



Research School for Operations  
Management and Logistics

**Stochastic processes driven by non-convex resource allocation problems**

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We analyse a family of stochastic processes of which the dynamics are driven by a class resource allocation problems related to non-convex optimisation problems. These processes naturally occur as multi-scale models that describe congestion in man-made systems such as energy and communication networks. Being Markov processes on infinite-dimensional state spaces, their analysis is mathematically challenging and current techniques insufficient: Linear approximations of the driving resource allocation problem can lead to a poor understanding of such systems and to suboptimal designs, especially under critical loading.