

Connections between Causality and Measurable Separability of σ -algebras

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Abstract. The measurable separability of σ -algebras is defined in [?]. We will give a generalization of that definition for flows of information represented by filtrations. Some of the properties of measurable separability, that are directly connected to the concept of causality in continuous time [?, ?], will be considered. Also, we will show some connections between measurable separability of σ -algebras or filtrations and other known notions from the theory of stochastic processes [?].

We will apply the concept of causality on Bayesian experiment to prove its measurable separability. The main question in the theory of Bayesian experiment is: may the given Bayesian experiment be 'reduced' by marginalization or by conditioning and how far does such a reduction lose no 'relevant' information. This problem will be considered in view of the principle of conditioning.

Keywords: filtration; causality; measurable separability; Bayesian experiment.

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