Nonlinear Dynamics and Systems Theory, **17** (4) (2017) 409–420

Pseudo Almost Automorphic Mild Solutions to Some Fractional Differential Equations with Stepanov-like Pseudo Almost Automorphic Forcing Term

Vikram Singh [1*] and Dwijendra N. Pandey [1]

[1] *Department of Mathematics, Indian Institute of Technology Roorkee Roorkee*-247667*, India*

Received: January 12, 2017; Revised: October 23, 2017

Abstract: In this paper, we show the existence of (μ,ν)-pseudo almost automorphic mild solutions to some fractional differential equations in light of measure theory in a Banach space with new concept of Stepanov-like (μ,ν)-pseudo almost automorphy by virtue of Leray-Schauder alternate theorem.

Keywords: *almost automorphic and* (μ,ν)*-pseudo almost automorphic functions; Stepanov-like* (μ,ν)*-pseudo almost automorphic functions; mild solution; sectorial operator; solution operator; fractional differential equation.*

Mathematics Subject Classification (2010): 43A60, 26A33, 34C27, 28D05.

1 Introduction

In recent years, fractional differential equations with almost automorphic solutions have gained considerable interest. This is due to the fact that fractional differential equations are powerful tools to describe the hereditary properties and memory of various materials. Fractional differential equations have great applications in nonlinear oscillations of earthquakes, fractal theory, diffusion in porous media, viscoelastic panel in super sonic gas flow. For more details, we refer to the papers [2, 3, 8, 9, 18] and references therein.

The concept of almost automorphy was first introduced by Bochner [6]. Afterwards, being a most attractive topic in qualitative theory of differential equations, the theory of classical almost automorphy has been studied extensively by numerous authors and

* Corresponding author: mailto:vikramiitr1@gmail.com