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How many types of soliton solutions do we know? (English) Zbl 1101.35069

Mladenov, Ivaïlo (ed.) et al., Proceedings of the 7th international conference on geometry, integrability and quantization, Sts. Constantine and Elena, Bulgaria, June 2–10, 2005. Sofia: Bulgarian Academy of Sciences (ISBN 954-8495-30-9/pbk). 11-34 (2006).

Summary: We discuss several ways of how one could classify the various types of soliton solutions related to nonlinear evolution equations that are solvable with the generalized $n \times n$ Zakharov-Shabat system. In doing so we make use of the fundamental analytic solutions, the dressing procedure and other tools characteristic for the inverse scattering method. We propose to relate to each subalgebra $\mathfrak{sl}(p)$, $2 \leq p \leq n$ of $\mathfrak{sl}(n)$, a type of one-soliton solutions which have $p - 1$ internal degrees of freedom.

For the entire collection see [\[Zbl 1089.53004\]](#).

MSC:

35Q55 NLS equations (nonlinear Schrödinger equations)

Cited in **2** Documents

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

37K15 Inverse spectral and scattering methods for infinite-dimensional Hamiltonian and Lagrangian systems

35Q51 Soliton equations

Keywords:

multicomponent nonlinear Schrödinger equation; Lax representation; Zakharov-Shabat system; inverse scattering method