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A hybrid method for stochastic simulations of reaction-diffusion epidemic models

Reactive Multiparticle Collision (RMPC) Dynamics, a particle-based method, is able to keep track of every single individual in a population. However, tracking of infectious individuals becomes infeasible as the cases increase, in which case a compartment-based method, such as Inhomogeneous Stochastic Simulation Algorithm (ISSA), is typically used. This motivated the development of a temporally coupled RMPC-ISSA framework. The hybrid method results in significant acceleration of the simulations of reaction-diffusion epidemic models compared to RMPC-only simulations. This is joint work with K. Rohlf.