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Mohsen Razzaghi* (razzaghi@math.msstate.edu), Department of Mathematics and Statistics, Mississippi State University, Mississippi State, MS 39762. *A numerical solution for a nonlinear integro-differential equation in a population model.*

A numerical method for solving Volterra's population model for population growth of a species in a closed system is proposed. Volterra's model is a nonlinear integro-differential equation where the integral term represents the effects of toxin. The approach is based upon hybrid function approximations. The properties of hybrid functions which consists of block-pulse and Legendre polynomials are presented. The associated operational matrices of integration and product are then utilized to reduce the solution of the Volterra's model to the solution of a system of algebraic equations. The method is easy to implement and computationally very attractive. Applications are demonstrated through an illustrative example. (Received September 09, 2008)