



Mathematics > Differential Geometry

# A mass-decreasing flow in dimension three

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In this article, we introduce a mass-decreasing flow for asymptotically flat three-manifolds with nonnegative scalar curvature. This flow is defined by iterating a suitable Ricci flow with surgery and conformal rescalings and has a number of nice properties. In particular, wormholes pinch off and nontrivial spherical space forms bubble off in finite time. Moreover, a noncompact variant of the Perelman-energy is monotone along the flow. Assuming a certain inequality between the mass and this Perelman-energy a priori, we can prove that the flow squeezes out all the initial mass.

Comments: 13 pages (v2: added section about continuum limit; minor additional improvements)

Subjects: **Differential Geometry (math.DG)**; General Relativity and Quantum Cosmology (gr-qc)

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