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New convergence results for the Ricci flow II (Pinching families and three manifolds with positive Ricci curvature)

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Abstract

In this talk we prove a general convergence result for the Ricci flow. A pinching family is a continuous family of cones $C(t)$ $\big(t \in [0,1)\big)$ in the finite dimensional vectorspace of algebraic curvature operators such that each cone defines—by means of Hamiltions maximum principle—a Ricci flow invariant curvature condition, and $C(t)$ converges to multiples of the identity as $t \to 1$. We show that the existence of a pinching family is enough to prove a convergence result for the Ricci flow. Since it is easy to see that there is a pinching family with $C(0)$ being the cone of 3-dimensional curvature operators of nonnegative Ricci curvature, we obtain as a corollary Hamilton's classification of 3-dimensional manifolds with positive Ricci curvature.