上記内容の英訳

I'm interested in the shape of a manifold endowed with a Riemannian metric structure, and the topology of some distinctive subspaces of the space of all Riemannian metrics, e.g., the space of positive scalar curvature metircs. The main method that I'm using is geometric analysis, especially Ricci flows. I'm also interested in Ricci flows themselves and study the behavior of them. I'll concisely explain my studies as follows.

- S. Hamanaka, Decompositions of the space of Riemannian metrics on a compact manifold with boundary, Calc. Var. Partial differential Equations 60, 1-24 (2021). **(Peer-reviewed)**

  In this paper, I extended the Koiso's decomposition theorem (on a closed manifold) to one on a manifold with boundary.

- S. Hamanaka, Non-Einstein relative Yamabe metrics, Kodai Math. J. 44, 265-272 (2021). **(Peer-reviewed)**

  In this paper, I gave a sufficient condition for a constant scalar curvature metric with minimal boundary to be a relative Yamabe metric. Here, a relative Yamabe metric is the one corresponding to a solution of the Yamabe problem with minimal boundary condition.

- S. Hamanaka, Ricci flow with bounded curvature integrals, Pacific J. Math. 314, 283-309 (2021). **(Peer-reviewed)**

  In this paper, I proved that if a Ricci flow on a closed manifold satisfies a condition characterized as some integral forms, then as the time approaches the first finite singular time, the metric converges to a Riemannian metric on the manifold except for finitely many singular points. I also showed that such a flow can be extended over the singular time as a orbifold Ricci flow.

- S. Hamanaka, Type of finite time singularities of the Ricci flow with bounded scalar curvature, arXiv:2105.08250 (2021). **(Not peer-reviewed)**

  In this paper, I showed that the shape of finite-time singularities of a Ricci flow on a closed manifold with bounded scalar curvature are restricted in some sense.

- S. Hamanaka, C^0, C^1-limit theorems for total scalar curvatures, arXiv:2208.01865 (2022). **(Not peer-reviewed)**

  In this paper, I particulary proved the following: Let $\mathcal{M}$ be the space of all Riemannian metrics on a closed manifold. Then, for any nonnegative continuous function σ and constant κ, the space

  $$\left\{ g \in \mathcal{M} \;\middle|\; \int_M R(g)\, d\mathrm{vol}_g \geq \kappa,\ R(g) \geq \sigma \right\}$$

  is closed in $\mathcal{M}$ with respect to C^1-topology.

- S. Hamanaka, Upper bound preservation of the total scalar curvature in a conformal class, in preparation. **(Not peer-reviewed)**

  In this paper, I particulary proved the following: Let $g_0 \in \mathcal{M}$. Then, for any continuous function σ and constant κ, when the conformal class $[g_0]$ of g_0 is Yamabe positive or nonpositive respectively,

  $$\left\{ g \in [g_0] \;\middle|\; \int_M R(g)\, d\mathrm{vol}_g \leq \kappa,\ R(g) \geq \sigma \right\}, \quad \left\{ g \in [g_0] \;\middle|\; \int_M R(g)\, d\mathrm{vol}_g \leq \kappa \right\}$$

  are closed in $\mathcal{M}$ with respect to C^0-topology respectively.