A Simulated stochastic state-transition dynamics

$$dX_t = -\nabla U dt + \sqrt{2\beta^{-1}} dB_t$$

B Evolution of probability density

$$\frac{\partial}{\partial t} p(x_2, t) = -\frac{\partial}{\partial x_2}\left[U(x_2) p(x_2, t)\right] + \beta^{-1} \frac{\partial^2}{\partial x_2^2} p(x_2, t)$$