

Exceptional sets for Sobolev and quasiconformal dimension distortion

Zoltan Balogh

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 R^n , we estimate from above the Hausdorff dimension of the exceptional set of affine subspaces parallel to a fixed m -dimensional linear subspace, whose image under f has positive cH^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, pseudomonotone mappings in the critical Sobolev class, and discrete and open mappings with integrable metric dilatation.