

« PREMIÈRE RENCONTRE MATHÉMATIQUE BAVIÈRE–QUÉBEC »
30 NOVEMBRE–3 DÉCEMBRE, 2009

“FIRST BAVARIA–QUÉBEC MATHEMATICAL MEETING”
NOVEMBER 30–DECEMBER 3, 2009

Orthogonal polynomials with respect to varying weights on the plane :
strong and weak results

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The asymptotics of orthogonal polynomials with complex varying weights on contours can be addressed in terms of a Riemann–Hilbert problem. We review what can be said for the simplest case of polynomial external fields. Similar considerations apply to orthogonal polynomials with respect a certain positive weight on the whole complex plane ; they can be reduced to orthogonal polynomials on some contour and their strong asymptotics deduced from the nonlinear steepest descent method of Deift and Zhou. In general, for positive varying weights on \mathbb{C} we can only obtain weak asymptotic results in the more general case of L^p - optimal polynomials.

The talk is based in part on joint work with F. Balogh, S. Y Lee, and K. T.-R. McLaughlin.