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An analytic resolvent Approach to the control of Ψ -Fractional dynamical systeme

Communication Info

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Abstract

The controllability fractional differential equations governed by a linear closed operator that generates a resolvent family. is investigated via the Caputo fractional derivative with respect to a strictly increasing function Ψ . This generalized operator, introduced in [1] and developed in [2]. By employing analytic resolvent theory together with continuity properties in the uniform operator topology, we derive novel criteria that guarantee both the existence of solutions and the approximate controllability of the corresponding fractional control system [3]

This established existence and approximate controllability results for Ψ -fractional systems generated by analytic resolvents. Using a framework based on Ψ -Caputo derivatives, generalized fractional integrals, and Ψ -Laplace [4] transforms, we derived explicit solution formulas and proved existence via fixed-point methods.

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