1093-35-240 **Henok Mawi*** (henok.mawi@howard.edu). *A Free Boundary Problem for a Higher Order Elliptic Operator.*

Let Ω be a domain in $\mathbb{R}^n$ with $0 \in \partial\Omega$. Suppose in B, the unit ball in $\mathbb{R}^n$, u and Ω solve the following equation in the sense of distributions:

$$Lu = \chi_\Omega \text{ in } B$$
$$D^\alpha u = 0 \text{ for } |\alpha| \leq 3 \text{ in } B \setminus \Omega.$$

Here L is a homogeneous fourth order elliptic operator, for instance, the Bi- Laplacian, and χ_Ω denotes the characteristic function.

We analyze the regularity properties of u. (Received August 16, 2013)