

## The KdV equation as a Hamiltonian system. Symplectic form in terms of left scattering data

Kyrylo Andreiev, *Kharkiv, Ukraine*

For the Korteweg-de Vries equation

$$q_t(x, t) - 6q(x, t)q_x(x, t) + q_{xxx}(x, t) = 0$$

with steplike initial profile  $q(x, 0) = q(x)$ , which is of the Schwartz type in the following meaning:

$$\int_{\mathbb{R}_+} x^m (|q(-x) - c^2| + |q(x)|) dx + \int_{\mathbb{R}} |x|^m |q^{(s)}(x)| dx < \infty, \quad \forall m, s \geq 1,$$

we propose a representation of the symplectic form in terms of the left scattering data. Our work generalizes the well known result of V.E. Faddeev and L.D. Zakharov [1].

Research supported by the State Fund For Fundamental Research (project N  $\Phi 83/82$  - 2018).

- [1] V.E. Zakharov, L.D. Faddeev The Korteweg-de Vries equation — completely integrable Hamiltonian system // Functional Analysis and Its Applications, 5:4 (1971), 18–27.