

KINETIC EQUATION FOR NON-MARKOVIAN
GAUSSIAN PROCESSES IN LINEAR
MULTIDIMENSIONAL SYSTEMS

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S u m m a r y

We develop a consistent operator formalism for the derivation of a generalized Fokker–Planck equation (GFPE) for linear multidimensional stochastic systems driven by coloured Gaussian noise. We study the relaxation in the phase space to the Maxwellian distribution for two types of correlation functions (CFs) of the external Gaussian noise, namely for the exponential and power-law CFs, and have found that, with the proper normalization, the latter relaxation process is slower than that for the exponential CF with short (in comparison with the inverse friction constant) correlation time, but faster than for the exponential CF with long correlation time. We study also in detail the next stage of relaxation, that is the diffusion in a real space. Here, we pay a special attention to the phenomenon of superdiffusion driven by a power-law CF on the infinite axis and the superdiffusion with adsorption on the semiaxis.