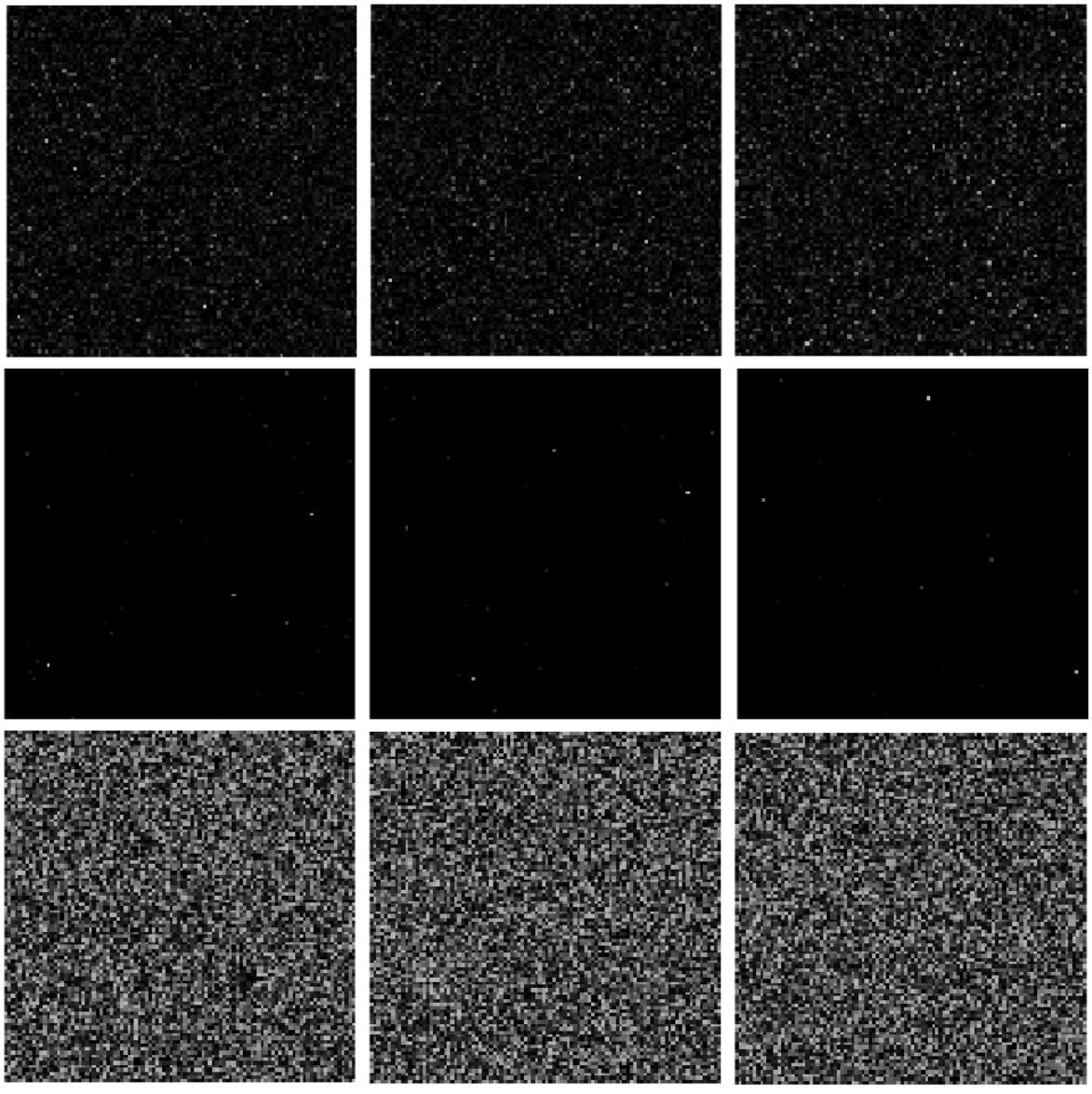
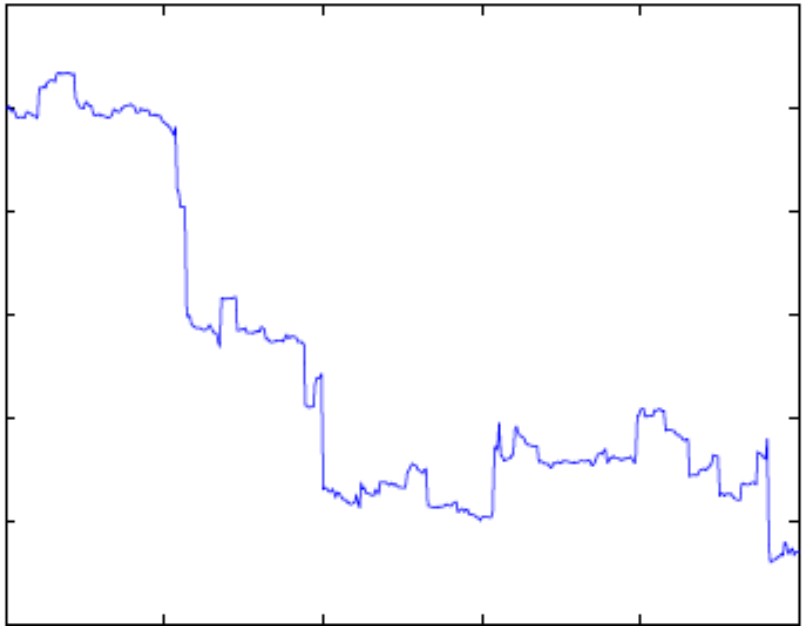
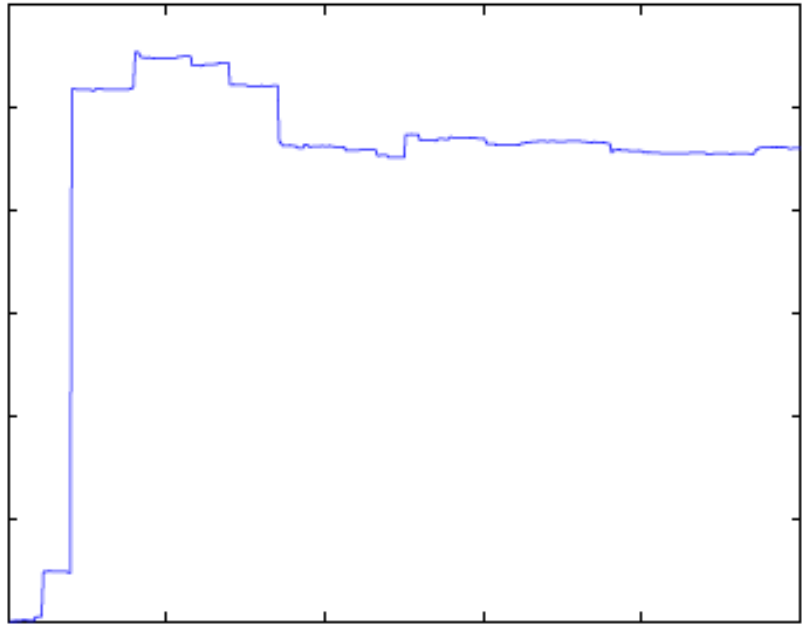
Prior models

