



Viable solutions of lower semicontinuous quantum stochastic differential inclusions

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Received: 5 February 2019 / Accepted: 13 November 2020
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Abstract

We establish the existence and some properties of viable solutions of lower semicontinuous quantum stochastic differential inclusions within the framework of the Hudson–Parthasarathy formulations of quantum stochastic calculus. The main results here are accomplished by establishing a major auxiliary selection result. The results here extend the classical Nagumo viability theorems, valid on finite dimensional Euclidean spaces, to the present infinite dimensional locally convex space of non-commutative stochastic processes.

Keywords Lower semicontinuous · Nagumo viability · Tangent cone · Fock spaces

Mathematics Subject Classification 60H10 · 60H20 · 81S25

1 Introduction

This paper continues our previous works in [4–9, 12–16, 19, 20]. On this occasion, the existence and some properties of viable solutions of lower semicontinuous quantum stochastic differential inclusions (QSDI) are established. In our previous considerations, existence of solutions were sought and established globally in the locally convex space of solutions. In this work, the global requirement are removed by restricting the solution space to a subset of the entire space satisfying some topological conditions. By employing the multivalued analogue of quantum stochastic calculus developed by Hudson and Parthasarathy [17], in the framework of [13, 19] the main results of this paper are established.

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