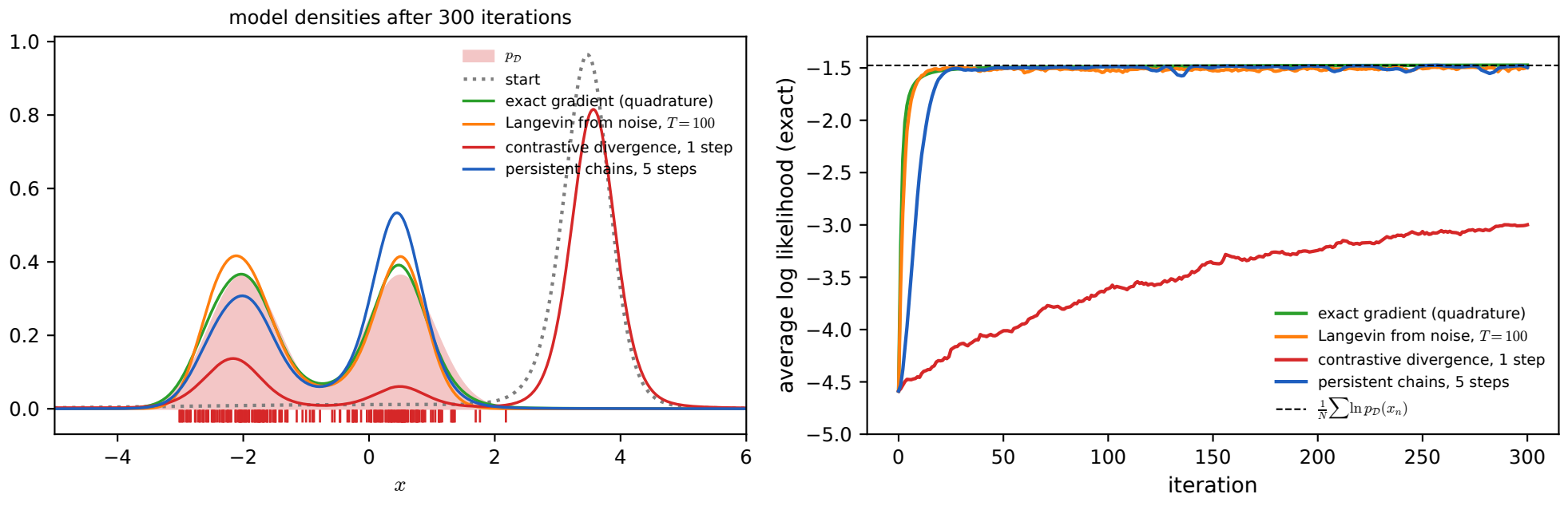

model densities after 300 iterations
$p_{\mathcal{D}}$
start
exact gradient (quadrature)
Langevin from noise, $T=100$
contrastive divergence, 1 step
persistent chains, 5 steps
1.0
0.8
0.6
0.4
0.2
0.0
−4
−2
0
2
4
6
x
average log likelihood (exact)
−1.5
−2.0
−2.5
−3.0
−3.5
−4.0
−4.5
−5.0
0
50
100
150
200
250
300
iteration
exact gradient (quadrature)
Langevin from noise, $T=100$
contrastive divergence, 1 step
persistent chains, 5 steps
$\frac{1}{N}\sum \ln p_{\mathcal{D}}(x_n)$