The Ricci flow for connections

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Abstract

We define the Ricci flow for connections. It is a natural notion.

1 The usual Ricci flow

The usual Ricci flow is defined for metrics over Riemannian manifolds. The Ricci tensor Ric is a contraction of the Riemann curvature tensor. The flow is:

$$\frac{\partial g}{\partial t} = -2Ric(g)$$

2 The Ricci flow for connections

For a set of connections ∇^t over the tangent fiber bundle of a Riemannian manifold (M, g) of dimension n, we define a Ricci flow:

$$\frac{\partial \nabla^t_X Y}{\partial t} = \nabla^t_X Ricc(Y) - Ricc(\nabla^t_X Y) - \frac{dr(X)}{n} Y$$

$Ricc$ is the Ricci endomorphism of ∇^t and r is the scalar curvature.

3 Bibliography

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