1021-41-142 **Panagiota Daskalopoulos** and **Natasa Sesum*** (natasas@math.columbia.edu), 2990 Broadway, Department of Mathematics, New York, NY 10027. *On the extinction profile of solutions to the fast diffusion.*

We consider the initial value problem $u_t = \Delta \log u$, $u(x,0) = u_0(x) \geq 0$ in $\mathbf{R}^2$, corresponding to the Ricci flow, namely conformal evolution of the metric $u(dx_1^2 + dx_2^2)$ by Ricci curvature. It is well known that the maximal (complete) solution u vanishes identically after time $T = \frac{1}{4\pi}\int_{R^2} u_0$. Assuming that u_0 is compactly supported we describe precisely the Type II vanishing behavior of u at time T: we show the existence of an inner region with exponentially fast vanishing profile, up to proper scaling, a *soliton cigar solution*, and the existence of an outer region of persistence of a logarithmic cusp. This is the only Type II singularity which has been shown to exist, so far, in the Ricci Flow in any dimension. It recovers rigorously formal asymptotics derived by J.R. King. (Received September 02, 2006)