1063-42-262   **Izabella Laba*** (`ilaba@math.ubc.ca`), Department of Mathematics, UBC, Vancouver, BC
V6T1Z2, Canada. *Maximal operators and differentiation theorems for sparse sets.*

We study maximal averages associated with singular measures on $\mathbf{R}$. Our main result is a construction of singular Cantor-type measures in one dimension for which the corresponding maximal operators are bounded on L^p for all $p > 1$. As a consequence, we answer a question of Aversa and Preiss on density and differentiation theorems in one dimension. Our proof combines probabilistic techniques with methods developed in multidimensional harmonic analysis. (Joint work with Malabika Pramanik.) (Received August 17, 2010)