

# Multiscale integration of Fokker-Planck equations

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In this talk, we consider a class of multiscale stochastic system for which the evolution of the probability density for the coarse variable can be described by a convection-diffusion equation, the so-called Fokker-Planck equation. We present a multiscale procedure that builds on the equation-free and heterogeneous multiscale framework to numerically integrate this equation. To this end, we estimate the unknown parameters (drift and diffusion) in the macroscopic description using only appropriately chosen realizations of the full multiscale system. The solution of the Fokker-Planck equation is then computed via standard numerical methods. We also present stability and error bounds on the result as a function of the quality of the estimation.