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# EXISTENCE RESULTS FOR FRACTIONAL NON-INSTANTANEOUS IMPULSIVE INTEGRO-DIFFERENTIAL EQUATIONS WITH NONLOCAL CONDITIONS

A. Anguraj[1] and S. Kanjanadevi[2]

[1,2]Department of Mathematics,
PSG College of Arts and Science, Coimbatore-641 014, Tamil Nadu, India

**Abstract.** In this work we present the existence results for non-instantaneous impulsive fractional integro-differential equations with non-local conditions. The mild solution of the problem is derived by using resolvent operator technique and the existence of solution is proved by using the fixed point theorem of condensing map.

**Keywords.** Fractional differential equations, Non instantaneous impulse, Resolvent operator, Fixed point theorem.

**AMS (MOS) subject classification:** 35R11, 34K45, 34A37

## 1 Introduction

In recent years fractional differential equations play an important role in the theory of science and engineering, due to its hereditary properties of various materials and memory processes. Moreover, we can find wide applications in viscoelasticity, electrochemistry, porous media, electromagnetic, etc. Fractional differential equation is also considered as an alternative model to nonlinear differential equations. For more details about fractional differential equations and its applications refer [8, 11, 12, 19, 21, 26, 31].

The study of impulsive differential equations have more attention in recent years due to its applications. Most of the research papers dealt with instantaneous impulses, see for more details [1, 2, 6, 7, 13, 20, 22, 24, 28]. On the other hand, we came to know from the semigroup theory that many authors used the concept of mild solutions for fractional impulsive differential equations inappropriately, see [4, 18, 27, 29]. To make the concept of mild solutions more appropriate, E. Hernández et al [16] treated abstract differential equations with fractional derivatives in time, based on the well developed theory of resolvent operators for integral equations [32].

Recently, Hernández and O'regan in [15] introduced a new class of impulsive differential equations. In the model presented in [15], the impulses