1037-35-83 **C. Y. Chan** and **P. Tragoonsirisak*** (pxt6365@louisiana.edu), Department of Mathematics, University of Louisiana at Lafayette, Lafayette, LA 70504-1010. *Computation of the critical coefficient in a multi-dimensional quenching problem with a logarithmic singularity in* $\mathbb{R}^N$.

We study the following multi-dimensional semilinear parabolic first initial-boundary value problem,

$$u_t - \triangle u = \alpha (1 + |x|)^m \left(-\frac{\ln (1-u)}{u} \right) \text{ in } \mathbb{R}^N \times (0, T],$$
$$u(x, 0) = 0 \text{ for } x \in \mathbb{R}^N,\ u(x, t) \to 0 \text{ as } |x| \to \infty \text{ for } 0 < t \leq T,$$

where α, m and T are real numbers such that $\alpha > 0$ and $T > 0$. For $N \geq 3$ and $m < -2$, it is shown that there exists a unique critical coefficient α^* such that u exists globally for $\alpha < \alpha^*$ and quenches in a finite time for $\alpha > \alpha^*$. A computational method for finding α^* is devised. (Received January 23, 2008)