

The Riemann flow

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November 15, 2019

Abstract

The Riemann flow is defined with help of the riemannian curvature.

1 The Ricci flow

The Ricci flow is a flow for the metrics g of a riemannian manifold M [GHL]. It is defined with help of the Ricci curvature $Ric(g)$ which is a contraction of the riemannian curvature R_g [T].

$$r_g(x, y, z, t) = g(R_g(x, y)z, t)$$

$$Ric(g)(x, y) = \sum_i r_g(x, e_i, y, e_i)$$

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

2 The Riemann flow

The Riemann flow is defined for the metrics g with help of the riemannian curvature [GHL] by the following equation:

$$\frac{\partial}{\partial t} [g(x, x)g(y, y) - g(x, y)^2] = r_g(x, y, x, y)$$

References

- [GHL] S.Gallot, D.Hulin, J.Lafontaine, "Riemannian geometry", 3ed., Springer, Berlin, 2004.
- [T] P.Topping, "Lectures on the Ricci flow", Cambridge University Press, Cambridge, 2006.