

## INTEGRABLE TRANSFORMATIONS ON CENTROAFFINE POLYGONS

**Sergei Tabachnikov**

ABSTRACT. One can interpret the famous Korteweg–de Vries equation as a completely integrable evolution on centroaffine curves. Accordingly, symmetries (the Backlund transformation) of the KdV equation also can be realized as transformations of centroaffine curves. I shall discuss a discrete version of these transformations, where the curves are replaced by polygons. The focus will be on the geometrical aspects of the problem.

“The small divisors phenomenon in the problem of convergence of formal solutions to  $q$ -difference equations”

A sufficient condition for the convergence of a generalized formal power series solution to an algebraic  $q$ -difference equation is provided. The result uses a geometric property related to the semi-group of (complex) power exponents of such a series. This semi-group is finitely generated and there are two different situations depending on whether its generators are placed in some open half-plane in  $\mathbb{C}$  or not. In the second situation the small divisors phenomenon arises and the study of convergence of generalized formal power series solutions to an algebraic  $q$ -difference equation resembles the study of the problem of linearization of diffeomorphisms of  $(\mathbb{C}^n, 0)$ .