

ISOMONODROMY TRANSFORMATIONS OF LINEAR DIFFERENCE EQUATIONS AND PAINLEVÉ HIERARCHY

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Abstract

The classical differential Painlevé equations can be obtained as reductions of Schlesinger equations, which describe the isomonodromy deformations of certain linear systems of differential equations with rational coefficients. The goal of the course is to explain the discrete counterpart of this fact. More precisely, we will explain what an isomonodromy deformation of a difference linear system is, how in the case of small number of singularities it can be reduced to a discrete Painlevé equation, and why the resulting Painlevé equations have the geometric property of inducing automorphisms of del Pezzo surfaces. The notion of the tau-function for discrete isomonodromy transformations as well as its application to evaluating gap probabilities in random matrix type models will be discussed.