1108-82-409 **Kyle E Besing*** (`kebesing@uab.edu`). *Localization Properties of the Random Mass Laplacian.* Preliminary report.

Let $\Gamma = (V, E)$ be a connected graph of bounded degree. Let $k : V \to \mathbb{R}$, $m : V \to (0, \infty)$ and $b : E \to (0, \infty)$. An effective one-particle Hamiltonian, H, for a system of quantum harmonic oscillators is given by

$$H = m^{-\frac{1}{2}}(L + k)m^{-\frac{1}{2}} \tag{1}$$

where m and k denote the multiplication operators generated from m and k, respectively, and

$$(L\varphi)(x) = \sum_{y:\{x,y\}\in E} b(\{x, y\})(\varphi(x) - \varphi(y)). \tag{2}$$

Allowing any of these sequences to be i.i.d random variables produces interesting models to study. One can see that setting $b \equiv 1 \equiv m$ and defining k as a sequence of i.i.d. random variables gives the well-known Anderson model.

One of the models of interest, named the Random Edge Laplacian L_b, is given by assigning $m \equiv 1$, $k \equiv 0$, and allowing b to be a sequence of i.i.d random variables. Additionally, we want to study the model given by setting $b \equiv 1$, $k \equiv 0$, and defining m to be a sequence of i.i.d. random variables, to which we give the name the Random Mass Laplacian K_m. In this talk, we will focus on the latter model and some of the localization properties which can be shown via the Fractional Moment Method. (Received January 19, 2015)