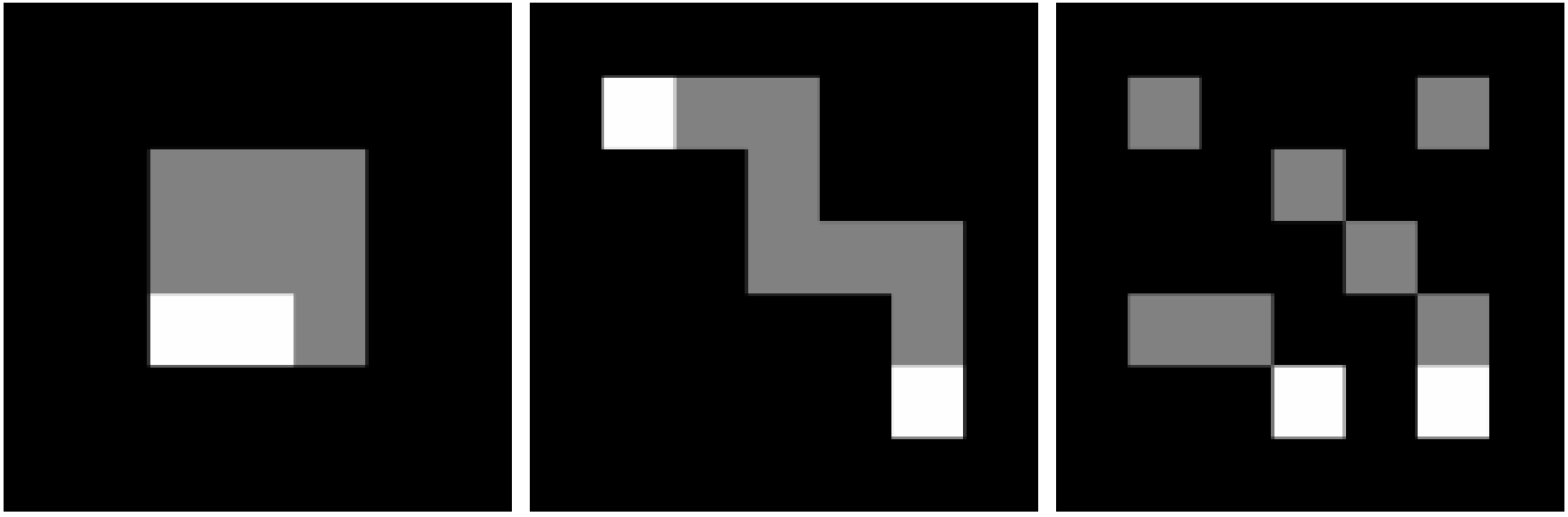


Random draws from ℓ^1 prior, Cauchy prior and white noise prior.
All priors include positivity constraint and we have chosen $\alpha = 1$.

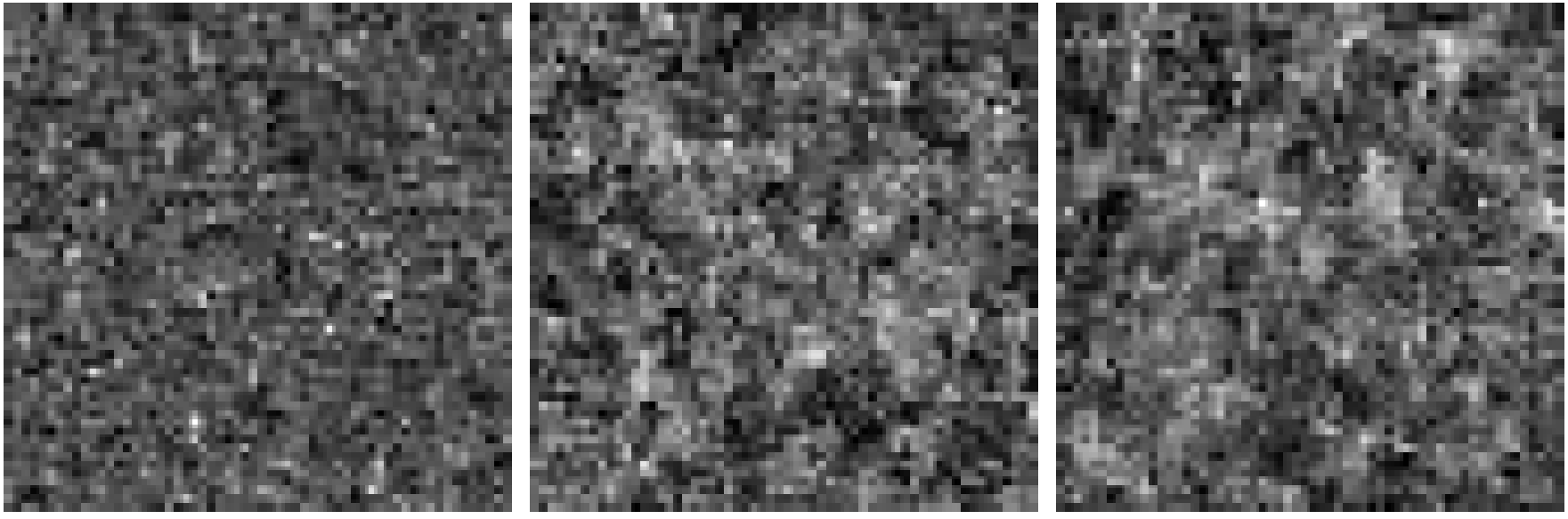




Two random draws from the 'jump prior'. The parameter $\alpha = 1$.

