SIDE 14.2

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Hamiltonian structures for nonabelian differential-difference systems

Tuesday 20 Jun 2023 at 09:45 (00h30')

Content :

Integrable nonabelian systems are equations of motion in which the field variables take values in a noncommutative algebra, as a matrix one. In a series of papers with Jing Ping Wang (Nonlinearity 2021, CMP 2022) we have investigated the Hamiltonian structure and recursion operators for hierarchies of differential-difference integrable equations, providing a geometrical interpretation that helps to shed some light onto the structure on nonabelian Hamiltonian systems in general.

I will present the notions of double multiplicative Poisson vertex algebra and of nonabelian functional polyvector fields, with the latter as the natural language to describe Hamiltonian systems in the familiar geometrical terms. As an application, I will discuss some results towards the classification of scalar Hamiltonian difference structures and present a list of such structures for the nonabelian generalization of well-known integrable systems such as Volterra, Toda and Kaup lattices.

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