NON HOMOGENEOUS DIRICHLET PROBLEM
FOR THE KDVB EQUATION ON A SEGMENT

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Abstract. We study the Non homogeneous Dirichlet problem with large initial data for the KdVB equation on the interval $x \in (0, 1)$

$$\begin{align*}
    u_t + uu_x - uu_{xx} + uu_{xxx} &= 0, \quad t > 0, \quad x \in (0, 1) \\
    u(x, 0) &= u_0(x), \quad x \in (0, 1) \\
    u(0, t) = u(1, t) &= 0, \quad t > 0 \\
    u_x(1, t) &= h(t), \quad t > 0.
\end{align*}$$

We prove that if the initial data $u_0 \in L^2$ and boundary data $h(t) \in H^1_\infty (0, \infty)$ then there exist a unique solution $u \in C \left( (0, \infty); L^2 \right) \cup C \left( (0, \infty); H^1 \right)$ of the initial-boundary value problem (1). We also obtain the large time asymptotic of solution uniformly with respect to $x \in (0, 1)$ as $t \to \infty$.


Keywords and phrases: dissipative dispersive nonlinear equation, large time asymptotics, KdVB equation.

REFERENCES


