

# Stochastic Processes in Riesz spaces

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Traditionally a stochastic process is defined in terms of measurable functions where the underlying measure space is a probability space, i.e. the measure of the whole space is 1. There is ample evidence the underlying order structure of the space of measurable functions plays a central role in the study of stochastic processes, a fact which was noted by, for example, Rao and de Jonge. Conditional expectations have been studied in an operator theoretic setting, by de Pagter, Dodds, Grobler, Huijsmans and Rao, as positive operators acting on  $\mathcal{L}^p$ -spaces and Banach function spaces.

The concepts of conditional expectations, martingales and stopping times are formulated on Riesz spaces. Various other aspects of stochastic processes will also be presented in the Riesz space setting. The approach presented is measure free, measure theory being used only to provide motivation for the definitions and theorems considered.

This talk is based on joint work with Coenraad Labuschagne and Bruce Watson.