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Inverse scattering transform for a square matrix nonlinear Schrödinger equation with nonzero boundary conditions. Preliminary report.

In this talk we discuss the Inverse Scattering Transform (IST) under nonzero boundary conditions for a square matrix nonlinear Schrödinger equation which has been proposed as a model to describe hyperfine spin $F = 1$ spinor Bose-Einstein condensates with either repulsive interatomic interactions and anti-ferromagnetic spin-exchange interactions, or attractive interatomic interactions and ferromagnetic spin-exchange interactions.

We formulate the IST in terms of a suitable uniformization variable, which allows to define the direct and inverse problems on the complex plane, instead of a two-sheeted Riemann surface or the cut plane with discontinuities along the cuts; and we discuss the soliton solutions. (Received January 17, 2017)