The problem of Gardner's deformation for $N = 2$ supersymmetric KdV equation

Arthemy Kiselev (UU)

In this survey talk we recall original Gardner's construction of integrable deformations for completely integrable KdV-type systems, and proceed with their geometric definition proposed by A.K. in 2006. Then we specify what Gardner's deformations actually are in terms of coverings over PDE and Baecklund transformations. Finally, we reveal the real nature of such deformations in terms of Gel'fand's high-energy asymptotic expansions of the wave function that solves the Sturm-Liouville eigenproblem within the inverse scattering method. Thence we state a no-go result on Gardner's deformations of the N=2 supersymmetric KdV equation, which yields an adequate reformulation of the corresponding open problem by P.Mathieu.

The talk is based on a recent joint work with V.Hussin (Montreal).