

# $C^{1,\alpha}$ REIFENBERG THEOREMS FOR SETS AND MEASURES

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ABSTRACT. We provide geometric sufficient conditions for one-sided Reifenberg flat sets in  $\mathbb{R}^n$  to be parametrized by a  $C^{1,\alpha}$  map. The conditions use a Jones type square function and all statements are quantitative in that the Hölder and Lipschitz constants of the parametrizations depend on such a function. We use these results to prove sufficient conditions for higher order rectifiability of sets and measures in  $\mathbb{R}^n$ . Key tools for the proof come from Guy David and Tatiana Toro's parametrization of Reifenberg flat sets (with holes) in the Hölder and Lipschitz categories.

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