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Geometric interpretation of the recursion operators for the generalized Zakharov-Shabat system in pole gauge on the Lie algebra A_2. (English) Zbl 1235.35238

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Summary: We consider the recursion operator approach to the soliton equations related to a generalized Zakharov-Shabat auxiliary linear system in pole gauge on the Lie algebra $A_2 = \mathfrak{sl}(3, \mathbb{C})$ and show that the recursion operator can be identified with the dual to a Nijenhuis tensor for a Poisson-Nijenhuis structure on the manifold of potentials.

MSC:

35Q51	Soliton equations
37K15	Inverse spectral and scattering methods for infinite-dimensional Hamiltonian and Lagrangian systems
35C08	Soliton solutions
17B81	Applications of Lie (super)algebras to physics, etc.

Keywords:

soliton equations; Zakharov-Shabat system; Lie algebra; Poisson-Nijenhuis structure