Contribution ID: **7** Type: **Oral talk**

Long-time asymptotic series for the Painleve II equation: Riemann-Hilbert approach

Tuesday, 16 January 2024 16:25 (20 minutes)

We elaborate a systematic way to obtain higher order contributions in the nonlinear steepest descent method for Riemann-Hilbert problem associated with homogeneous Painleve II equation. The problem is reformulated as a matrix factorization problem on two circles and can be solved perturbatively reducing it to finite systems of algebraic linear equations. The method is applied to find explicitly long-time asymptotic behaviour for tau function of Painleve II equation.

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Session Classification: Afternoon session 1

Track Classification: Mathematical Physics