NON LOCAL INITIAL VALUE PROBLEMS FOR EVLUTION NCLUSIONS

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1. ABSTRACT

We study a class of multivalued perturbations of m-dissipative evolution inclusions with non local initial condition in Banach spaces in the form:

$$\begin{cases} \dot{x} \in Ax + f_x(t), \ t \in I = [t_0, T], \\ f_x(t) \in F(t, x(t)), \\ x(t_0) = g(x(\cdot)) \in \overline{D(A)}. \end{cases} \qquad (1.1)$$

Where $A : D(A) \longrightarrow X$ is m-dissipative operator, while F:$I \times X \longrightarrow X$ is a multivalued map with nonempty closed bounded values and $g : C(I, X) \to X$ is continuous function.

First we discuss why the differential inclusions are important to be studied and give some preliminaries in its theory. Afterward evolution inclusions in Banach spaces are considered.

In case of local initial conditions we present the most important results about the structure of the solution set under different assumptions.

The last section contains the main existence results of the equation (1.1). We compare the advantages and disadvanages of the different approaches (with different assumptions).

Finally we discuss about the relaxation theorem in case A is linear and A is nonlinear. We give the exact closure of the solution set of (1.1), when the right-hand side is Lipschitz continuous.