Institut für Geometrie und Topologie

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Gap extremality for scalar curvature

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Abstract: Extremality and rigidity for scalar curvature have been extensively studied. Llarull proved the rigidity for scalar curvature on standard spheres. Goette and Semmelmann establish the extremality of Riemannian metrics with non-negative curvature operator, and Lott generalized this to manifold with smooth boundary. Dahl and Kroencke obtained scalar curvature rigidity of stable Einstein manifolds. In contrast, a generic metric on a closed manifold does not have scalar curvature extremality or rigidity properties. Thus, it is a natural question to estimate how much the scalar curvature can increase while the metric increases, and to investigate the gap extremality for scalar curvature. By applying the technique developed by Geotte-Semmelmann, we derived an upper-bound estimate for the infimum of the difference of scalar curvature for metrics without any constraint on the curvature operator. As an application, we obtained a gap extremality result for scalar curvature. Similar to Lott's work, we also derived estimates for scalar curvature and mean curvature for manifolds with smooth boundary. This is a joint work with Yukai Sun.

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