

1 MATLAB function files

1.1 Description of the Function Inputs

The list below describes the inputs required by the MATLAB functions. The functions, which require each input are given in parenthesis after the description.

- ngrid** the number of grid points (avg_deff.m, flash_deff, flash_int)
- lp** the length of one period of the potential (avg_deff.m, flash_deff, flash_int)
- D** the diffusion coefficient of the particle (avg_deff.m, flash_deff, flash_int, samp_paths.m)
- kT** the Boltzmann constant times the absolute temperature (avg_deff.m, flash_deff, flash_int, samp_paths.m)
- tfinal** the final time (flash_int, samp_paths.m)
- p** a $2 \times$ ngrid dimensional vector containing the initial probabilities for the flashing ratchet problem. The first ngrid values correspond to S_1 and the second to S_2 . The vector p must sum to one. (flash_int)
- dt** the time step. (flash_int)
- xinit** the initial position of the particle (samp_paths.m)
- sinit** the initial chemical state (samp_paths.m)
- dx** the space step (samp_paths.m)
- nsamp** the number of samples to record. The interval between samples is tfinal/nsamp. (samp_paths.m)
- ppot1** a vector containing the parameters needed by the function pot1. (avg_deff.m, flash_deff, flash_int, samp_paths.m)
- ppot2** a vector containing the parameters needed by the function pot2. (flash_deff, flash_int, samp_paths.m)
- pk12** a vector containing the parameters needed by the function fk12 (flash_deff, flash_int, samp_paths.m)

pk21 a vector containing the parameters needed by the function fk21. (flash_deff, flash_int, samp_paths.m)

pot1(x,ppot1) a user supplied function that evaluates the first potential at position x using the parameters in the vector ppot1. (avg_deff.m, flash_deff, flash_int, samp_paths.m)

pot2(x,ppot2) a user supplied function that evaluates the second potential at position x using the parameters in the vector ppot2. (flash_deff, flash_int, samp_paths.m)

fk12(x,pk12) a user supplied function that evaluates the rate k_{12} at position x using the parameters in the vector pk12 (flash_deff, flash_int, samp_paths.m)

fk21(x,pk21) a user supplied function that evaluates the rate k_{21} at position x using the parameters in the vector pk21 (flash_deff, flash_int, samp_paths.m)

1.2 MATLAB Function Files

avg_deff (ngrid, lp, D, kT, ppot1, pot1)

flash_deff (ngrid, lp, D, kT, ppot1, ppot2, pk12, pk21, pot1, pot2, fk12, fk21)

flash_int (p,ngrid, lp, D, kT, tfinal, dt, ppot1, ppot2, pk12, pk21, pot1, pot2, fk12, fk21)

samp_paths (xin,sin, tfinal, nsamp, dx, D, kT, ppot1, ppot2, pk12, pk21, pot1, pot2, fk12, fk21)