SUBCRITICAL NONLINEAR PSEUDODIFFERENTIAL EQUATION OF SOBOLEV TYPE ON A HALF–LINE

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Abstract. We study the initial- boundary value problem for the complex pseudodifferential equation of Sobolev type on a half-line

$$\begin{cases} \partial_t u + \lambda \, |u|^\sigma u + \mathbb{K}u = 0, \ x \in \mathbb{R}^+, \ t > 0, \\ \qquad u(0,x) = u_0(x), \ x \in \mathbb{R}^+, \end{cases}$$

where $0 < \sigma < 1, \ \lambda \in \mathbb{C}$,

$$\mathbb{K}u = \frac{1}{2\pi i} \int_{-i\infty}^{i\infty} e^{px} K(p) \widehat{u}(t,p) dp.$$

the symbol $K(p)$ is defined as

$$K(p) = (-1)^{n+1} p^{2n} \prod_{j=1}^n (p^2 - a_j^2)^{-1},$$

$n \in N, \ \operatorname{Re} a_j > 0, j = 1, 2 \dots, n, \ \theta(x)..$ The aim of this paper is to prove the global existence of solutions to the inital-boundary value problem and to find the main term of the asymptotic representation of solutions in the subcritical case,when the nonlinear term of the equation has the time decay rate less then that of the linear terms.

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