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Thomas Joachim Bothner* (`bothner@umich.edu`), Department of Mathematics, 530 Church Street, Ann Arbor, MI 48109. *The scaling function constant problem in the two-dimensional Ising model.*

We present a simple derivation of the constant factor in the short-distance asymptotics of the τ -function associated with the 2-point function of the two-dimensional Ising model. This factor was first computed by Tracy in [2] via an exponential series expansion of the correlation function. Further simplifications in the analysis are due to Tracy and Widom [3] using Fredholm determinant representations of the correlation function and Wiener-Hopf approximation results for the resolvent operator. Our method relies on an action integral representation of the τ -function and asymptotic results for the underlying Painlevé-III transcendent from [1].

References

- [1] B. McCoy, C. Tracy, T. Wu, Painlevé functions of the third kind, *J. Math. Phys.* **18** (1977), 1058-1092.
- [2] C. Tracy, Asymptotics of a τ -function arising in the two-dimensional Ising model, *Commun. Math. Phys.* **142** (1991), 297-311.
- [3] C. Tracy, H. Widom, Asymptotics of a class of solutions to the cylindrical Toda equations, *Commun. Math. Phys.* **190** (1998), 697-721.

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