1057-46-293 **Svitlana Mayboroda*** (svitlana@math.purdue.edu), Department of Mathematics, Purdue University, 150 N. University Street, West Lafayette, IN 47907, and **Alexander Volberg**.

Boundedness of the square function and rectifiability.

A celebrated 1991 theorem of David and Semmes ascertains that the L^2-boundedness of all Caderón-Zygmund operators with respect to a Hausdorff measure H^s on a set E implies that s is an integer and E is rectifiable ("contains big pieces of Lipschitz graphs"). In the present work we establish that it is, in fact, sufficient to assume boundedness of a single operator, namely, the square function associated to the Riesz transform, in order to arrive to the same conclusion. (Received January 25, 2010)