The Chern Flow

A.Balan

May 16, 2019

Abstract

We propose a flow over Kaehlerian manifolds.

1 Kaehlerian manifolds

The Kaehler manifolds are complex manifolds with compatible Riemannian metrics in the sense that the complex structure is parallel by the Levi-Civita connection of the metric.

2 Einstein manifolds

For the Kaehler manifolds, the Einstein equations are expressed as:

\[ \omega = \text{tr}(R_J) \]

\( \omega \) is the symplectic form and \( R_J \) is the twisted Riemannian curvature. The Ricci flow is:

\[ \dot{\omega} = \text{tr}(R_J) \]

3 The Chern flow

The Chern characteristic classes are:

\[ c_k = \text{tr}(R^k) \]

The Chern flow over a Kaehler manifold is defined as:

\[ \dot{\omega} \wedge \omega = \text{tr}(R^2) \]

\( R \) is the Riemann curvature. More generally, we can define the flows:

\[ \dot{\omega} \wedge \omega^k = \text{tr}(R^{k+1}) \]

4 Bibliography