
Integration of Non-Abelian Lattices of Toda-type

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Abstract

This work is devoted to integration of semi-infinite and finite non-Abelian lattices of Toda-type, that is, nonlinear differential-difference equations that can be written in a Lax form

$$\dot{L}(t) = [L(t), A(t)] ,$$

where L is a tridiagonal matrix of order $N \leq \infty$ whose entries are bounded operators in some Banach or Hilbert space and A is a finite band matrix of the same order whose entries depend on those of L . We develop an inverse spectral problem method for such equations that generalizes the one suggested by Yu. M. Berezanskii for solving the semi-infinite Toda lattice.