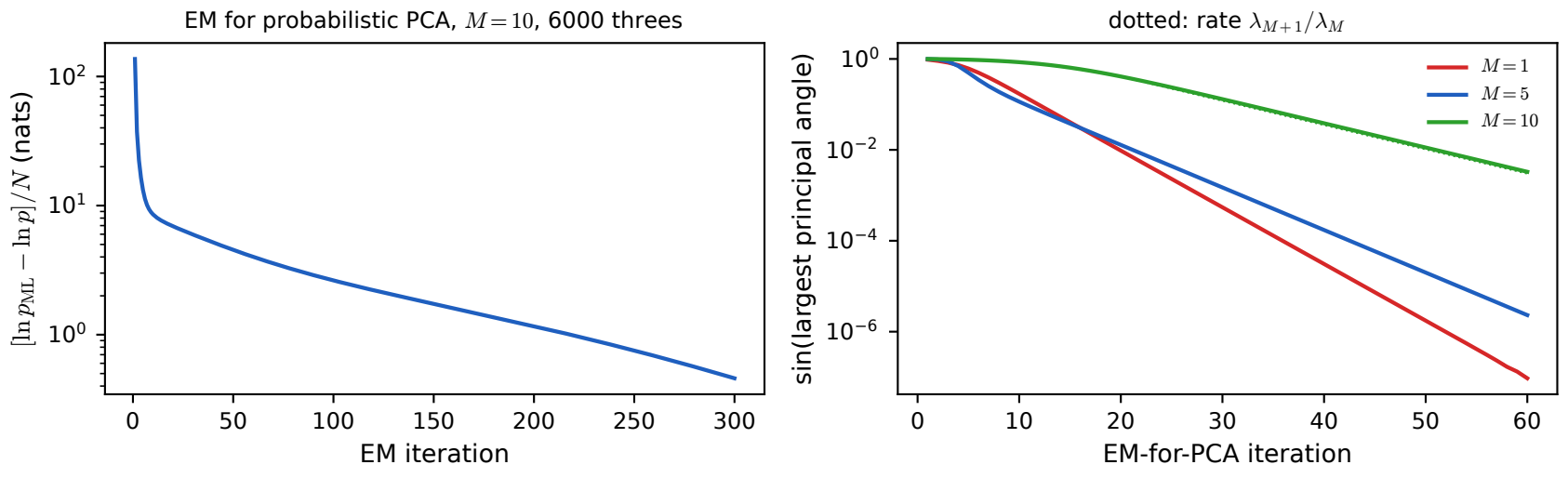

EM for probabilistic PCA, $M = 10$, 6000 threes
$[\ln p_{\mathrm{ML}} - \ln p]/N$ (nats)
10^2
10^1
10^0
0
50
100
150
200
250
300
EM iteration
dotted: rate λ_{M+1}/λ_M
sin(largest principal angle)
10^0
10^{-2}
10^{-4}
10^{-6}
$M = 1$
$M = 5$
$M = 10$
0
10
20
30
40
50
60
EM-for-PCA iteration