Resistance conditions and applications

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ABSTRACT: In this talk we study analytic aspects of so-called resistance conditions on metric measure spaces with a doubling measure. These conditions are weaker than the usually assumed Poincaré inequality, but however, they are sufficiently strong to imply several useful results in analysis on metric measure spaces. We show that under a perimeter resistance condition, the capacity of order one and the Hausdorff content of codimension one are comparable. Moreover, we have connections to the Sobolev inequality for compactly supported Lipschitz functions on balls as well as capacitary strong type estimates for the Hardy-Littlewood maximal function.