
Changes Made After Peer Review

Avi Vajpeyi

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1 GRAMMATICAL AND SPELLING ERRORS

The peer review from Yunjia and Dr. Byrnes was helpful in pointing out grammatical errors, and confusing sections in the paper. Dr. Byrnes' review pointed out several mistakes such as extraneous words, and missing words. For example, she pointed out that in the sentence "...such as migratory pattern of birds..," I was missing "the" before "migratory." Additionally, she pointed out that when a figure is referenced, it should be referenced with "Figure #", rather than "figure #." There were several other grammatical, and spelling errors that she highlighted in my paper, which I corrected.

2 COMPREHENSION OF THE PAPER

Dr. Byrnes identified several sections of the paper that were unclear. Below is a list of several aspects she found unclear:

1. The introduction for numerical integration and discussions on Ordinary Differential Equations.
2. How Euler-Cromer and the Runge Kutta algorithms work with step code.
3. The difference between chaotic and non-chaotic regions in a graph, and why chaotic regions have been defined as 'speckled'.

2.1 NUMERICAL INTEGRATION SECTION

To explain the process of numerical integration better, I added a new subsection called 'Integration in Simulations,' which compared the 'Midpoint Rule' to the integration algorithms

discussed in this paper. This introduced numerical integration by providing a simple explanation of how the midpoint rule works, with the help of a diagram. It then elaborated on how the functions we integrate in this simulation are dependent on time, and hence deal with 'time steps.'

2.2 EULER-CROMER AND RUNGE-KUTTA

I added an image of the implementation of the Euler-Cromer algorithm into the paper to help show the reader how the algorithm is used in my simulation. Additionally, I included the step code for the Runge-Kutta algorithm, as advised by Dr. Byrnes. Although I think that this might confuse the reader, I can see how it might be important for the user to see the algorithm. As I did not want to elaborate on how this algorithm works (as it would take a lot of space), I asked the reader to refer to an article discussing the algorithm.

2.3 CHAOTIC VERSUS NON CHAOTIC

Dr. Byrnes pointed out that I had not explained what chaotic nature is. Hence, I edited my original explanation for what a chaotic region is, in the 'Simple Example' section of the paper, to help the definition stand out more. I also tried to further explain the difference between the chaotic and the non chaotic trends that we can observe. Additionally, Dr. Byrnes pointed out that I used the word 'speckled' to describe the chaotic regions in the graphs for the scattering angle against the impact parameter. As this wording was vague, I changed 'speckled regions' to 'regions where the scattering angle fluctuates rapidly.'

2.4 ENERGY PLOTS

After talking to Dr. Byrnes about how the energy of a particle is used to check the integration accuracy, I decided to write a short section on the energy of the particle. I provided two graphs showing that with the Runge-Kutta 4 algorithm, the energy remains constant.

2.5 TABLE OF FIGURES

Dr. Byrnes also suggested inserting a list of figures before the table of contents, as my paper incorporated numerous diagrams. Hence, this was also added to the final version of my paper.

2.6 OTHER EDITS

There were several other edits that I made - for example, I changed some of the figures (for example, the screen shots of the simulation), to match more recent versions. I also edited some of the captions so that they were more readable. I also added an appendix with the code for my simulation.