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Stochastic inclusions driven by two-parameter martingales

The aim of this talk is to apply a concept of set-valued functional stochastic integral driven by two-parameter martingale to the theory of stochastic inclusions.

We will present a definition and some properties of the above mentioned integral. Then we shall present a form of the set-valued stochastic integral equation driven by two-parameter martingale, and the existence and uniqueness theorem of its solutions.

Next we will consider the following stochastic integral inclusion driven by two-parameter martingale

$$\begin{cases} \Delta_{s,t}^{s',t'}(x) \in \int_{[s,s'] \times [t,t']} F(u,v,x(u,v)) dA_{u,v} + \int_{[s,s'] \times [t,t']} G(u,v,x(u,v)) dM_{u,v} \\ x(0,t) = \xi(0,t) \\ x(s,0) = \xi(s,0) \end{cases} . \quad (1)$$

Finally, we shall present the main result of the talk, i.e. interrelation between solutions to stochastic integral inclusion (1) and set-valued stochastic integral equation driven by two-parameter martingale.

References

- [1] M. Michta, K.L. Świątek, Set-Valued Stochastic Integrals and Equations with Respect to Two-Parameter Martingales, *Stoch. Anal. Appl.* 33 (2015), 40–66.
- [2] M. Kozaryn, M. Michta, K.L. Świątek, Stochastic inclusions driven by two-parameter martingales, *Dynam. Systems Appl.* 25 (2016), 123-152.

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