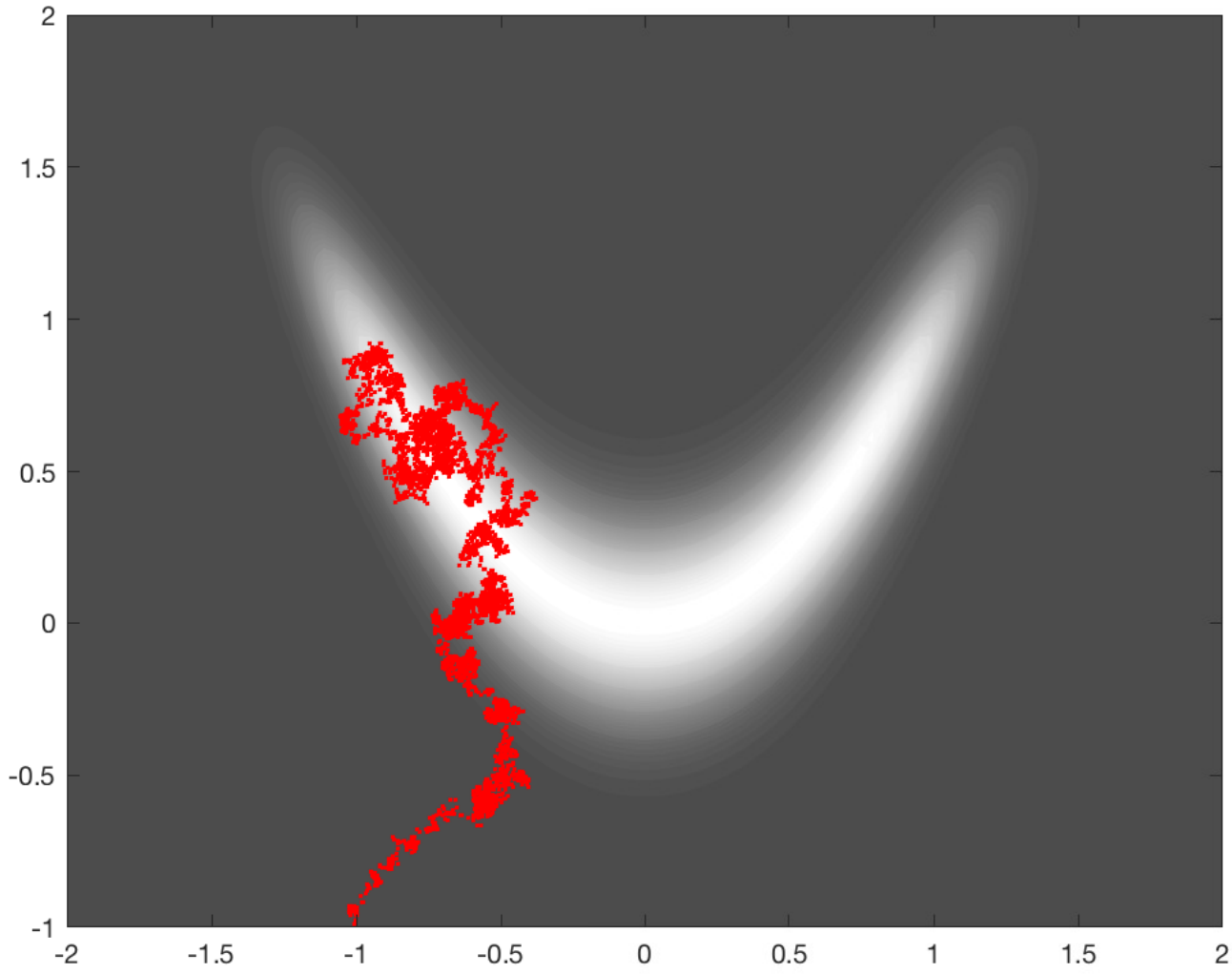


Three 7×7 pixel images with equal energy but different total variation (18, 28 and 40 from left to right).

