

FRACTIONAL STOCHASTIC EVOLUTION HEMIVARIATIONAL INEQUALITIES AND OPTIMAL CONTROLS

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ABSTRACT. This paper investigates the existence of mild solutions for fractional stochastic evolution hemivariational inequalities and optimal controls. An existence theorem concerned with the mild solution for the presented system is proved by means of the fractional calculation, stochastic analysis theory, Bohnenblust–Karlin fixed point theorem and some properties of the Clarke subdifferential. Moreover, an existence result of optimal control pair that governed by a fractional stochastic evolution hemivariational inequality is also obtained. Finally, an example is given for demonstration.

1. Introduction

It is well known that the hemivariational inequality (HVI) was first introduced by Panagiotopoulos in 1981 as weak formulations for several classes of mechanical problems involving nonsmooth and nonconvex energy functionals (superpotentials) [34], [35]. Recently, many researchers have paid a lot of attentions on the control problems of HVIs. In 2000, Migórski and Ochal [30] discussed the optimal control problems of the parabolic HVIs via Galerkin method combined

2010 *Mathematics Subject Classification.* 34H05, 35R11, 60H15, 49J20, 93E20.

Key words and phrases. Fractional stochastic evolution inclusion; hemivariational inequality; Clarke subdifferential; mild solution; optimal control.

This work was supported by the National Natural Science Foundation of China (11671282), the Foundation of Guilin University of Technology (GUTQDJJ2017062), Guangxi Natural Science Foundation (2016GXNSFAA380082, 2018GXNSFAA281021).