

The differential transform method for solving the model describing biological species living together

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Abstract: F. Shakeri. and M. Dehghan in [1] presented the variational iteration method for solving the model describing biological species living together. Here, we suggest the differential transform (DT) method for finding the numerical solution of this problem. To this end, we give some preliminary results of the DT and by proving some theorems, we show that the DT method can be easily applied to mentioned problem. Finally several test problems are solved and compared with variational iteration method.

Keywords: biological species living together, differential transform method, Volterra integro-differential equations, variational iteration method.

References:

- [1] F. Shakeri, M. Dehghan, Solution of a model describing biological species living together using the variational iteration method, *Mathematical and Computer Modeling*, vol. 48, pp. 685-699, 2008.
- [2] J.K. Zhou, *Differential Transform and its Application for Electric Circuits*, Huazhong University Press, Wuhan, China, 1986.
- [3] F. Ayaz, Application of differential transform method to differential-algebraic equations, *Math. Comput.*, vol. 152, pp. 649-657, 2004.
- [4] F. Ayaz, Solutions of the system of differential equations by differential transform method, *Appl. Math. Comput.*, vol. 147, pp. 547-567, 2004 .
- [5] F. Ayaz, On the two-dimensional differential transform method, *Appl. Math. Comput.*, vol. 143, pp. 361-374, 2003.
- [6] C.K. Chen, Solving partial differential equations by two dimensional differential transform, *Appl. Math. Comput.*, vol. 106, pp. 171-179, 1999.
- [7] A. Arikoglu, I. Ozkol, Solution of boundary value problem for integro-differential equations by using differential transform method, *Appl. Math. Comput.*, vol. 168, pp. 1145-1158, 2005.
- [8] Z. M. Odibat, Differential transform method for solving Volterra integral equations with separable kernels, *Math. Comput. Model.*, vol. 48, pp. 1144-1149, 2008.
- [9] Z. M. Odibat, S. Momani, V.S. Erturk, Generalized differential transform method: Application to differential equations of fractional order, *Appl. Math. Comput.*, vol. 197, pp. 467-477, 2008.
- [10] V.S. Erturk, S. Momani, Z.M. Odibat, Application of generalized differential transform method to multi order fractional differential equations, *Commu. in Nonlin. Sci. and Num. Simul.*, vol. 13, pp. 1642-1654, 2008.