

1016-58-209

Marco Bertola* (bertola@CRM.UMontreal.CA). *Semiclassical biorthogonal polynomials: the bilinear concomitant and the duality between Riemann–Hilbert problems as intersection pairing.*

We consider the biorthogonal polynomials associated to the two–matrix model where the eigenvalue distribution has potentials V_1, V_2 with arbitrary rational derivative and whose supports are constrained on an arbitrary union of intervals. The multiplicative recurrence relations define Hessenberg matrices which solve a suitable reduction of the 2-Toda lattice with the constraint of the string equation. These polynomials satisfy certain recurrence relations with a number of terms d_i depending on the number of hard-edges and on the degree of the rational functions V_i' and these relations entail certain Christoffel–Darboux identities. Introducing appropriate integral transforms of the polynomials we formulate a Riemann–Hilbert problem for pairs of $(d_i + 1) \times (d_i + 1)$ matrices constructed out of the polynomials and these transforms: these pair are put in “perfect duality” by the Christoffel–Darboux kernels, which can be interpreted as the dressed form of the intersection pairing between homology classes of curves in the relative homology of the complex plane with punctures and certain sectors around the punctures. (Received February 13, 2006)