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Mathematics > Differential Geometry

Optimal Riemannian metric for a volumorphism and a mean ergodic theorem in complete global Alexandrov nonpositively curved spaces

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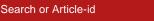
In this paper we give a natural condition for when a volumorphism on a Riemannian manifold \$(M,g)\$ is actually an isometry with respect to some other, optimal, Riemannian metric \$h\$. We consider the natural action of volumorphisms on the space \$\M_\mu^s\$ of all Riemannian metrics of Sobolev class \$H^s\$, \$s>n/2\$, with a fixed volume form \$\mu\$. An optimal Riemannian metric, for a given volumorphism, is a fixed point of this action in a certain complete metric space containing \$\M_\mu^s\$ as an isometrically embedded subset. We show that a fixed point exists if the orbit of the action is bounded. We also generalize a mean ergodic theorem and a fixed point theorem to the nonlinear setting of complete global Alexandrov nonpositive curvature spaces.

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