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
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