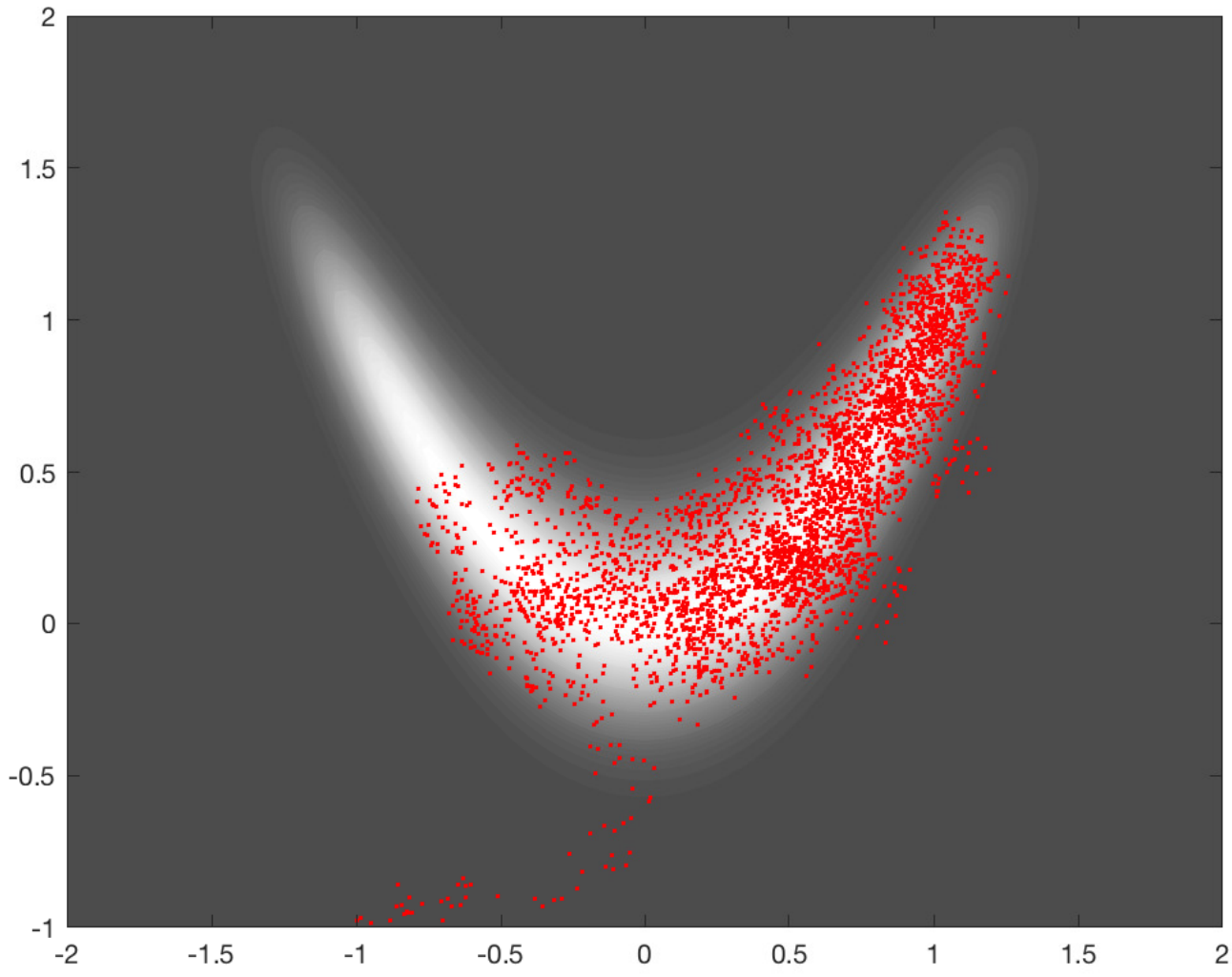


Three draws from total variation prior with positivity constraint.

