentz model

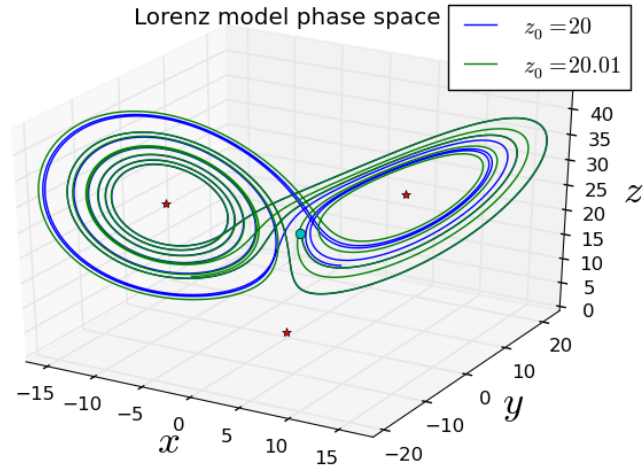


Figure 2: Lorentz model phase space

Compared to the adaptive method, which takes 1.72 seconds for 500 time steps with the accuracy of 0.0001, to produce the time plot above, the Fourth order Runge-Kutta meethod takes 8.17 seconds with 10000 time steps, a considerable longer time. I could implement the same model time for both, but that would not give the Fourth order Runge-kutta enough time to have the same plot as the Adaptive method.