

On nonlinear Fourier transform and on nonlinear superposition for the AKNS-type equations

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The zero-curvature formalism provides a general scheme for solving initial value problems for nonlinear integrable equations. Indeed, many interesting solutions have been obtained by means of different implementations of this strategy. However, this approach does not provide much help for finding explicit (at least approximate) solutions of initial value problems for *arbitrarily chosen initial conditions*. In the talk we shall address some issues related to this problem by means of a perturbative approach. We will describe our approach in the case of the AKNS-type partial differential equations. The particular form of the L -matrix of these systems provides a close link to the linear Fourier analysis which is quite helpful.