SIDE 14.2

Contribution ID : 72

Hydrodynamic chain hierarchy and skew-orthogonal polynomials

Content :

The discrete integrable structure concealed by orthogonal matrix ensembles is the Pfaff lattice, built on a semi-infinite moment matrix defined for a skew-symmetric weight. The dependence on the infinitely many times is encoded at the level of the weight, and gives rise to an integrable hierarchy expressed as the collection of infinitely many Lax equations. The leading order of the continuum limit of the variables populating the lattice can be recast in the form of an integrable hydrodynamic chain for every time, producing a hierarchy of hydrodynamic chains. With all the times set to zero, the eigenfunctions for the Pfaff lattice are semi-infinite skew-orthogonal polynomials and can be mapped onto orthogonal polynomials, eigenfunctions for the Toda lattice. The Pfaff lattice structure is completely determined and it offers valuable insight for the form of the field variables with nonzero times.

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Session classification : --not yet classified--

Track classification : --not yet classified--

Type : --not specified--