Abstract

In this thesis we study a class of semilinear evolution inclusions of the form

$$\dot{y} \in A(t)y + F(t, y), \ y(t_0) = y_0 \in Y, \ t \in I = [t_0, T].$$

Let $A(\cdot)$ generate a compact evolution operator. In case the Banach space Y is not reflexive and F with not (weakly) compact values it is impossible in general to prove the existence of (mild) solution. We introduce a class of generalized solutions called here limit solutions. The advantage is that the limit solution exist under very mild assumptions on $F(\cdot, \cdot)$. We investigate the main properties of these solutions. Every mild solution is a limit solution. We show that the set of the limit solutions is nonempty compact R_δ set. When $F(\cdot, \cdot)$ is almost continuous with nonempty closed bounded values and $F(t, \cdot)$ satisfies the so called one-sided Perron condition we prove a variant of the well known Filippov–Pliss lemma and a relaxation theorem, i.e., the set of the mild solutions is dense in the set of limit solution.