

Computational Physics II - Semester Project Proposal

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Abstract:

When one thinks of chaotic or unpredictable behavior, an example that naturally comes to mind is the weather. A great deal of effort has been devoted into computer modeling of the Earth's atmosphere, but there has also been a steady effort in understanding the weather from a more fundamental point of view. I propose to use a three-dimensional model of the atmosphere via the Lorenz equations, which revolve around a simplified model of convection, to study the processes occurring. The program *Matlab* will be used to analyze this chaotic system and allow for a graphical representation of system evolution.

References:

- [1] Galvez, Akemi. "Numerical-Symbolic *Matlab* Program for the Analysis of Three-Dimensional Chaotic Systems." University of Cantabria, Department of Applied Mathematics and Computational Sciences, Springer Berlin / Heidelberg, 2007. PP. 211-218.
- [2] Giordano *et al.* "Computational Physics: Second Edition." Pearson Prentice Hall, Upper Saddle River, NJ, 2006. PP. 75-81.

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