

Recent results on integrable multidimensional PDEs connected with commuting vector fields.

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We use the nonlinear Riemann-Hilbert inverse problem for pencils of multidimensional vector fields [1, 2, 3] to study properties of the solutions of integrable multidimensional PDEs connected with their commutation, like the heavenly and the dispersionless Kadomtsev-Petviashvili (dKP) equations [4]. In particular, i) we study the longtime behavior of the solutions of their Cauchy problem. ii) We characterize classes of solutions of the above PDEs, associated with distinguished choices of the Riemann-Hilbert data. iii) We study the breaking mechanism of generic localized solutions of the dKP equation, a basic model for the description of the evolution of small amplitude, two-dimensional shallow water waves near the shore.

References

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