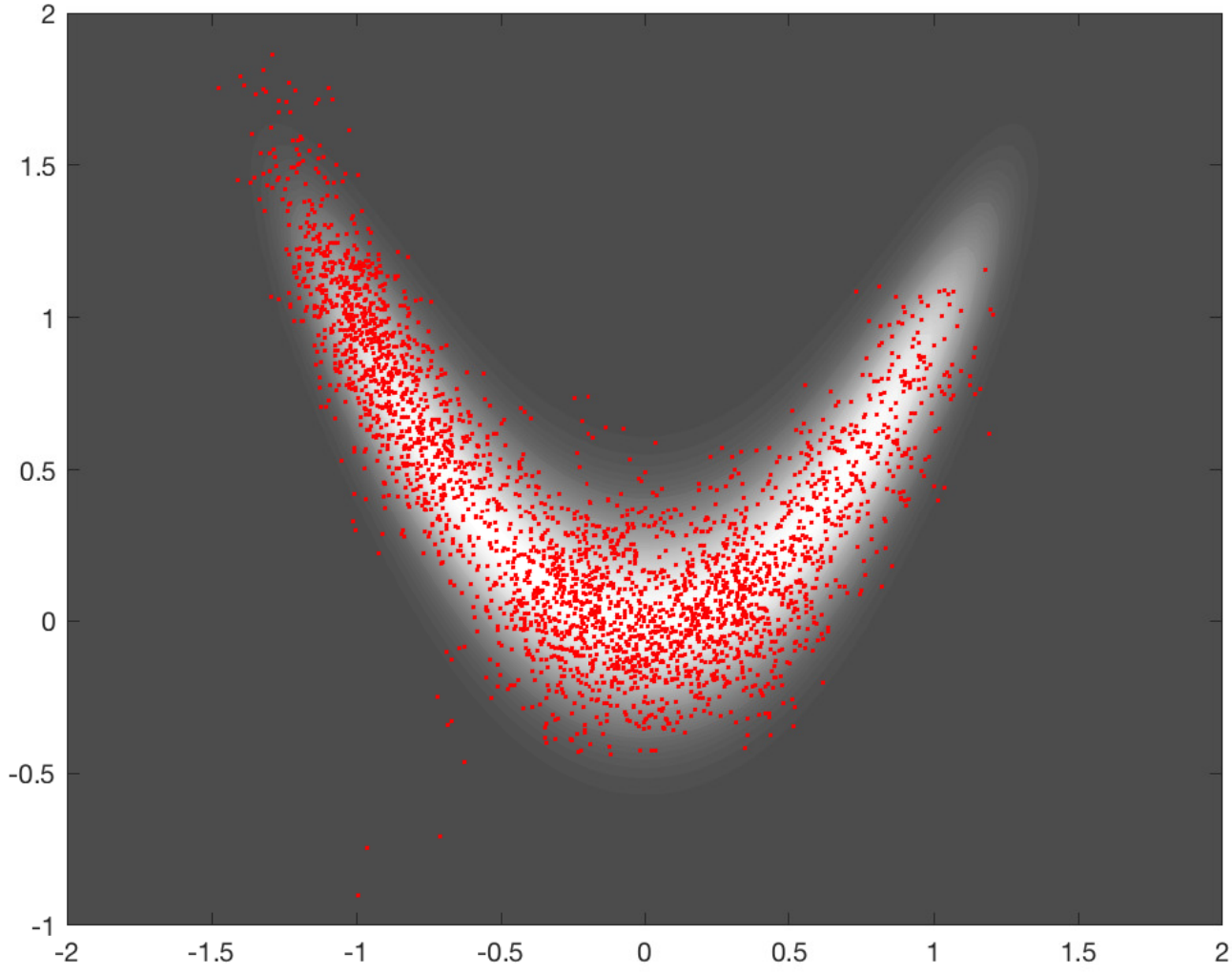
Sampling methods



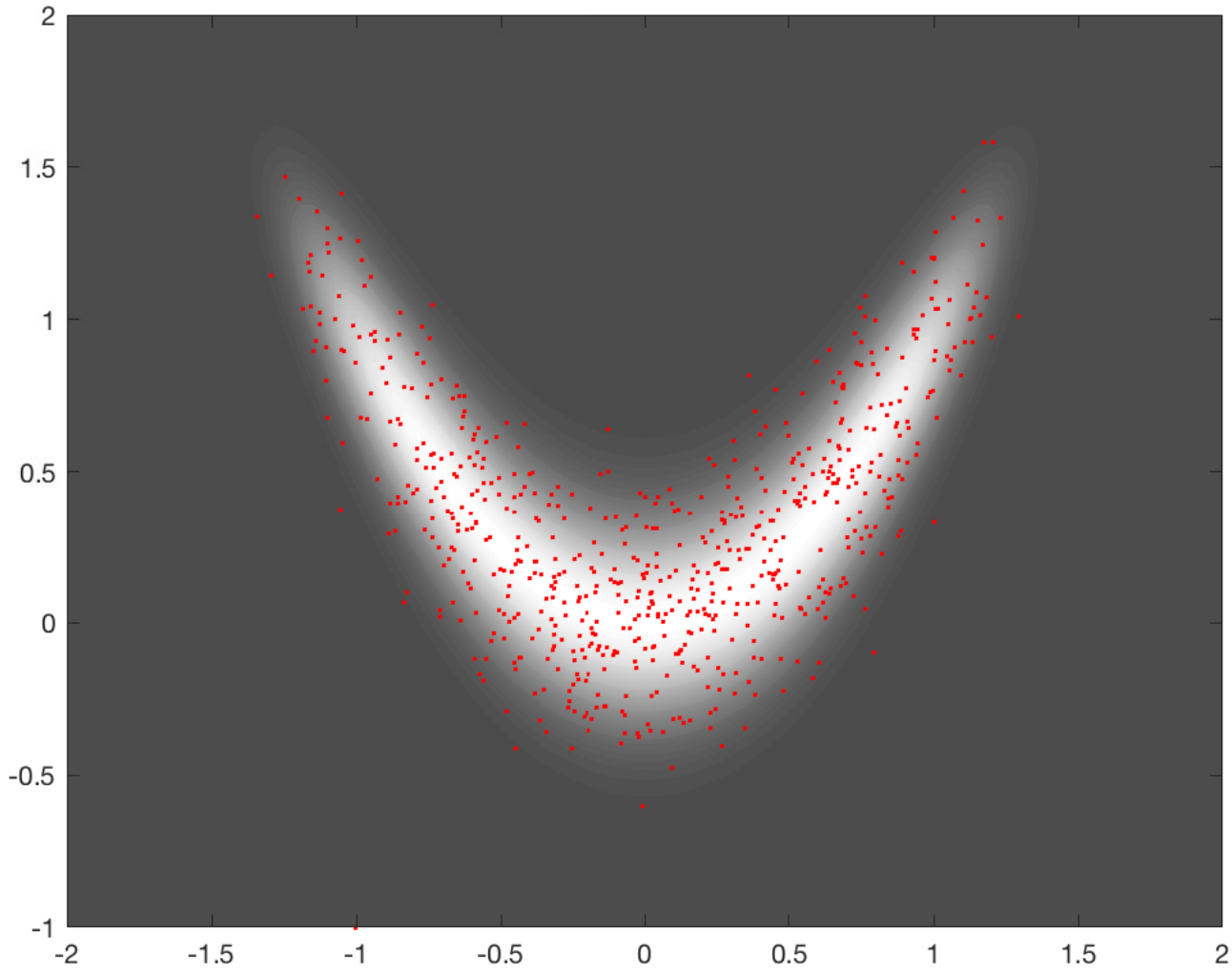
Outcome of the random walk Metropolis–Hastings run with step size $\gamma = 0.01$. The proportion of accepted proposals is 0.95, that is, almost all of the proposed moves are accepted.



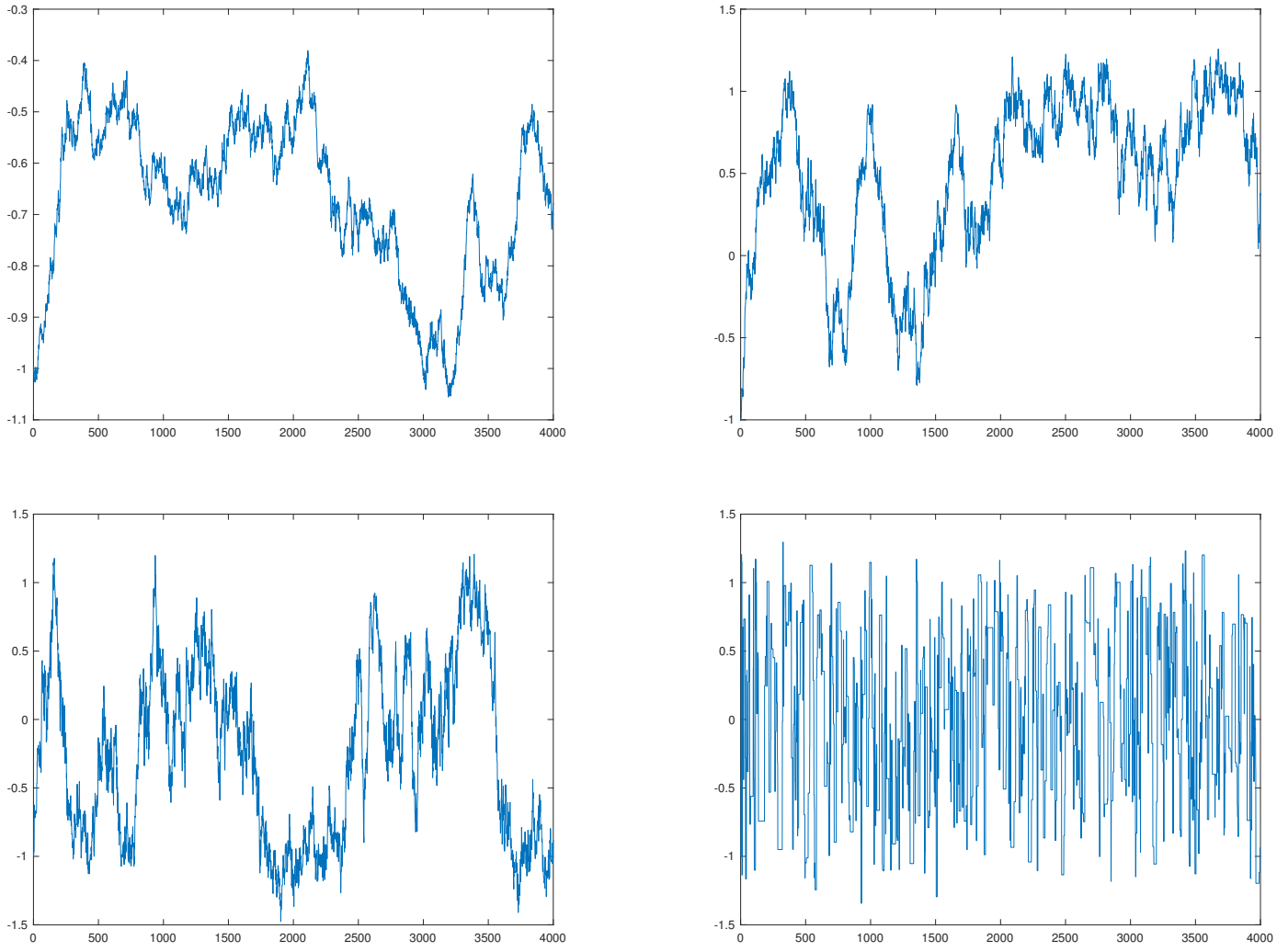
Outcome of the random walk Metropolis–Hastings run with step size $\gamma = 0.05$. The proportion of accepted proposals is 0.89.



