Szablikowski, Błażej M.
Hierarchies of Manakov-Santini type by means of Rota-Baxter and other identities. (English) Zbl 1343.37068

Summary: The Lax-Sato approach to the hierarchies of Manakov-Santini type is formalized in order to extend it to a more general class of integrable systems. For this purpose some linear operators are introduced, which must satisfy some integrability conditions, one of them is the Rota-Baxter identity. The theory is illustrated by means of the algebra of Laurent series, the related hierarchies are classified and examples, also new, of Manakov-Santini type systems are constructed, including those that are related to the dispersionless modified Kadomtsev-Petviashvili equation and so called dispersionless r-th systems.

MSC: 37K10 Completely integrable infinite-dimensional Hamiltonian and Lagrangian systems, integration methods, integrability tests, integrable hierarchies (KdV, KP, Toda, etc.) 37K30 Relations of infinite-dimensional Hamiltonian and Lagrangian dynamical systems with infinite-dimensional Lie algebras and other algebraic structures

Keywords: Manakov-Santini hierarchy; Rota-Baxter identity; classical r-matrix formalism; generalized Lax hierarchies; integrable (2 + 1)-dimensional systems

Full Text: DOI arXiv

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