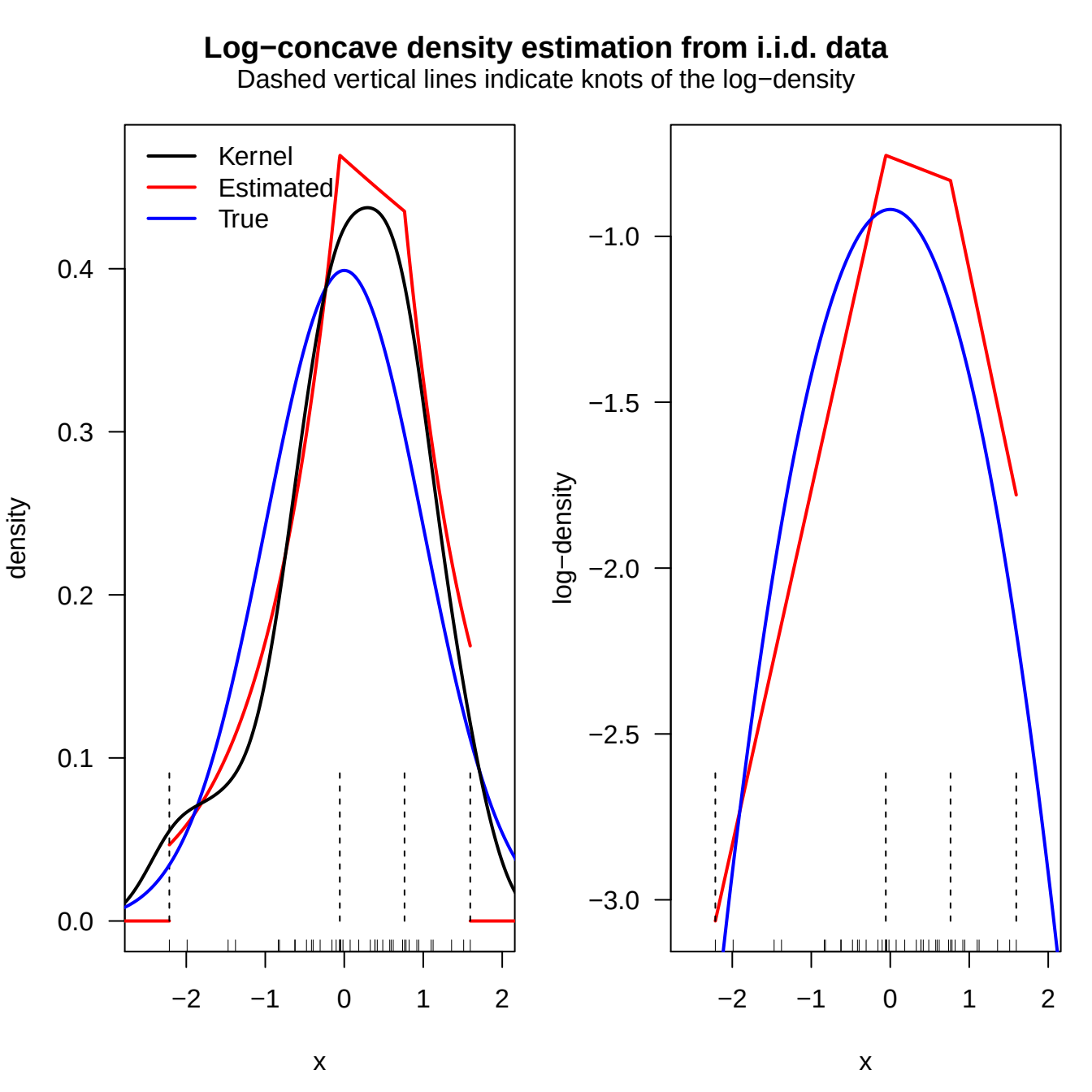
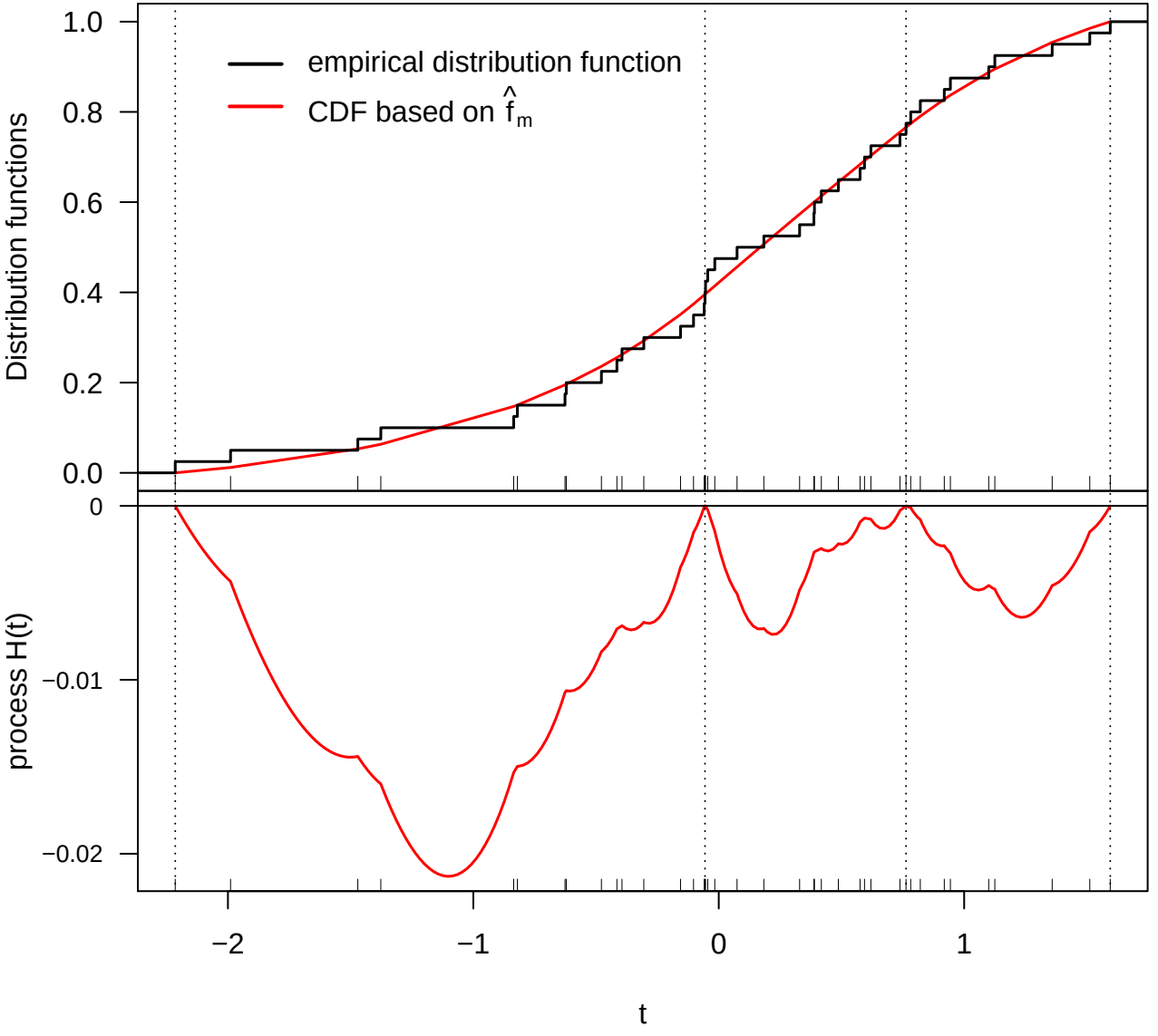
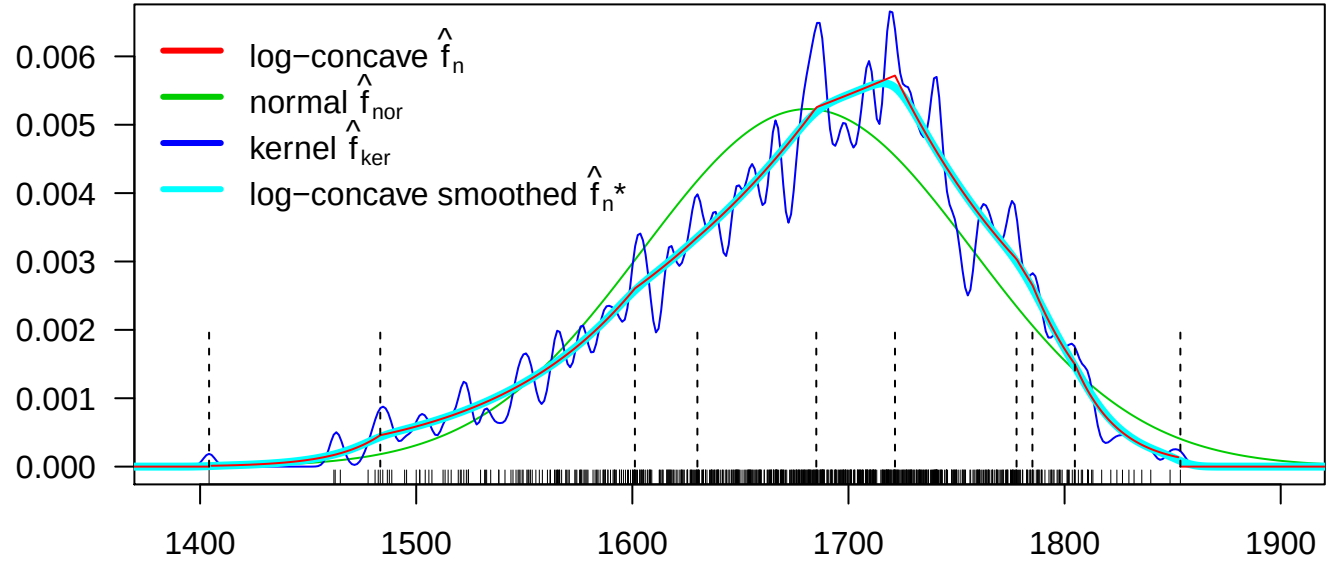
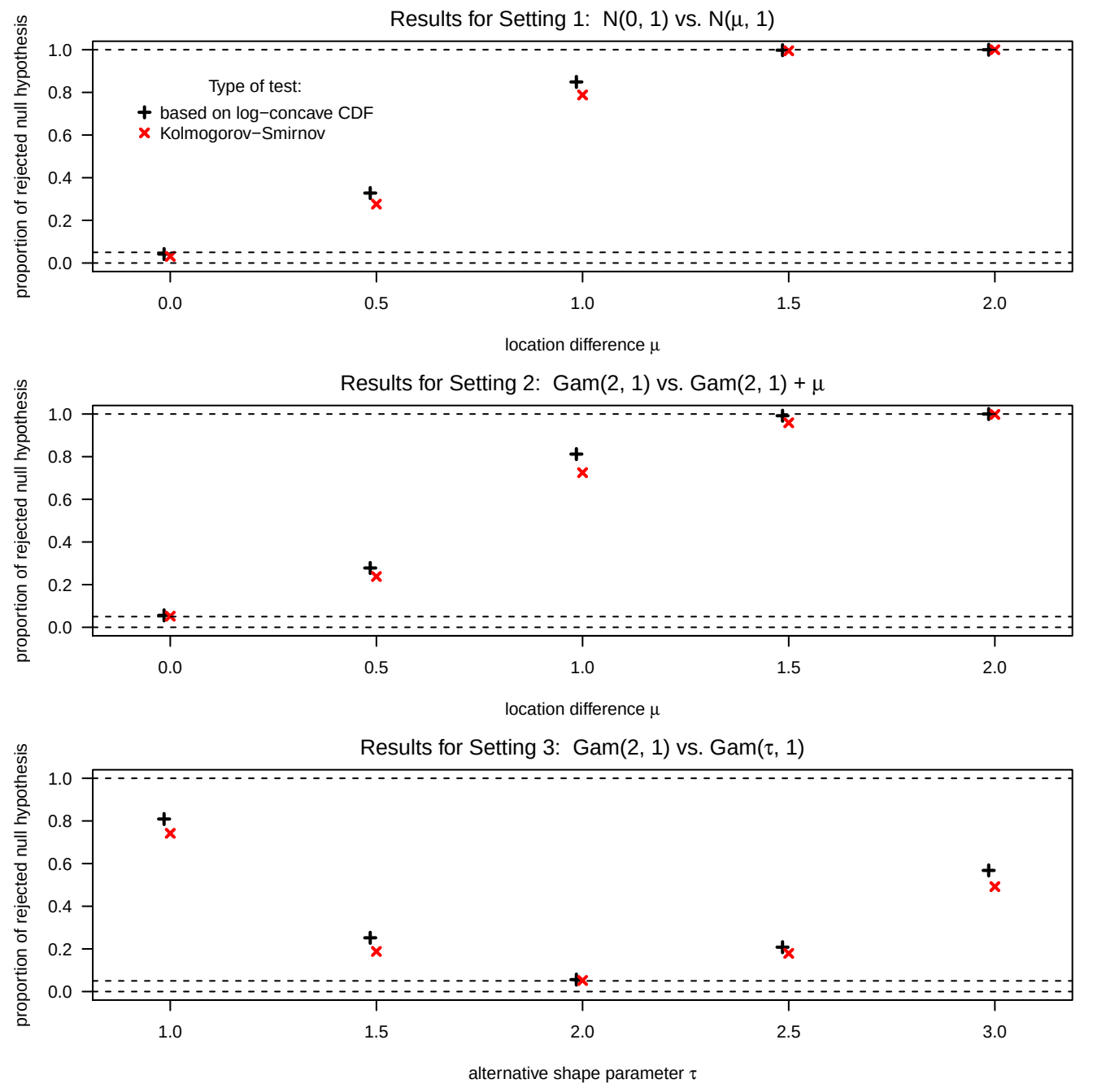
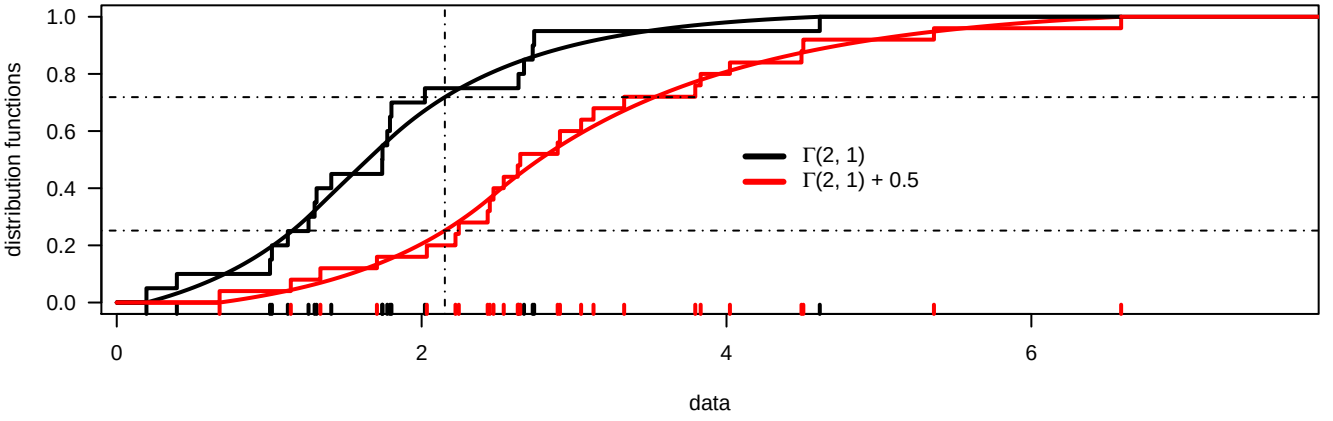

Log−concave density estimation from i.i.d. data
Dashed vertical lines indicate knots of the log−density
Kernel
Estimated
True
density
