
JINBING CHEN, Southeast University

The backward Neumann system to the construction of algebro-geometric solutions of the negative-order KdV hierarchy

In this talk, the backward Neumann system is applied to deduce algebro-geometric solutions for the negative-order KdV (nKdV) hierarchy. From a symmetric constraint, the nKdV hierarchy is reduced to a class of backward Neumann systems that separate its temporal and spatial variables. The backward Neumann systems are shown to be integrable in the Liouville sense, whose involutive solutions yield the finite parametric solutions of nKdV hierarchy. The negative-order Novikov equation is attained to specify a finite-dimensional invariant subspace of nKdV flows. Under the Abel-Jacobi variable, the nKdV flows are integrated with Abel-Jacobi solutions on the Jacobi variety of a Riemann surface. Finally, the Riemann-Jacobi inversion of Abel-Jacobi solutions is studied, by which some algebro-geometric solutions to the nKdV hierarchy are derived.