

Thin Points for the Gaussian Free Field

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Abstract: Let U be a Jordan domain with smooth boundary on \mathbf{R}^2 . If F_U is the Gaussian free field on U and $D(z; r)$ is the disk centered at z with radius r , then for $\beta \in [2, 4]$, the Hausdorff dimension of the set of thin points z for which $\limsup_{r \downarrow 0} \log | \int_{D(z; r)} F_U d\xi | / \log r = \beta$ is $4 - \beta$ almost surely and $\sup_{z \in U} \limsup_{r \downarrow 0} \log | \int_{D(z; r)} F_U d\xi | / \log r = 4$ a.s.