Waheed, Hira; Zada, Akbar; Xu, Jiafa

Well-posedness and Hyers-Ulam results for a class of impulsive fractional evolution equations. (English) Zbl 1469.35237

Summary: In this work, we establish a new class of nonlinear implicit fractional evolution equation with integrable impulses. We investigate the qualitative properties of $\mathcal{PC}$-mild solution of the proposed problem. The results are obtained using the theory of probability density functions, operators semigroup, and fixed-point criteria. The main theoretical results are well demonstrated with the help of an example.

MSC:

- 35R12 Impulsive partial differential equations
- 26A33 Fractional derivatives and integrals
- 34A08 Fractional ordinary differential equations
- 34A12 Initial value problems, existence, uniqueness, continuous dependence and continuation of solutions to ordinary differential equations
- 34A37 Ordinary differential equations with impulses
- 34K40 Neutral functional-differential equations
- 35K90 Abstract parabolic equations
- 35R11 Fractional partial differential equations

Keywords:
Diaz-Margolis’s fixed-point theorem; fractional evolution equation; noninstantaneous impulses; $\mathcal{PC}$-mild solutions; Ulam-type stability

Full Text: DOI