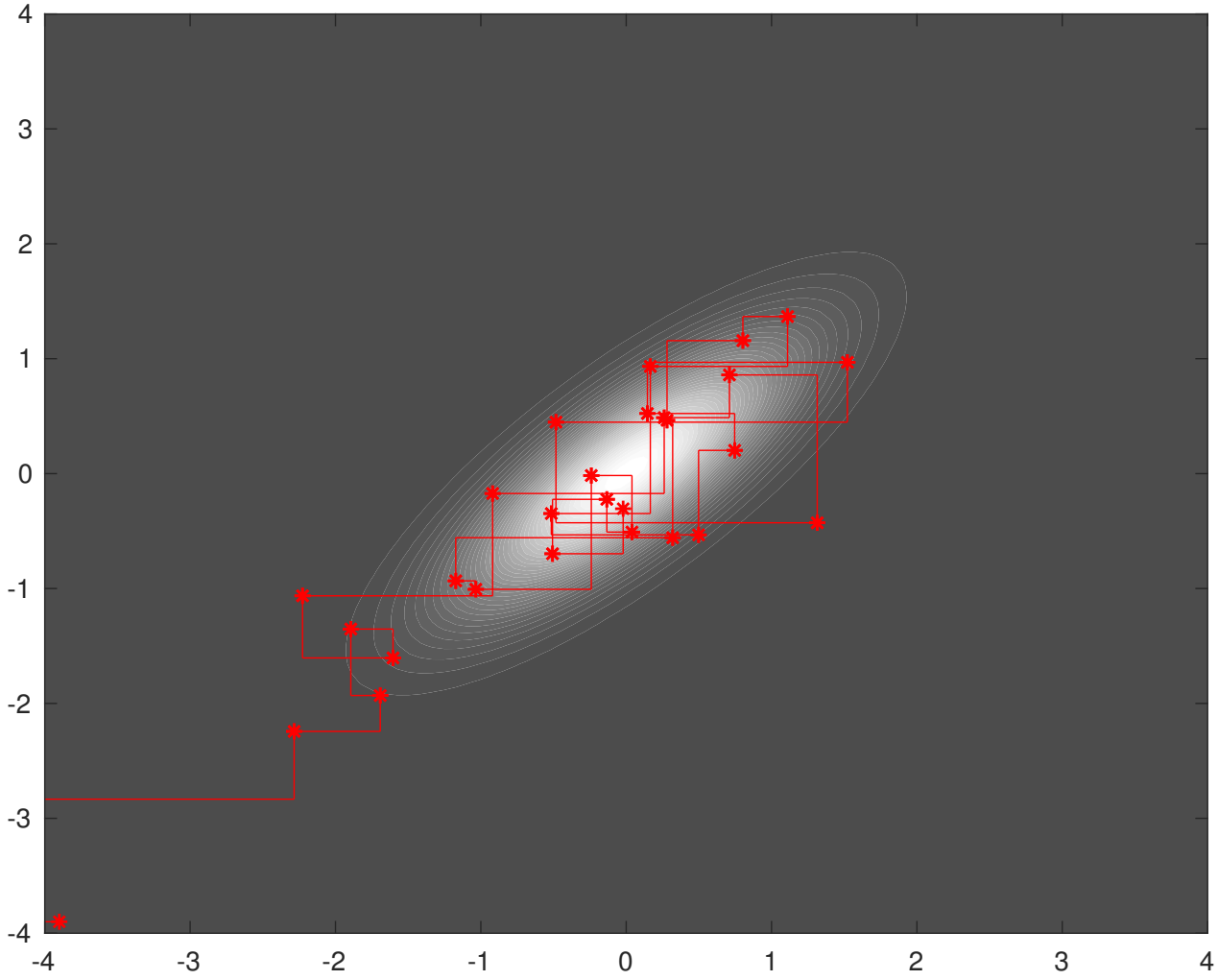
Outcome of the random walk Metropolis–Hastings run with step size $\gamma = 0.1$. The proportion of accepted proposals is 0.78.



Outcome of the random walk Metropolis–Hastings run with step size $\gamma = 1$. The proportion of accepted proposals is 0.17, that is, most of the proposed moves are rejected.

