

1056-35-312

Patcharin Tragoonsirisak* (tragoonsirisakp@fvsu.edu), Dep. of Mathematics and Computer Science, Fort Valley State University, Fort Valley, GA 31030. *Blow-up phenomena due to concentrated nonlinear sources in \mathbb{R}^N .*

A multi-dimensional semilinear parabolic problem with a nonlinear source on the surface ∂B of a N -dimensional ball is studied. It is shown that the problem has a unique nonnegative continuous solution u before blow-up occurs. If u blows up in a finite time, then under additional conditions on the initial data, it blows up everywhere on ∂B only. It is proved that u always blows up in a finite time for $N \leq 2$, and blow-up can be prevented for $N \geq 3$. The effect of the source strength on the blow-up phenomena is investigated. (Received August 27, 2009)