- Monte Carlo estimation of the likelihood (section 3.2), given M number of trajectories of the probabilistic method. Then

$$\int \mathcal{L}\left(d, U^{h,\sigma}(\theta,\xi)\right) \mathrm{d}\xi = \frac{1}{M}\sum_{i=1}^{M} \mathcal{L}\left(d, U_i^{h,\sigma}(\theta,\xi_i)\right),$$

  where the index i indicates the draws from the solution $U^{h,\sigma}$. Is it necessary to perform a Monte Carlo estimation of the likelihood at each MCMC iteration?