

1116-VC-2492      **Daniel Wood\*** ([daniel.wood@mavs.uta.edu](mailto:daniel.wood@mavs.uta.edu)). *Advancements and Applications of Nonstandard Finite Difference Methods.*

A class of dynamically consistent numerical methods are analyzed for general  $n$ -dimensional productive-destructive systems (PDS). Using this analysis, a methodology for constructing positive and elementary stable nonstandard numerical methods is established. The nonstandard approach results in qualitatively superior numerical methods when compared to the standard ones. PDS model a wide range of dynamical systems, including ones with biological, chemical and physical interactions. Building upon this, a nonstandard finite difference method for solving autonomous dynamical systems with positive solutions is constructed. The proposed numerical methods are computationally efficient and easy to implement. Several examples are given which show that the numerical results agree with the theoretical results. (Received September 22, 2015)