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Faculty of Physics



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Seminar

Bielefeld - Melbourne Random Matrices

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Fudan University, Shanghai

On integrals of the tronquée solutions and the associated Hamiltonians for the Painlevé II equation

In this talk, we consider a family of tronquée solutions of the Painlevé II equation

$$q''(s) = 2q(s)^3 + sq(s) - (2\alpha + 1/2), \quad \alpha > -1/2,$$

which is characterized by the Stokes multipliers

$$s_{-1} = -\exp[-2\alpha\pi i], \quad s_{-2} = \omega, \quad s_{-1} = -\exp[2\alpha\pi i]$$

with ω being a free parameter. These solutions include the well-known generalized Hastings-McLeod solution as a special case if $\omega = 0$. We derive asymptotics of integrals of the tronquée solutions and the associated Hamiltonians over the real axis for $\alpha > -1/2$ and $\omega \geq 0$, with the constant terms evaluated explicitly. Our results agree with those already known in the literature if the parameters α and ω are chosen to be special values. Some applications of our results in random matrix theory are also discussed. Joint work with Dan Dai and Shuai-Xia Xu.

Wednesday, 03 March 2021, 0900 hrs CET

Zoom Konferenzschaltung— Please contact Thorsten Neuschel
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