EXISTENCE RESULTS FOR IMPULSIVE PERTURBED PARTIAL NEUTRAL FUNCTIONAL DIFFERENTIAL EQUATIONS IN FRECHET SPACES

D. N. Chalishajar^{a} [1], K. Karthikeyan^{b}, A. Anguraj^{c}

^{a}Department of Applied Mathematics
431 Mallory Hall, Virginia Military Institute
Lexington, VA 24450, USA
E-mail: *dipu17370@yahoo.com, chalishajardn@vmi.edu*
^{b}Department of Mathematics
KSR College of Technology
Tiruchengode-637215, TamilNadu, India
E-mail: *karthi_phd2010@yahoo.co.in*
^{c}Department of Mathematics
PSG College of Arts and Science
Coimbatore 641 014, Tamil Nadu, India
E-mail: *angurajpsg@yahoo.com*

Abstract. In this paper, we prove the existence of mild solutions for first-order impulsive neutral functional perturbed differential equations with infinite delay. Our main tools are the recently found nonlinear alternative by Avramescu for the sum of contractions and completely continuous maps in Frechet spaces and the semi-group theory. Also we claim that the phase space considered by several authors is not correct and we give a new definition of the phase space. An example is given to illustrate the theory.

Keywords: Perturbed neutral impulsive differential equations, fixed point theory, nonlinear alternative, infinite delay, Frechet spaces.

AMS Subject Classifications: 34A37, 34G20, 47H20.

1　Introduction

The theory of impulsive differential equations is an important branch of differential equations, which has an extensive physical background, see for instance [12, 20, 21, 23, 26]. Neutral differential equations arise in many areas of applied mathematics and for this reason these equations have received much attention in the last few decades.

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[1]Corresponding author.