World Academy of Science, Engineering and Technology
International Journal of Mathematical and Computational Sciences
Vol:11, No:02, 2017

Large Time Asymptotic Behavior to Solutions of a Forced Burgers Equation

Authors : Satyanarayana Engu, Ahmed Mohd, V. Murugan

Abstract : We study the large time asymptotics of solutions to the Cauchy problem for a forced Burgers equation (FBE) with the initial data, which is continuous and summable on R. For which, we first derive explicit solutions of FBE assuming a different class of initial data in terms of Hermite polynomials. Later, by violating this assumption we prove the existence of a solution to the considered Cauchy problem. Finally, we give an asymptotic approximate solution and establish that the error will be of order O(t^(-1/2)) with respect to L^p -norm, where $1 \leq p \leq \infty$, for large time.

Keywords : Burgers equation, Cole-Hopf transformation, Hermite polynomials, large time asymptotics
Conference Title : ICMSSC 2017 : International Conference on Mathematics, Statistics and Scientific Computing
Conference Location : Kuala Lumpur, Malaysia
Conference Dates : February 12-13, 2017

Open Science Index, Mathematical and Computational Sciences Vol:11, No:02, 2017 publications.waset.org/abstracts/65872/pdf