1135-92-539 **Ronald E. Mickens*** (rmickens@cau.edu), Clark Atlanta University, Department of Physics, Atlanta, GA 30314. *Some Methodologies for Constructing Discrete-Time Population Models.*

The lack of fundamental rules for the construction of interacting population models has not prevented their appearnce in the research literature. Our goal is to present several methodologies for generating such models and demonstrate their value by explicitly building schemes for both single- and two-interacting populations. This work is an extension of previous results by Bhattacharya [1] and Mickens [2]. The central issue is to derive discrete-time models such that positivity holds for the dynamics of the populations. We also discuss the relevance of these methodologies for the numerical integration of differential equations [3].

References

[1] M. C. Bhattacharya, A new improved finite difference equation for heat transfer during transient change, Applied Mathematical Modelling, 10 (1986), 68–70.

[2] R. E. Mickens, A NSFD scheme for the linear time-dependent Schrödinger equation, Journal of Difference Equations and Applications, 12 (2006), 313–320. (Received September 07, 2017)