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Existence and Asymptotic Properties of Solutions for Semilinear Integrodifferential Equations with Nonlocal Conditions

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Abstract

In this talk, we consider a class of semilinear integrodifferential equations with state-dependent nonlocal conditions on a semi-infinite interval in Banach spaces. These equations involve nonlinear terms depending on implicit spatial derivatives of the state variable. The global existence of solutions is first established using fractional power operators, resolvent operator theory, the Kuratowski measure of noncompactness, and fixed-point theory. In particular, the compactness of the resolvent operator is not required. Moreover, under certain assumptions, the existence of quasi-invariant sets and globally attracting sets of solutions is investigated. Finally, an example is presented to illustrate the applicability of the main results.

Mathematics Subject Classification : 34G20; 34K30; 34K10.

Keywords: Semi-infinite interval, integrodifferential equations, measures of noncompactness, global attracting sets, resolvent operator, quasi-invariant sets, nonlocal conditions.

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