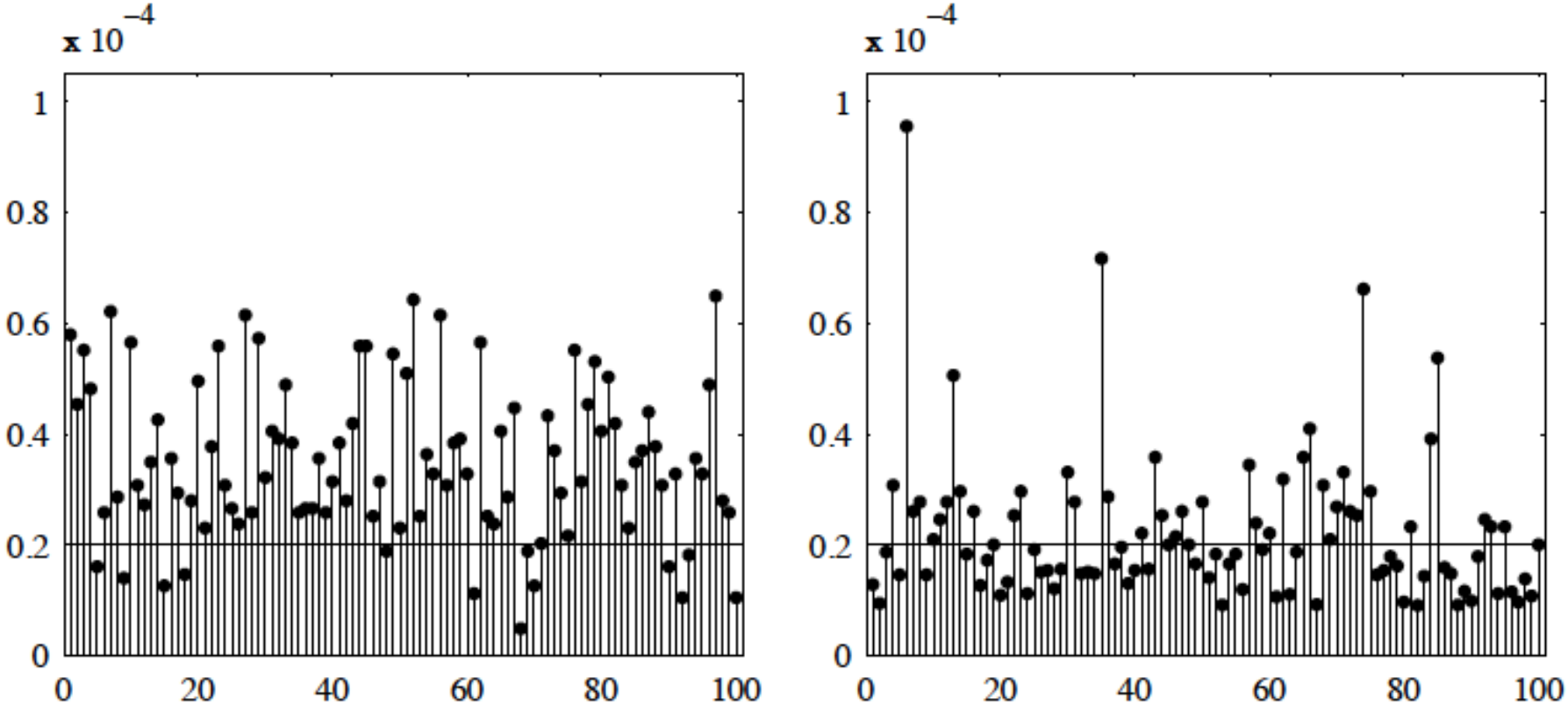


Draws for x_1 with a) $\gamma = 0.01$, b) $\gamma = 0.05$, c) $\gamma = 0.1$ and d) $\gamma = 1$. In a)-c) the correlation length is quite significant.

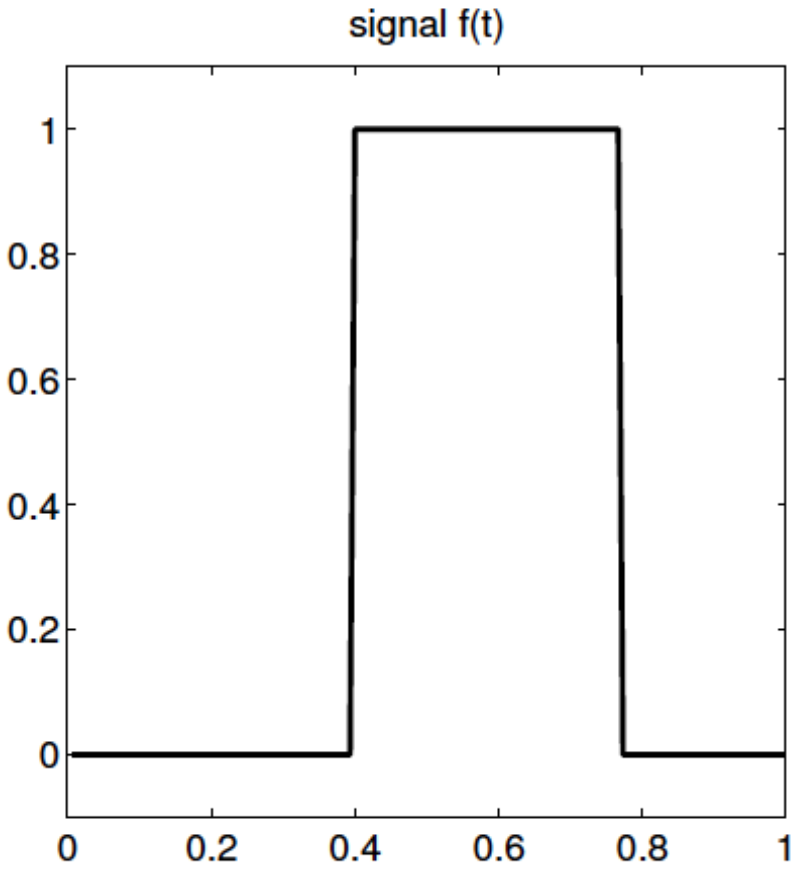


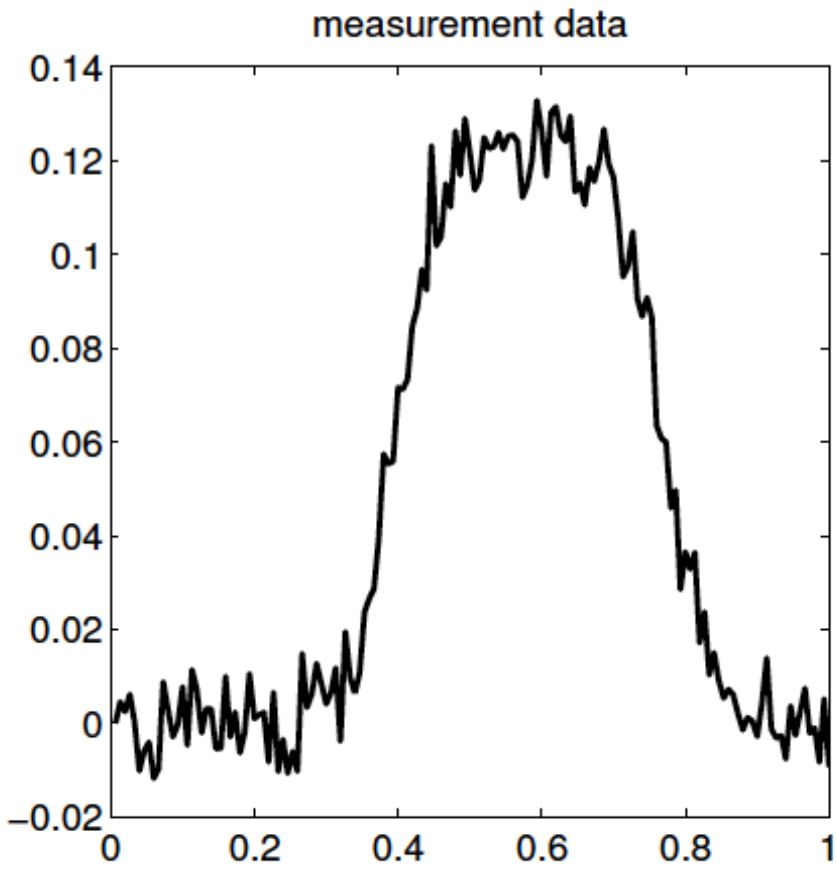
The first 30 draws produced by the Gibbs sampler. The samples are marked by a star, and the componentwise updating paths from sample to sample are drawn.

