

## Local homogeneity and dimensions of measures

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**Abstract.** We introduce two new concepts, local homogeneity and local  $L^q$ -spectrum, both of which are tools that can be used to study the local structure of measures. Combining homogeneity and  $L^q$ -spectrum estimates, we introduce a new method to bound the local dimensions of measures in general doubling metric spaces. As an application, we reach a new level of generality and obtain many new results in the study of conical densities and porous measures in Euclidean spaces and also in general doubling metric spaces.

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