# Some applications of recursion theory to geometric measure theory

Liang Yu
Nanjing University, China

**Abstract:** We present some applications of recursion theory to geometric measure theory. For example, for any real $d \in [0,1]$, we give a Kolmogorov complexity description for the set which is not $\sigma$-finite for the Hausdorff measure $\mathcal{H}^d$. As a conclusion, we show that under $ZFC + \neg CH + MA$, every $\Sigma^1_2$ set which is not $\sigma$-finite for $\mathcal{H}^d$ has a compact subset which is not $\sigma$-finite. Some other applications will also presented.