p-harmonic measure in simply connected domains

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Abstract

In joint work with John Lewis and Kaj Nyström, we extend to simply-connected domains Makarov-type results about the Hausdorff dimension of p-harmonic measure pioneered by Lewis and Lewis-Bennewitz in the context of quasidisks.

The key to our analysis is a gradient estimate in terms of the distance to the boundary and constants that only depend on p. This is achieved by studying the conformal map from the unit disk to the simply connected domain to construct good quasicurves from an interior point to the boundary.