Dynamics of Continuous, Discrete and Impulsive Systems
Series **A:** *Mathematical Analysis* **8 (2001)** 291-303

ABSTRACT SEMILINEAR FUNCTIONAL DIFFERENTIAL EQUATIONS OF RETARDED TYPE

K. Ezzinbi and H. Tamou

Université Cadi Ayyad
Faculté des Sciences Semlalia
Département de Mathématiques
B.P.S.15, Marrakech, Morocco
e-mail: fssm.math@casanet.net.ma

Abstract. In this work, we study the problem of existence and uniqueness of solutions for some abstract semilinear functional differential equations of retarded type.
AMS (MOS) subject classification: 34K30

1 Introduction

Abstract semilinear functional differential equations arise from many biological, chemical and physical systems which are characterized by both spatial and temporal variables and which various spatio-temporal patterns. However, most existing result on abstract functional differential equations are scattered through the research journals and these results have been obtained by using various methods concepts and results from the semigroup theory, the dynamical system theory, linear and nonlinear functional analysis, ordinary and partial differential equations, and functional differential equation. This makes it difficult for a new coner to enter into this important research field.

By an abstract semilinear functional differential equations, we mean an evolution systems described by

$$\frac{du(t)}{dt} = Au(t) + F(t, u_t), \text{ for } t \geq 0, \tag{1}$$

where $A : D(A) \subset E \to E$ is a linear operator on a Banach space E, F is E-valued nonlinear mapping defined on $C = C([-\tau, 0]; E)$ (the space of all continuous function on $[-r, 0]$ with the uniform norm topology), and $u_t \in C$ is defined by

$$u_t(\theta) = u(t + \theta), \text{ for } \theta \in [-\tau, 0],$$

τ is a positive constant.
Several classes of differential equations such as reaction diffusion equations