1070-53-247      **Brett Lawrence Kotschwar*** (`brett.kotschwar@aei.mpg.de`), MPI for Gravitational Physics, Am Mühlenberg 1, Golm, D-14476. *Ricci flow and the holonomy group.*

We prove that the restricted holonomy group of a complete smooth solution to the Ricci flow of uniformly bounded curvature cannot spontaneously contract in finite time; it follows then from existing results that the holonomy group is exactly preserved by the equation. The non-contraction of holonomy has some geometric consequences, among them that $g(T)$ can only be Kähler or locally reducible (as a product) if the same is true of $g(t)$ at times $t < T$. We reduce the problem to one of backwards uniqueness for a certain coupled PDE-ODE system through the interpretation of the evolution equations of certain quantities derived from the metric in terms of the natural Lie bracket on two-forms. The backwards uniqueness of this system then follows from a earlier general result of the author. As the estimates for this result measure – and, in principle, limit – the rate at which the curvature operator can asymptotically "acquire" null directions, we have hope that these estimates (or improvements thereof) may have application in future work to analysis up to and including the singular time. (Received February 14, 2011)

1