

Intersection probabilities for a chordal SLE path and a semicircle

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Abstract

We derive a number of estimates for the probability that a chordal SLE path in the upper half plane H intersects a semicircle centred on the real line. We prove that if $0 < \kappa < 8$ and $\gamma: [0, \infty) \rightarrow \bar{H}$ is a chordal SLE in H from 0 to ∞ , then there exist constants K_1 and K_2 such that

$$K_1 r^{(4a-1)} < P(\gamma[0, \infty) \cap C(x; rx) \neq \emptyset) < K_2 r^{(4a-1)}$$

where $a=2/\kappa$ and $C(x; rx)$ denotes the semicircle centred at $x > 0$ of radius rx , $0 < r < 1/3$, in the upper half plane. As an application of our results, for $0 < \kappa < 8$, we derive an estimate for the diameter of a chordal SLE path in H between two real boundary points 0 and $x > 0$. For $4 < \kappa < 8$, we also estimate the probability that an entire semicircle on the real line is swallowed at once by a chordal SLE path in H from 0 to ∞ .

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Bibliography

1. Alberts, T. and Sheffield, S. Hausdorff dimension of the SLE curve intersected with the real line. To appear, *Electron. J. Probab.* Math. Review number not available.
2. Beffara, V. Hausdorff dimensions for SLE_κ . *Ann. Probab.* 32 (2004), 2606-2629. [MR2078552](#)
3. Dubédat, J. SLE and triangles. *Electron. Comm. Probab.* 8 (2003), 28-42. [MR1961287](#)
4. Garban, C. and Trujillo Ferreras, J.A. The expected area of the filled planar Brownian loop is $\pi/5$. *Comm. Math. Phys.* 264 (2006), 797-810. [MR2217292](#)
5. Kennedy, T. Monte Carlo Tests of Stochastic Loewner Evolution Predictions for the 2D Self-Avoiding Walk. *Phys. Rev. Lett.*, 88 (2003), 130601. Math. Review number not available.
6. Lawler, G.F. *Conformally Invariant Processes in the Plane*, volume 114 of *Mathematical Surveys and Monographs*. American Mathematical Society, Providence, RI, 2005. [MR2129588](#)
7. Rohde, S. and Schramm, O. Basic properties of SLE. *Ann. Math.* 161 (2005), 883-924. [MR2153402](#)
8. Schramm, O. Scaling limits of loop-erased random walks and uniform spanning trees. *Israel J. Math.* 118 (2000), 221-288. [MR1776084](#)
9. Schramm, O. A percolation formula. *Electron. Comm. Probab.* 6 (2001), 115--

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10. Schramm, O. and Zhou, W. Boundary proximity of SLE. Available online at [arXiv:0711.3350](#). Math. Review number not available.



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