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**Ronald E Mickens\*** (rohrrs@math.gatech.edu), Clark Atlanta University, Box 1744 - Physics Department, Atlanta, GA 30314. *Numerical Integration of Population Models Satisfying Conservation Laws: NSFD Methods.*

Population models arising in ecology, epidemiology and mathematical biology may involve a conservation law, i.e., the total is constant. In addition to these cases, other situations may occur for which the total population, asymptotically in time, approach a constant value. Since it is rarely the situation that the equations of motion can be analytically solved to obtain exact solutions, it follows that numerical techniques are needed to provide solutions. However, numerical procedures are only valid if they can reproduce fundamental properties of the differential equations modeling the phenomena of interest. We show that for population models, involving a dynamical conservation law the use of nonstandard finite difference (NSFD) methods allows the construction of discretization schemes such that they are dynamically consistent (DC) with the original differential equations. The presentation will briefly discuss the NSFD methodology, the concept of DC, and illustrate their application to specific problems for population models. (Received September 06, 2006)