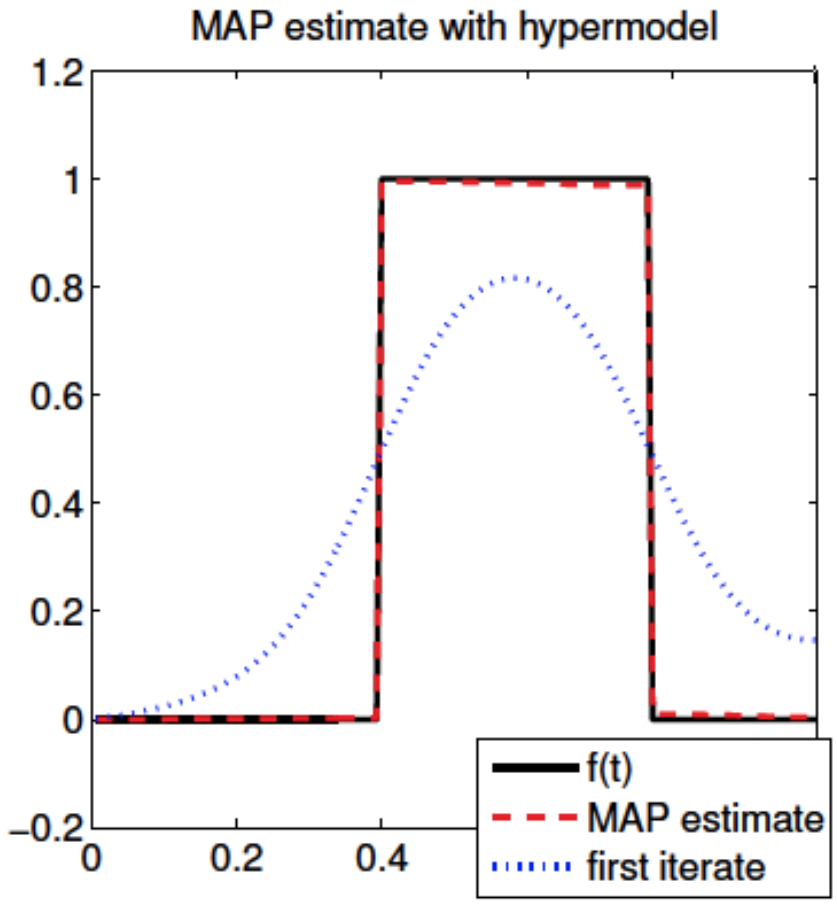
Hierarchical models

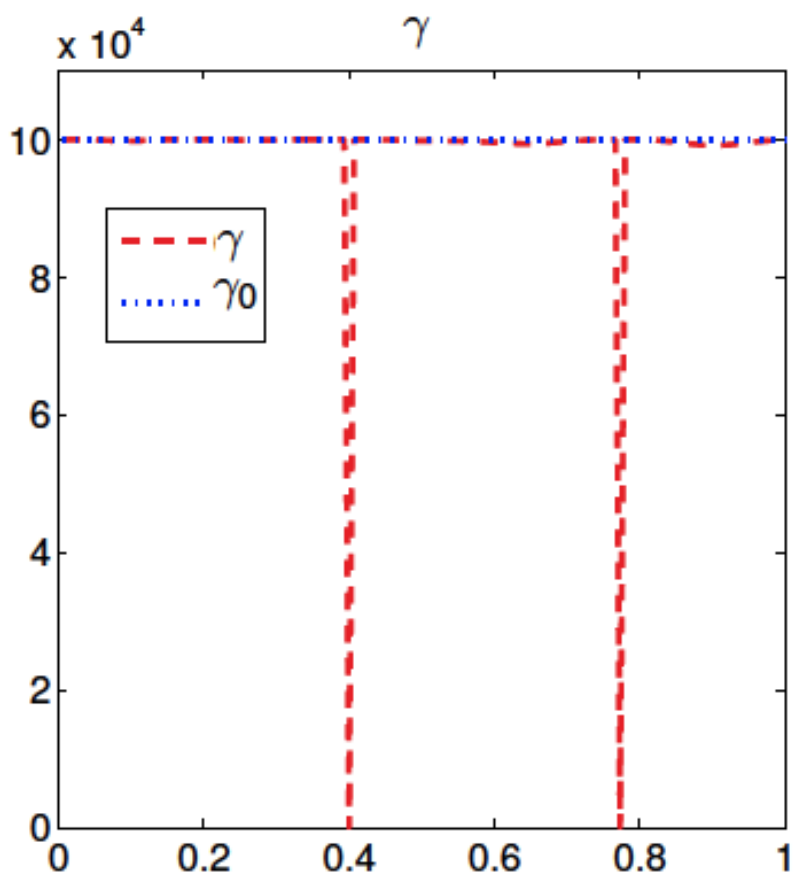


Draws from Gamma distribution (left) and inverse Gamma distribution (right).


signal f(t)
1
0.8
0.6
0.4
0.2
0
0
0.2
0.4
0.6
0.8
1


measurement data
0.14
0.12
0.1
0.08
0.06
0.04
0.02
0
−0.02
0
0.2
0.4
0.6
0.8
1





MAP estimators for the signal *f* and hyperparameter γ.