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The quadratic-form identity for constructing the Hamiltonian structure of integrable systems. (English) [Zbl 1077.37045](#)

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Summary: A usual loop algebra, not necessarily the matrix form of the loop algebra \tilde{A}_{n-1} , is also made use of for constructing linear isospectral problems, whose compatibility conditions exhibit a zero-curvature equation from which integrable systems are derived. In order to look for the Hamiltonian structure of such integrable systems, a quadratic-form identity is created in the present paper whose special case is just the trace identity; that is, when taking the loop algebra \tilde{A}_1 , the quadratic-form identity presented in this paper is completely consistent with the trace identity.

MSC:

37K10 Completely integrable infinite-dimensional Hamiltonian and Lagrangian systems, integration methods, integrability tests, integrable hierarchies (KdV, KP, Toda, etc.)

17B80 Applications of Lie algebras and superalgebras to integrable systems

Cited in **1** Review
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Keywords:

[m-AKNS hierarchy](#); [loop algebra](#); [linear isospectral problems](#); [trace identity](#)

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