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Abstracts of Short Communications and Posters

Section:

8. Analysis

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Asymptotics of Orthogonal Polynomials via Integrable Methods

The speaker will present the results of recent joint work with P. Deift, K. T-R McLaughlin, S. Venakides, and X. Zhou. We consider weights $e^{-Q(x)}dx$ on the real line where Q is a polynomial of even degree with positive leading coefficient, and establish e. g. Plancherel-Rotach type asymptotics, uniform in the entire complex plane. These asymptotics are also used to prove various universality conjectures arising in random matrix theory. Our method is to express the orthogonal polynomials in terms of the solution of a Riemann-Hilbert problem, which we analyze by a steepest descent type method introduced by Deift and Zhou in the theory of integrable systems.