1086-35-2398 **Murat Akman*** (makman@ms.uky.edu), Department of Mathematics, University of Kentucky, Lexington, KY 40508, and **John L. Lewis**, Department of Mathematics, University of Kentucky, Lexington, KY 40508. *On the Dimension of a Certain Measure Arising From a PDE.* Preliminary report.

In this paper we study the Hausdorff dimension of a measure μ related to a positive weak solution, u, of a certain partial differential equation in $\Omega \cap N$ where $\Omega \subset \mathbb{C}$ is bounded simply connected domain and N is neighborhood of $\partial\Omega$, u has continuous boundary value 0 on $\partial\Omega$ and is a 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 $f(\eta)$, $\eta \in \mathbb{C}$ is homogeneous of degree p and ∇f is $\delta-$monotone on $\mathbb{C}$ for some $\delta > 0$. Put $u \equiv 0$ in $N \setminus \Omega$. Then μ is the unique positive finite Borel measure μ with support in $\partial\Omega$ satisfying

$$\int_{\mathbb{C}} \langle \nabla f(\nabla u(z)), \nabla \phi(z) \rangle dA = - \int_{\partial\Omega} \phi(z) d\mu$$

for every $\phi \in C_0^\infty(N)$.

Our work generalizes work of Lewis and coauthors when the above PDE is the p Laplacian (i.e, $f(\eta) = |\eta|^p$) and also for $p = 2$, the well known theorem of Makarov regarding the Hausdorff dimension of harmonic measure relative to a point in Ω. (Received September 26, 2012)