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Quantitative rigidity for almost isometric maps between Riemannian manifolds

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A classical result ('Liouville's theorem') states that a sufficiently regular map u in Euclidean space whose differential Du belongs to the group $SO(n)$ of orientation preserving isometries at every point is affine. The quantitative version of the result states that for maps of a bounded connected set U with Lipschitz boundary the L^2 distance of the differential Du from a constant can be bounded in terms of the L^2 distance of the differential from the set $SO(n)$. This result is a crucial ingredient in the analysis of the rigidity and flexibility of thin elastic objects. In the talk, which is based on joint work with Sergio Conti and Georg Dolzmann, I will discuss possible generalizations of the quantitative estimate in a Riemannian setting.

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