Significance of the Noise-induced Drift

particle distribution function

– – – – profile of $D(x)$

no noise-induced drift
$P(x)$ is not constant

with noise-induced drift

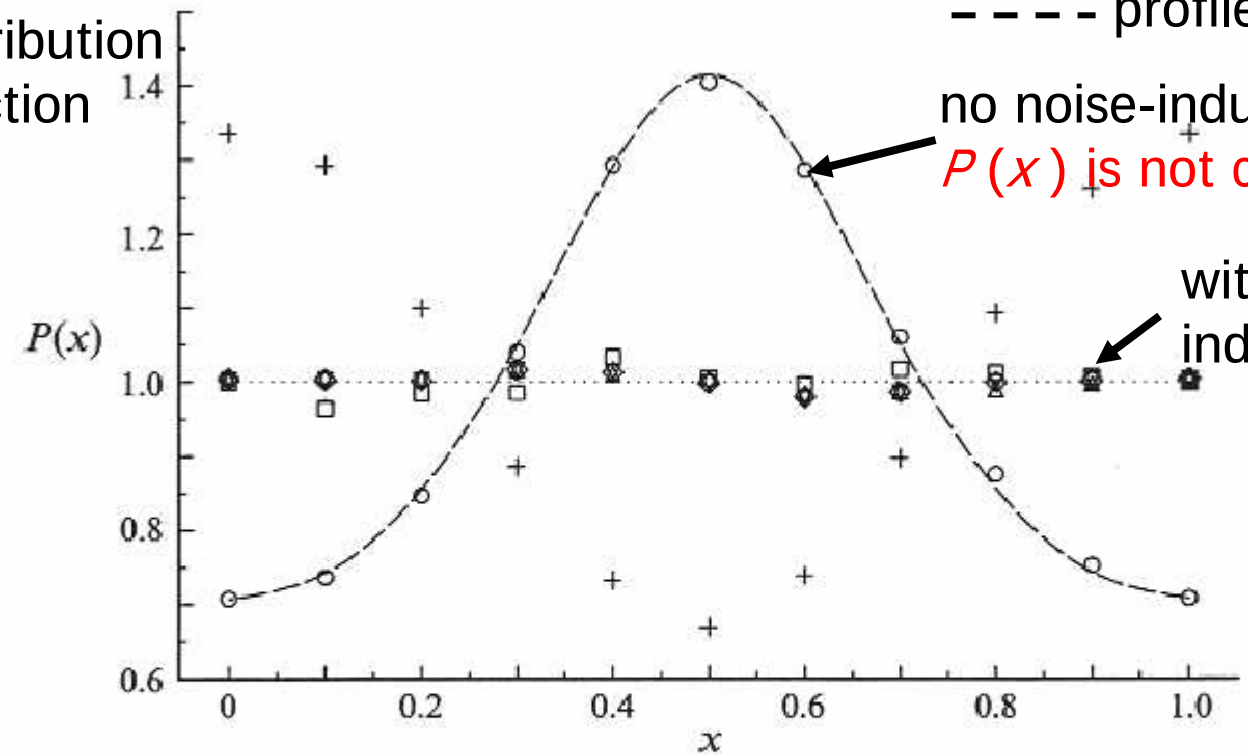

FIGURE 5. Variable diffusivity. The probability distributions from various algorithms for a particle diffusing on [0, 1] with variable diffusivity $D(x) = \frac{1}{2} + \frac{1}{2}\cos^2 \pi x$. All the simulations have a time-step of $\delta t = 6.67 \times 10^{-5}$ and average over a time 10^3. The simple diffusion algorithm of §2.1 (○). The dashed curve is the distribution $\propto 1/D(x)$. The Langevin algorithm with $m = 0.05$ (□). The Ermak & McCammon algorithm (△). The mid-point algorithm (▽). The mid-point algorithm plus the Ermak & McCammon $\nabla \cdot \boldsymbol{D}$ term (+). The two-step algorithm of §3.5 (◇).

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