Algebro-Geometric Approach of Differential Equations of Painlevé type

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Abstract: The phase spaces of classical Painlevé equations of type I VI can be obtained as families of algebraic surfaces which was studied by K. Okamoto, H. Sakai and Saito-Takebe-Terajima. We would like to understand these families of algebraic surfaces as moduli spaces of parabolic connections over curves. In this talk, I would like to overview our algebraic approach to construct family of moduli spaces of parabolic connections with regular or irregular singularities over curves and to show that the Riemann-Hilbert correspondeces from the moduli spaces to connections to the generalized monodromy spaces are proper and birational. (Joint Work with M. Inaba and K. Iwasaki). These facts show that isomonodromic differential equations satisfy the geometric Painlevé property. I would also like to report on some interesting geometry on these equations of Painlevé type obtained jointly with A. Komyo, S. Szabo and F. Loray.