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I Barkas, S Kong and L Ni* (lni@math.ucsd.edu). *Ancient solutions to the Ricci flow.*

In this paper we present ancient solutions to Ricci flow on spheres and complex projective spaces which generalize Fateev's examples on three spheres. We also study in detail the geometric and asymptotic properties of Fateev's three dimensional examples. Our higher dimensional examples on the total space of the generalized Hopf fibrations, as well as Fateev's three dimensional examples on \mathbb{S}^3 , supply counter-examples to some folklore conjectures on ancient solutions of Ricci flow on compact manifolds. Our high dimensional examples are mostly non-collapsed. As a by-product, we showed that the nonstandard Einstein metrics on spheres and complex projective spaces are unstable fixed points of the Ricci flow. (Received February 21, 2010)