1128-28-25 **Kevin R. Vixie** and **Laramie S. Paxton*** (lpaxton@math.wsu.edu). *Cubical Coverings of sets in $\mathbb{R}^n$.*

Sets in $\mathbb{R}^n$ can be wildly unimaginable in their generality and abstractness, especially on their topological boundaries. Thus, mathematicians seek to develop methods to represent and characterize various classes of sets with more "friendly" sets, such as coverings. The focus of this work is on cubical coverings and what kinds of $\mathcal{L}^n$ or $\mathcal{H}^n$ bounds we can establish for these coverings in relation to their corresponding underlying sets as well as what assumptions are necessary. We first introduce and later explore three different representations of sets in $\mathbb{R}^n$: dyadic cubical coverings, Jones β numbers, and a new, "varifold-like" approach that we developed. We then present several inequalities for various classes of sets, including unions of balls, rectifiable sets with defined Minkowski content, and sets with "smooth" boundaries and positive reach. Lastly, we make a conjecture for a ratio of $\mathcal{H}^{n-1}$ boundary measures and pose further problems and questions for exploration with solutions to several. We note that we present old and new results with a view to illumination and exposition that we hope will motivate others to study these types of problems. (Received January 21, 2017)