

Liu, James H.

Nonlinear impulsive evolution equations. (English) Zbl 0932.34067
Dyn. Contin. Discrete Impulsive Syst. 6, No. 1, 77-85 (1999).

Summary: The author studies existence and uniqueness of mild and classical solutions to nonlinear impulsive evolution equations

$$u'(t) = Au(t) + f(t, u(t)), \quad 0 < t < T_0, \quad t \neq t_i, \quad u(0) = u_0,$$

$$\Delta u(t_i) = I_i(u(t_i)), \quad i = 1, 2, \dots, \quad 0 < t_1 < t_2 < \dots < T_0,$$

in a Banach space X , where A is the generator of a strongly continuous semigroup, $\Delta u(t_i) = u(t_i^+) - u(t_i^-)$ and I_i 's are some operators. The impulsive conditions can be used to model more physical phenomena than the traditional initial value problems $u(0) = u_0$. The author applies the semigroup theory to study existence and uniqueness of the mild solutions, and to show that the mild solutions give rise to classical solutions if f is continuously differentiable.

MSC:

[34G20](#) Nonlinear differential equations in abstract spaces
[34A37](#) Ordinary differential equations with impulses

Cited in **1** Review
Cited in **83** Documents

Keywords:

existence; uniqueness; mild and classical solutions; nonlinear impulsive evolution equations