

1135-39-2438

Oluwaseye Adekanye* (seyeadekanye@gmail.com) and **Talitha Washington**. *Constructing nonstandard finite difference (NSFD) schemes for dynamical systems*. Preliminary report.

Many real world phenomena can be modeled by dynamical systems that describe the evolution of phenomena over time. For example, the growth and decay equation models how a quantity changes over time. The transport equation with a flux term models the flow of a particle through a given medium. The Airy equation models the diffraction of light. The Tacoma Narrows Bridge models describe the torsional and vertical oscillations on the day of its collapse. Using solutions to subequations of a system, we can develop the foundation for an exact nonstandard finite difference scheme (NSFD) which may preserve properties of the dynamical system into its discretization which leads to dynamical consistency. Some systems may require the NSFD scheme to adhere to time and space step size constraints. In this talk, we will show how to construct NSFD schemes for various models that may outperform the traditional standard finite difference schemes. (Received September 26, 2017)