Mathematical Physics

Double scaling limits of random matrices and minimal (2m,1) models: the merging of two cuts in a degenerate case

Olivier Marchal, Mattia Cafasso

(Submitted on 17 Feb 2010 (v1), last revised 22 Feb 2010 (this version, v2))

In this article, we show that the double scaling limit correlation functions of a random matrix model when two cuts merge with degeneracy $2m$ (i.e. when $y \sim x^{2m}$ for arbitrary values of the integer m) are the same as the determinantal formulae defined by conformal $(2m,1)$ models. Our approach follows the one developed by Berg\`{e}re and Eynard in \cite{BergereEynard} and uses a Lax pair representation of the conformal $(2m,1)$ models (giving Painlev\'e II integrable hierarchy) as suggested by Bleher and Eynard in \cite{BleherEynard}. In particular we define Baker-Akhiezer functions associated to the Lax pair to construct a kernel which is then used to compute determinantal formulae giving the correlation functions of the double scaling limit of a matrix model near the merging of two cuts.

Comments:	37 pages, 4 figures, version 2: typos corrected
Subjects:	**Mathematical Physics (math-ph)**; Probability (math.PR); Exactly Solvable and Integrable Systems (nlin.SI)
Cite as:	**arXiv:1002.3347v2 [math-ph]**

Submission history

From: Olivier Marchal [view email]
[v1] Wed, 17 Feb 2010 18:57:07 GMT (54kb,D)
[v2] Mon, 22 Feb 2010 22:58:20 GMT (54kb,D)

Which authors of this paper are endorsers?

Link back to: arXiv, form interface, contact.