Public Abstract
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We are surrounded by partial differential equations: from the flying plane, to a river nearby or the heat on the pan where we are cooking our breakfast. Their behavior is controlled by equations that will determine what they are going to "do" next.

There are plenty of studies that determine which kind of partial differential equation helps to understand the behavior of different phenomena as well as finding operators that solve such equations. Further studies are concentrated in the study and control of such operators. The goal of the local TB Theorem is to verify the behavior of the operator by testing such an operator locally (it's like trying to know the temperature of a pan by checking it's temperature at some particular spots).

In particular, we present some results for "square functions" where we don't know how the operator behaves at each point, but we have some control of its global behavior. We also apply such results to study the behavior of the "Single Layer Potential" which for example solves problems such as the charge density distribution in an electric field.

Generalizing the local TB theorems to operators for which we have less point-wise control will allow us to study a wider range of operators and determine the good behavior of the solutions of many different partial differential equations.