

1062-46-162

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Frequency of Sobolev and quasiconformal dimension distortion.

We study Hausdorff and Minkowski dimension distortion for images of generic affine subspaces of Euclidean space under Sobolev and quasiconformal maps. For a supercritical Sobolev mapping f defined on a domain in \mathbf{R}^n , we estimate from above the Hausdorff dimension of the set of affine subspaces parallel to a fixed m -dimensional linear subspace, whose image under f has positive \mathcal{H}^α measure for some fixed $\alpha > m$. As a consequence, we obtain new dimension distortion and absolute continuity statements valid for almost every affine subspace. Our results hold for mappings taking values in arbitrary metric spaces, yet are new even for quasiconformal maps of the plane. Our theory extends to cover mappings in Sobolev–Lorentz spaces as well as pseudomonotone mappings in the critical Sobolev class. In particular, we obtain new absolute continuity statements for quasisymmetric maps from Euclidean domains into metric spaces. (Received August 05, 2010)