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Steve C. Hofmann* (hofmann@math.missouri.edu), Dept. of Mathematics, University of Missouri, Columbia, MO 65211. *Local Tb Theorems and Applications in PDE.*

A Tb Theorem is a boundedness criterion for singular integrals, which allows the L^2 boundedness of a singular integral operator T to be deduced from sufficiently good behavior of T on some suitable non-degenerate test function b . However, in some PDE applications, including, for example, the solution of the Kato problem for square roots of divergence form elliptic operators, it may be easier to test the operator T locally (say on any given dyadic cube Q), on a test function b_Q that depends upon Q , rather than on a single, globally defined b . Or to be more precise, in the applications, it may be easier to find a family of b_Q 's for which Tb_Q is locally well behaved, than it is to find a single b for which Tb is nice globally. In this lecture, we'll discuss some versions of local Tb theorems, as well as some applications to PDE. (Received February 12, 2006)