

Criteria for Controllability of Semilinear Measure-Driven Evolution Systems with Impulses and Nonlocal Inclusions

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Abstract

We establish definitive criteria for the complete controllability of semilinear, measure-driven evolution systems in Banach spaces that incorporate impulsive effects and nonlocal inclusions. Our method boldly combines the Hausdorff measure of noncompactness with a Mönch-type fixed point argument, effectively circumventing any compactness assumptions. The conditions we provide are explicit, easily verifiable, and directly applicable to partial differential equations (PDEs). An illustrative example of a PDE unequivocally demonstrates how our abstract theory translates into concrete inequalities. This work decisively presents the controllability result for measure-driven systems that include both impulsive effects and nonlocal inclusions, significantly extending and unifying the existing controllability theory within a groundbreaking framework.

References

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