World Academy of Science, Engineering and Technology
International Journal of Mathematical and Computational Sciences
Vol:10, No:10, 2016

A Spectral Decomposition Method for Ordinary Differential Equation Systems with Constant or Linear Right Hand Sides

Authors : R. B. Ogunrinde, C. C. Jibunoh

Abstract : In this paper, a spectral decomposition method is developed for the direct integration of stiff and nonstiff homogeneous linear (ODE) systems with linear, constant, or zero right hand sides (RHSs). The method does not require iteration but obtains solutions at any random points of t, by direct evaluation, in the interval of integration. All the numerical solutions obtained for the class of systems coincide with the exact theoretical solutions. In particular, solutions of homogeneous linear systems, i.e. with zero RHS, conform to the exact analytical solutions of the systems in terms of t.

Keywords : spectral decomposition, linear RHS, homogeneous linear systems, eigenvalues of the Jacobian
Conference Title : ICMCS 2016 : International Conference on Mathematics and Computational Science
Conference Location : New York, United States
Conference Dates : October 10-11, 2016

Open Science Index, Mathematical and Computational Sciences Vol:10, No:10, 2016 publications.waset.org/abstracts/54215.pdf