RIGIDITY OF POSITIVE SCALAR CURVATURE UNDER LOW REGULARITY

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We survey our joint results with Bernhard Hanke and Simone Cecchini on rigidity of positive scalar curvature if we use low regularity metrics and low regularity comparison maps. The main question is the following: given f: (X,h) -> (M,g) where (M,g) is a model Riemannian manifold (for example, the round sphere) and (X,h) is a Riemannian manifold with a possibly low regularity metric tensor. When is (M,g) scalar curvature rigid and under which conditions on f (and (X,h)).
The main result: f is 1-Lipschitz, h Lipschitz and the (distributional) scalar curvature of h is nowhere smaller than the scalar curvature of g. If f is additionally of non-zero degree and X spin, then f is necessarily an isometry.