

Abstract

In this thesis we study fully nonlinear evolution inclusions and also autonomous semilinear ones.

In the introduction we first give a review of the previous results existing in the literature. Afterward the basic definitions and notations used in the thesis are given.

The second chapter is devoted to nonlinear evolution inclusions given as multivalued perturbations of m -dissipative operators. We prove relaxation theorem in case of multivalued perturbations of m -dissipative evolution inclusions. First we prove that the solution set of (1.0.1) is dense in the solution set of (1.0.3) when the duality map $J(\cdot)$ is single valued. Afterward it is proved that the closure of the solution set of (1.0.1) is the set of limit solutions in arbitrary Banach spaces. Illustrative example is then provided.

In the last chapter we study semilinear system. As in the first chapter we show that the solution set of (1.0.3) is dense in the limit solution set. Afterward we prove that the set of limit solutions coincides with the set of weak solutions. Since the set of weak solutions of (1.0.3) and (1.0.4) coincides we are able to give short proof of the relaxation theorem. we also prove that the closure of the solution set of (1.0.3) is the limit solution set of (1.0.4). Finally we study the system (1.0.3) when the pseudoderivatives are continuous. We prove relaxation theorem also in that case. Illustrative examples are provided.