ON THE NONLINEAR DIFFUSION EQUATION OF KOLMOGOROV-PETROVSKII-PISKUNOV TYPE

Yoshinori KAMETAKA

Contents

	Page

Introduction

Kolmogorov, Petrovskii and Piskunov [1], whom we shall refer to as KPP, studied the initial value problem for a semilinear diffusion equation

(1)
$$\begin{cases} Lu = f(u), & 0 \leqslant u \leqslant 1 \quad (x, t) \in R^1 \times (0, \infty), \\ u(x, 0) = u_0(x) & x \in R^1, \end{cases}$$
$$\left(\text{where } L = \frac{\partial}{\partial t} - \left(\frac{\partial}{\partial x} \right)^2, \quad u = u(x, t), \right)$$

under the conditions:

(i) $f(\xi) \in C^\infty[0, 1]$,

(ii) $f(0) = f(1) = 0, \quad f'(0) > 0 > f'(1)$,

(iii) $f(\xi) > 0, \quad f_0(\xi) \equiv f'(0)\xi - f(\xi) \geqslant 0 \quad \xi \in (0, 1)$.