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Nonlocal problems for integrodifferential equations. (English) Zbl 1163.45010
Dyn. Contin. Discrete Impuls. Syst., Ser. A, Math. Anal. 15, No. 6, 815-824 (2008).

The paper deals with the nonlocal Cauchy problem for the nonlinear integrodifferential equation

$$u'(t) = Au(t) + \int_0^t B(t-s)u(s) ds + f(t, u(t)), \quad 0 \leq t \leq T, \quad (1)$$

$$u(0) = u_0 + g(u), \quad (2)$$

in a Banach space X , where $A : D(A) \subset X \rightarrow X$ is a densely defined, closed linear operator that generates a C_0 -semigroup $\{T(t), t \in [0, T]\}$, $\{B(t), t \in [0, T]\}$ is a family of continuous linear operators from $D(A)$ into X , the function $f : [0, T] \times X \rightarrow X$ is continuous and the operator $g : C([0, T] \times X) \rightarrow X$ is compact, which satisfy some additional assumptions. The authors prove that the resolvent operator $R(t)$ of equation (1) is continuous in the uniform operator topology, for $t > 0$, and then they establish the existence of mild solutions of the problem (1)–(2), by using Schaefer's fixed point theorem.

Reviewer: [Rodica Luca Tudorache \(Iași\)](#)

MSC:

[45N05](#) Abstract integral equations, integral equations in abstract spaces
[45J05](#) Integro-ordinary differential equations
[45G10](#) Other nonlinear integral equations

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Keywords:

nonlocal Cauchy problems; nonlinear integrodifferential equations; compact resolvent operators; mild solutions; Schaefer's fixed point theorem; Banach space