

A VIABILITY RESULT FOR EVOLUTION EQUATIONS ON LOCALLY CLOSED GRAPHS*

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Abstract

Using a tangency condition expressed with a set of integrals, we establish several necessary and sufficient conditions for viability referring to evolution equations on locally closed graphs.

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keywords: Differential inclusion, locally closed graph, tangent set, tangency condition, multi-valued mapping, viability.

1 Introduction

Let X be a real Banach space, let $I \subseteq \mathbb{R}$ be a nonempty and bounded interval and let $K : I \rightsquigarrow X$ and $F : \mathcal{K} \rightsquigarrow X$ be two multi-functions with nonempty values, where $\mathcal{K} := \text{graph}(K)$. Let $A : D(A) \subseteq X \rightarrow X$ be the infinitesimal generator of a C_0 -semigroup $\{S(t); t \geq 0\}$.

Our aim here is to prove some new necessary and sufficient conditions in order that \mathcal{K} be viable with respect to $A + F$. This paper is an extension of the results established by Necula-Popescu-Vrabie [7].

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