

# Integrable systems and local fields

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(Submitted on 8 Dec 2009)

In 70's there was discovered a construction how to attach to some algebraic-geometric data an infinite-dimensional subspace in the space  $k((z))$  of the Laurent power series. The construction is known as the Krichever correspondence. It was applied in the theory of integrable systems, particularly, for the KP and KdV equations. We show that the Krichever construction can be generalized to the case of dimension 2. We also include a known description of connection between the KP hierarchy in the Lax form and the vector fields on infinite Grassmanian manifolds and a construction of the semi-infinite monomes for the field  $k((z))$  which is an important part of the theory of Sato Grassmanian. The text was published in Communications in Algebra, 29(2001), No.9, 4157-4181. This version includes a corrected proof of the proposition 2. Also, we include some additional remarks on the deduction of concrete equations from the Lax hierarchy and appendix 2.

Comments: 31 pages

Subjects: **Algebraic Geometry (math.AG)**; Mathematical Physics (math-ph); Exactly Solvable and Integrable Systems (nlin.SI)

Journal reference: Communications in Algebra, 29 (2001), No.9, 4157-4181

Cite as: [arXiv:0912.1520v1](https://arxiv.org/abs/0912.1520v1) [math.AG]

## Submission history

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