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Scattering problem for compatible ordinary differential equations and nonlinear Schrödinger equation on the semi-axis

The present communication is devoted to the scattering problem for compatible ordinary differential equations connected with the nonlinear Schrödinger equation on the semi-axis. We propose an approach different from [1] and based on the transformation operators for x- and t- equations. We deduce, so-called, xt- and txintegral equations of the Marchenko type and obtain a characteristic properties of the scattering data. These characteristic properties allow us to reconstruct the compatible ordinary differential equations by two complex-valued functions with a support on the semi-axis, using the integral equations of the Marchenko type.

Reference: [1] A. S. Fokas and A. R. Its. The linearization of the initial-boundary value problem of the nonlinear Schrödinger equation. SIAM J. Math. Anal, **27** (1996), N 3, 738-764.