

# Properties of the series solutions for Painlevé equations

Federico Zullo

Roma Tre University, Italy

We present some observations on the asymptotic behaviour of the coefficients in the Laurent expansion of solutions of the Painlevé equations I, II and IV. A unique tau-function for the three equations is introduced. Explicit recursive formulae for the Taylor expansion of the tau-function around a zero are given, which are natural extensions of analogous formulae for the elliptic sigma function, as given by Weierstrass. Some numerical and exact results on the distribution of poles will be given.