

Chelkak, Dmitry; Duminil-Copin, Hugo; Hongler, Clément; Kemppainen, Antti; Smirnov, Stanislav

Convergence of Ising interfaces to Schramm's SLE curves. (Convergence des interfaces d'Ising vers les courbes SLE introduites par Schramm.) (English. French summary)

Zbl 1294.82007

C. R., Math., Acad. Sci. Paris 352, No. 2, 157-161 (2014).

The authors consider spin Ising and the Fortuin-Kasteleyn (FK)-Ising models on the square lattice \mathbb{Z}^2 , where the FK-Ising model is its random-cluster counterpart. The strong convergence of the interfaces in the planar critical Ising model is proved and its random-cluster representation of Schramm-Loewner evolution curves with the parameters $k = 3$ and $k = 16/3$, respectively.

Reviewer: [Nasir N. Ganikhodjaev \(Kuantan\)](#)

MSC:

- [82B20](#) Lattice systems (Ising, dimer, Potts, etc.) and systems on graphs arising in equilibrium statistical mechanics
- [60J67](#) Stochastic (Schramm-)Loewner evolution (SLE)
- [82B26](#) Phase transitions (general) in equilibrium statistical mechanics
- [82B27](#) Critical phenomena in equilibrium statistical mechanics

Cited in **3** Reviews
Cited in **65** Documents

Keywords:

[Ising interface](#); [FK-Ising model](#); [Schramm-Loewner evolution curve](#)

Full Text: [DOI](#) [arXiv](#) [Link](#)

References:

- [1] Aizenman, M.; Burchard, A., Hölder regularity and dimension bounds for random curves, *Duke Math. J.*, 99, 3, 419-453, (1999) · [Zbl 0944.60022](#)
- [2] Belavin, A. A.; Polyakov, A. M.; Zamolodchikov, A. B., Infinite conformal symmetry of critical fluctuations in two dimensions, *J. Stat. Phys.*, 34, 5-6, 763-774, (1984)
- [3] Chelkak, D., Robust discrete complex analysis: a toolbox, (2012), Preprint
- [4] D. Chelkak, H. Duminil-Copin, Clément Hongler, Crossing probabilities in topological rectangles for the critical planar FK Ising model, Preprint, [arXiv:1312.7785 \[math.PR\]](#), 2013.
- [5] Chelkak, D.; Hongler, C.; Izyurov, K., Conformal invariance of spin correlations in the planar Ising model, (2012), Preprint · [Zbl 1318.82006](#)
- [6] Chelkak, D.; Izyurov, K., Holomorphic spinor observables in the critical Ising model, *Commun. Math. Phys.*, 322, 2, 303-332, (2013) · [Zbl 1277.82010](#)
- [7] Chelkak, D.; Smirnov, S., Universality in the 2D Ising model and conformal invariance of fermionic observables, *Invent. Math.*, 189, 3, 515-580, (2012) · [Zbl 1257.82020](#)
- [8] Duminil-Copin, H.; Hongler, C.; Nolin, P., Connection probabilities and RSW-type bounds for the two-dimensional FK Ising model, *Commun. Pure Appl. Math.*, 64, 9, 1165-1198, (2011) · [Zbl 1227.82015](#)
- [9] Duminil-Copin, H.; Smirnov, S., Conformal invariance of lattice models, (Probability and Statistical Physics in Two and More Dimensions, *Clay Math. Proc.*, vol. 15, (2012), Amer. Math. Soc. Providence, RI), 213-276 · [Zbl 1317.60002](#)
- [10] Hongler, C., Conformal invariance of Ising model correlations, (2010), PhD thesis · [Zbl 1304.82013](#)
- [11] Hongler, C.; Smirnov, S., The energy density in the planar Ising model, *Acta. Math.*, 211, 2, 191-225, (2013) · [Zbl 1287.82007](#)
- [12] Kemppainen, A.; Smirnov, S., Random curves, scaling limits and Loewner evolutions, (2012), Preprint · [Zbl 1393.60016](#)
- [13] Lawler, G. F., Conformally invariant processes in the plane, *Mathematical Surveys and Monographs*, vol. 114, (2005), American Mathematical Society Providence, RI · [Zbl 1074.60002](#)
- [14] Lawler, G. F.; Schramm, O.; Werner, W., Conformal invariance of planar loop-erased random walks and uniform spanning trees, *Ann. Probab.*, 32, 1B, 939-995, (2004) · [Zbl 1126.82011](#)
- [15] Pommerenke, C., Boundary behaviour of conformal maps, *Grundlehren der Mathematischen Wissenschaften*, vol. 299, (1992), Springer-Verlag Berlin · [Zbl 0762.30001](#)

- [16] Schramm, O., Scaling limits of loop-erased random walks and uniform spanning trees, *Isr. J. Math.*, 118, 221-288, (2000) · [Zbl 0968.60093](#)
- [17] Smirnov, S., Towards conformal invariance of 2D lattice models, (*International Congress of Mathematicians*, vol. II, (2006), *Eur. Math. Soc. Zurich*), 1421-1451 · [Zbl 1112.82014](#)
- [18] Smirnov, S., Conformal invariance in random cluster models. I. holomorphic fermions in the Ising model, *Ann. Math.*, 172, 2, 1435-1467, (2010) · [Zbl 1200.82011](#)

This reference list is based on information provided by the publisher or from digital mathematics libraries. Its items are heuristically matched to zbMATH identifiers and may contain data conversion errors. It attempts to reflect the references listed in the original paper as accurately as possible without claiming the completeness or perfect precision of the matching.