In this talk we study the Hausdorff dimension of a measure $\mu_f$ related to a positive weak solution, $u$, of a certain quasilinear elliptic partial differential equation in $\Omega \cap N$ where $\Omega \subset \mathbb{C}$ is a bounded simply connected domain and $N$ is a neighborhood of $\partial \Omega$. $u$ has continuous boundary value 0 on $\partial \Omega$ and is a positive weak solution to

$$\sum_{i,j=1}^{2} \frac{\partial}{\partial x_i} (f_{\eta_i \eta_j} (\nabla u(z)) u_{x_j}(z)) = 0 \text{ in } \Omega \cap N.$$ 

Also $f(\eta), \eta \in \mathbb{R}^2$ is homogeneous of degree $p$, $1 < p < 2$, and uniformly convex in the plane. Put $u \equiv 0$ in $N \setminus \Omega$. Then $\mu_f$ is the unique positive finite Borel measure, called generalized $p$–harmonic measure, with support on $\partial \Omega$.

Then it is shown that $\mu_f \ll \mathcal{H}^A$ for $1 < p < 2$ where

$$\lambda(r) = r \exp A \sqrt{\log 1/r \log \log \log 1/r}, \quad 0 < r < 10^6.$$ 

Our work generalizes work of Lewis in [L12] when the above PDE is the $p$-Laplacian, $1 < p < 2$, (i.e, $f(\eta) = |\eta|^p$) in the complete generalization.

[L12]: John Lewis. p-harmonic measure in simply connected domains revisited. Transactions of the American Mathematical Society, To appear. (Received February 04, 2014)