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*Efficient stochastic simulation of multiscale reaction-diffusion models*

Recently, computational and experimental tools for investigating biochemical reactions experienced a rapid development. Therefore a precise numerical analysis of modelling approaches on a micro- or mesoscopic scale is now possible. This has a huge potential of leading to new insights into key cellular processes such as intracellular signalling pathways or cell divisions on an unprecedented level of detail.

I present a new hybrid numerical method for stochastic discrete models of heterogeneous biochemical reaction networks, that combines exact and approximate simulation strategies. The idea is it to efficiently cope with a variety of event rates (diffusion and reaction) to reduce the significant computational cost of exact inhomogeneous stochastic simulation algorithms, given high event rates. This is joint work with Silvana Ilie and Katrin Rohlf.