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Controllability Results of Mild Solutions for Second-Order Functional Evolution Equations with Finite State-Dependent Delay

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Abstract

This work investigates the controllability of mild solutions for a class of second-order semilinear partial functional evolution equations with finite state-dependent delay. Using Avramescu's nonlinear alternative for the sum of compact and contraction operators in Fréchet spaces, we establish sufficient conditions for the existence and controllability of mild solutions. The analysis is based on fixed-point theory combined with semigroup methods.

keywords : Second order evolution equations, mild solution, controllability, state-dependent delay, fixed point, cosine function of operators.

Mathematics Subject Classification : 03C85, 34G20, 37L05, 47D09, 93B05.

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