

On a study of Sobolev type fractional functional evolution equations

Ismail T. Huseynov¹, Arzu Ahmadova¹, and Nazim Mahmudov¹

¹Eastern Mediterranean University

March 13, 2021

Abstract

Sobolev type fractional functional evolution equations have many applications in the modeling of many physical processes. Therefore, we investigate fractional-order time-delay evolution equation of Sobolev type with multi-orders in a Banach space and introduce an analytical representation of a mild solution via a new delayed Mittag-Leffler type function which is generated by linear bounded operators. Furthermore, we derive an exact analytical representation of solutions for multi-dimensional fractional functional dynamical systems with nonpermutable and permutable matrices. We also study stability analysis of the given time-delay system in Ulam-Hyers sense with the help of Laplace transform.

Hosted file

Sobolev-delay-last.pdf available at <https://authorea.com/users/401265/articles/513414-on-a-study-of-sobolev-type-fractional-functional-evolution-equations>