Analysis Seminar

Path-regularity and martingale properties of set-valued stochastic integrals

By

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Abstract: This talk is about the path-regularity and martingale properties of set-valued stochastic integrals. Such integrals are fundamentally different from the well-known Aumann-Itô stochastic integrals and more suitable for representing set-valued martingales. However, like the Aumann-Itô integral, the new integral is only a set-valued submartingale in general, and there is very limited knowledge about its path-regularity. We first establish the existence of right- and left-continuous modifications of set-valued submartingales in continuous time and apply these results to set-valued stochastic integrals. We also show that a set-valued stochastic integral yields a martingale if and only if the set of terminal values of the stochastic integrals associated to the integrand is closed and decomposable. As a special case, we study the set-valued martingale in the form of the conditional expectation of a convex set-valued random variable. When this random variable is a convex random polytope, we show that the conditional expectation of a vertex stays as a vertex of the set-valued conditional expectation if and only if the random polytope has a deterministic normal fan.

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Place: Mathematics Seminar Room, SA – 141