

Filchakova, Valentina P.

PP-test for integrability of some evolution differential equations. (English) [Zbl 0961.37024](#)

Proceedings of the third international conference on symmetry in nonlinear mathematical physics, Kyiv, Ukraine, July 12-18, 1999. Part 2. Transl. from the Ukrainian. Kyiv: Institute of Mathematics of NAS of Ukraine. Proc. Inst. Math. Natl. Acad. Sci. Ukr., Math. Appl. 30(2), 387-391 (2000).

The author discusses the problem of connection between Painlevé transcendent and integrability of nonlinear PDE. This discussion is based on the Ablowitz-Ramani-Segur conjecture that every ODE obtained by similarity reduction from a PDE solvable with the inverse scattering method possesses the Painlevé property, i.e., all its removable singularities are poles. The author gives a survey of corresponding results and suggests a procedure for constructing the Painlevé transcendents. This procedure includes an algorithm of isolation of poles proposed by the author and uses the method of generalized power series developed by *P. F. Filtschakow* [Numerische und graphische Methoden der angewandten Mathematik. Braunschweig: Friedr. Vieweg (1975; [Zbl 0333.65001](#))].

For the entire collection see [[Zbl 0937.00046](#)].

Reviewer: [I.O.Parasyuk](#) (Kyïv)

MSC:

- [37K10](#) Completely integrable infinite-dimensional Hamiltonian and Lagrangian systems, integration methods, integrability tests, integrable hierarchies (KdV, KP, Toda, etc.)
- [34M55](#) Painlevé and other special ordinary differential equations in the complex domain; classification, hierarchies
- [37K20](#) Relations of infinite-dimensional Hamiltonian and Lagrangian dynamical systems with algebraic geometry, complex analysis, and special functions

Keywords:

nonlinear partial differential equation; Painlevé transcendent; singularity analysis; inverse scattering method; singular manifold method