

1096-35-2156

Barbara Prinari* (bprinari@uccs.edu), University of Colorado at Colorado Springs, 1420 Austin Bluffs Pkwy, Colorado Springs, CO 80918. *The inverse scattering transform for the focusing nonlinear Schrödinger equation with fully asymmetric non-zero boundary conditions.* Preliminary report.

We present the inverse scattering transform (IST) for the focusing nonlinear Schrödinger equation: $iq_t = q_{xx} + 2|q|^2q$ with non-zero boundary values $q_{\pm}(t)$ as $x \rightarrow \pm\infty$, in the fully asymmetric case $q_+ \neq q_-$. The direct problem is shown to be well-posed for potentials $q(x, t)$ such that $q(x, t) - q_{\pm}(t) \in L^{1,1}(\mathbb{R}^{\pm})$ with respect to x for all $t \geq 0$, for which analyticity properties of eigenfunctions and scattering data can be established. The inverse scattering problem is formulated both via (left and right) Marchenko integral equations, and as a Riemann-Hilbert problem on a single sheet of the scattering variables $\lambda_{\pm} = \sqrt{k^2 - |q_{\pm}|^2}$, k being the usual complex scattering parameter in the IST.

This talk is based on a joint work in progress with Francesco Demontis and Cornelis van der Mee (Università di Cagliari, Italy), and Federica Vitale (Università del Salento e Sezione INFN di Lecce, Italy). (Received September 17, 2013)