

The homogeneous Ricci flow on flag manifolds with three isotropy summands

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Abstract. For flag manifolds with 3 isotropy summands, we provides a complete description of the homogeneous Ricci flow: phase portrait and basins of attractions, including collapsing phenomena.

We use a dynamical approach that considerably simplifies the problem by appropriately projecting the Ricci flow in the positive orthant of \mathbb{R}^3 to a flow in the 2-dimensional simplex $x + y + z = 1$, so that Einstein metrics become fixed points of the projected flow. Then we use techniques from planar dynamical systems and Lie theory to proceed a case by case analysis of the phase portrait of the projected Ricci flow, for each flag manifold with three isotropy summands: there are 2 infinite families and 8 exceptional cases of such manifolds.

When the metric evolves to a degenerate one in the boundary of the above simplex, we show that the flag manifold collapses to another homogeneous space, in the sense of Gromov-Hausdorff convergence of metric spaces. Depending on the initial metric, the collapse happens either on the fiber or on the base of an appropriate projection from the flag manifold.

This is joint work with Lino Grama (Unicamp), Ricardo Miranda (Unicamp), Mauro Patrão (UnB) and Llohan Sperança (Unifesp).

References

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