

A DISCRETE NONLINEAR MODEL OF THREE
COUPLED DYNAMICAL FIELDS INTEGRABLE
BY THE CAUDREY METHOD

O. O. Vakhnenko

Bogolyubov Institute for Theoretical Physics,
Nat. Acad. Sci. of Ukraine
(14b, Metrolohichna Str., Kyïv 03143, Ukraine;
e-mail: *vakhnenko@bitp.kiev.ua*),
Institute of Geophysics
(63b, Bohdan Khmel'nyts'kyi Str., Kyïv 01054, Ukraine)

S u m m a r y

A nonlinear model of three coupled dynamical fields on an infinite regular chain is proposed. The system admits the zero curvature representation constituting the basis for its integration within the framework of inverse scattering transform. The associated auxiliary spectral problem is basically of the third order and gives rise to a fairly complicated subdivision into the regularity domains of Jost functions in the plane of a complex spectral parameter. As a result, both the direct and inverse scattering problems turn out to be substantially nontrivial. The Caudrey version of the direct and inverse scattering techniques for the needs of model integration is adapted. The simplest soliton solution is found.