

SIDE 14.2



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Lagrangian multiforms and discrete and semi-discrete KP systems

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Content :

Recently I presented a Lagrangian 3-form structure for a generalised Darboux system. The original Darboux system arose in connection with the theory of conjugate nets for systems of orthogonal curvilinear coordinates. The generalised system, in which the relevant fields are labelled by continuous parameters which can be associated with lattice parameters of an underlying 3-dimensional integrable discrete system, amounts to a presentation of the KP hierarchy in terms of Miwa variables, and can be thought of as a "generating PDE" system for that hierarchy. In connection with this result, the case of Lagrangian multiforms for fully discrete and semi-discrete KP type systems was left open, except in the case of the bilinear form of the discrete KP equation the multiform structure of which was established in 2009. In contrast, I will present 3-form structures for the actual nonlinear forms of the (potential) discrete and semi-discrete KP equations.

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