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# Rare-Event Simulation in Insurance: Theory and Practice

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## Abstract

In this talk we first review some rare-event simulation tools and discuss their use and particular challenges in insurance applications. We then describe recent advances in insurance risk theory when suitably chosen approximations can be used as efficient control variates to reduce the variance of Monte Carlo estimates of survival probabilities. Finally, we illustrate the suitability of spatial dependence models based on max-stable processes and their simulation to study quantiles and pooling effects for flood risk in a case study for Austria.

**Keywords:** Insurance, rare, event simulation, extremes

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