0.0
0.1
0.2
0.3
0.4
−2
−1
0
1
2
x
log−density
−1.0
−1.5
−2.0
−2.5
−3.0
−2
−1
0
1
2
x


empirical distribution function
CDF based on $\hat{f}_m$
Distribution functions
1.0
0.8
0.6
0.4
0.2
0.0
process H(t)
0
−0.01
−0.02
−2
−1
0
1
t


log−concave $\hat{f}_n$
normal $\hat{f}_{nor}$
kernel $\hat{f}_{ker}$
log−concave smoothed $\hat{f}_n$*
0.006
0.005
0.004
0.003
0.002
0.001
0.000
1400
1500
1600
1700
1800
1900


Results for Setting 1: N(0, 1) vs. N(μ, 1)
proportion of rejected null hypothesis
1.0
0.8
0.6
0.4
0.2
0.0
Type of test:
based on log−concave CDF
Kolmogorov−Smirnov
0.0
0.5
1.0
1.5
2.0
location difference μ
Results for Setting 2: Gam(2, 1) vs. Gam(2, 1) + μ
proportion of rejected null hypothesis
1.0
0.8
0.6
0.4
0.2
0.0
0.0
0.5
1.0
1.5
2.0
location difference μ
Results for Setting 3: Gam(2, 1) vs. Gam(τ, 1)
proportion of rejected null hypothesis
1.0
0.8
0.6
0.4
0.2
0.0
1.0
1.5
2.0
2.5
3.0
alternative shape parameter τ


distribution functions
1.0
0.8
0.6
0.4
0.2
0.0
0
2
4
6
data
Γ(2, 1)
Γ(2, 1) + 0.5