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Semi-direct sums of Lie algebras and continuous integrable couplings. (English)

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Summary: A relation between semi-direct sums of Lie algebras and integrable couplings of continuous soliton equations is presented, and correspondingly, a feasible way to construct integrable couplings is furnished. A direct application to the AKNS spectral problem leads to a novel hierarchy of integrable couplings of the AKNS hierarchy of soliton equations. It is also indicated that the study of integrable couplings using semi-direct sums of Lie algebras is an important step towards complete classification of integrable systems.

MSC:

37K30 Relations of infinite-dimensional Hamiltonian and Lagrangian dynamical systems with infinite-dimensional Lie algebras and other algebraic structures

17B80 Applications of Lie algebras and superalgebras to integrable systems

Cited in **122** Documents

Keywords:

semi-direct sums of Lie algebras; zero curvature equations; integrable couplings; symmetries

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