Asymptotic Behavior of Semilinear Heat Equations with Critical Sobolev Exponent

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In this paper we concern with the asymptotic behavior of global solutions of semilinear heat equations of the following form:

$$u_t = \Delta u + u^p \qquad (x,t) \in \quad \times (0,T)$$

$$u(x,t) = 0 \qquad (x,t) \in \partial \quad \times (0,T), \qquad u(x,0) = u_0,$$

where is a bounded domain in $R^N (N \geq 3)$ and $p = 2^* - 1 = \frac{N+2}{N-2}$, 2^* is the critical Sobolev exponent. We use the concentration compactness principle to describe exactly the asymptotic profile of unbounded, global solution which was first obtained by Ni, Sacks and Tavantzis if $= ball$ and $u_0(x) = u_0(|x|)$.