Helliwell, Dylan

Bach flow on homogeneous products. (English) [Zbl 1436.53078]

Summary: Qualitative behavior of Bach flow is established on compact four-dimensional locally homogeneous product manifolds. This is achieved by lifting to the homogeneous universal cover and, in most cases, capitalizing on the resultant group structure. The resulting system of ordinary differential equations is carefully analyzed on a case-by-case basis, with explicit solutions found in some cases. Limiting behavior of the metric and the curvature are determined in all cases. The behavior on quotients of \( \mathbb{R} \times S^3 \) proves to be the most challenging and interesting.

MSC:
53E99 Geometric evolution equations
53E20 Ricci flows
53C30 Differential geometry of homogeneous manifolds
34C40 Ordinary differential equations and systems on manifolds

Keywords:
high-order geometric flows; Bach flow; locally homogeneous manifold; three-dimensional Lie group

Full Text: DOI

References:
[1] article {BahuaudHelliwell1, AUTHOR = {Bahuaud, Eric and Helliwell, Dylan, Short-time existence for some higher-order geometric flows, Communications in Partial Differential Equations, 36, 12, 2189-2207, (2011) · Zbl 1242.53079
[3] nics (Bour, V., Fourth order curvature flows and geometric applications, (None)
[8] article {GGI, AUTHOR = {Gimre, Karsten and Guenther, Christine and Isenberg, James, Second-order renormalization group flow of three-dimensional homogeneous geometries, Communications in Analysis and Geometry, 21, 2, 435-467, (2013) · Zbl 1275.53057
[12] article {HJL, AUTHOR = {Isenberg, James and Jackson, Martin and Lu, Peng, Ricci flow on locally homogeneous closed 4-manifolds, Communications in Analysis and Geometry, 14, 2, 345-386, (2006) · Zbl 1121.53045
[14] article {KM, AUTHOR = {Knopf, Dan and McLeod, Kevin, Quasi-convergence of model geometries under the (R)cci flow, Communications in Analysis and Geometry, 9, 4, 879-919, (2001) · Zbl 1020.53044
[16] book {Jack2, AUTHOR = {Lee, John M., Introduction to smooth manifolds, Graduate Texts in Mathematics, 218, xvi+708,

[18] article {Milnor, AUTHOR = {Milnor, John, Curvatures of left invariant metrics on Lie groups, Advances in Mathematics, 21, 3, 293-329, (1976) · Zbl 0341.53030


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