ALMOST SHARP LOWER BOUND FOR THE NODAL VOLUME OF HARMONIC FUNCTIONS

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In this talk, I will discuss the relation between the growth of harmonic functions and their nodal volume. Let $u : \mathbb{R}^n \to \mathbb{R}$ be a harmonic function, where $n \geq 2$. One way to quantify the growth of u in the ball $B(0,1) \subset \mathbb{R}^n$ is via the *doubling index* N, defined by

$$\sup_{B(0,1)} |u| = 2^N \sup_{B(0,\frac{1}{2})} |u|.$$

I will present a result, obtained jointly with A. Logunov and A. Sartori, where we prove an almost sharp result, namely:

$$\mathcal{H}^{n-1}(\{u=0\} \cap B(0,2)) \gtrsim_{n,\varepsilon} N^{1-\varepsilon},$$

where $\mathcal{H}^{n-1}$ denotes the $(n-1)$ dimensional Hausdorff measure.