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Jonas Aziz Azzam* (jonasazzam@math.washington.edu). *Quantitative differentiation of quasisymmetric maps in Euclidean space.*

For $f : \mathbb{R}^d \rightarrow \mathbb{R}^D$ quasisymmetric, we introduce a quantity $w_f(x, r)$ that (1) measures how close f is to being an affine map in the ball $B(x, r) \subseteq \mathbb{R}^d$ and (2) is invariant under translations and dilations in the domain of f as well as under rescalings of f in its image. We show that f has large bi-Lipschitz pieces of \mathbb{R}^d in its image (though the image may not be \mathcal{H}^d -finite) if and only if $w_f(x, r)^2 \frac{dxdr}{r}$ is a Carleson measure on $\mathbb{R}^d \times (0, \infty)$. Some cornerstones of the proof include David-Semmes theory, Dorronsoro's characterization of Sobolev spaces, and Semmes' work on strong A_∞ -weights. (Received July 23, 2013)