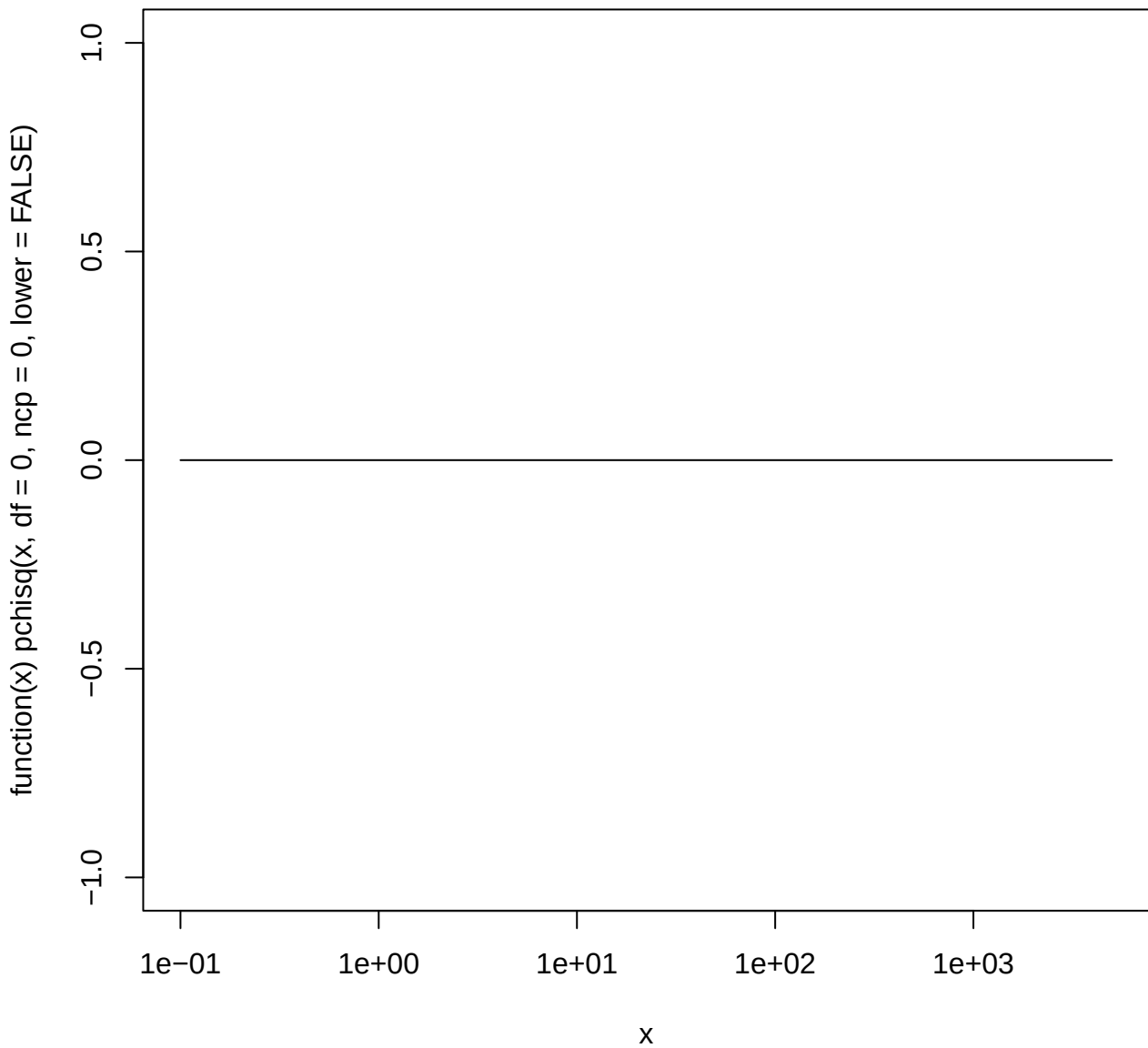
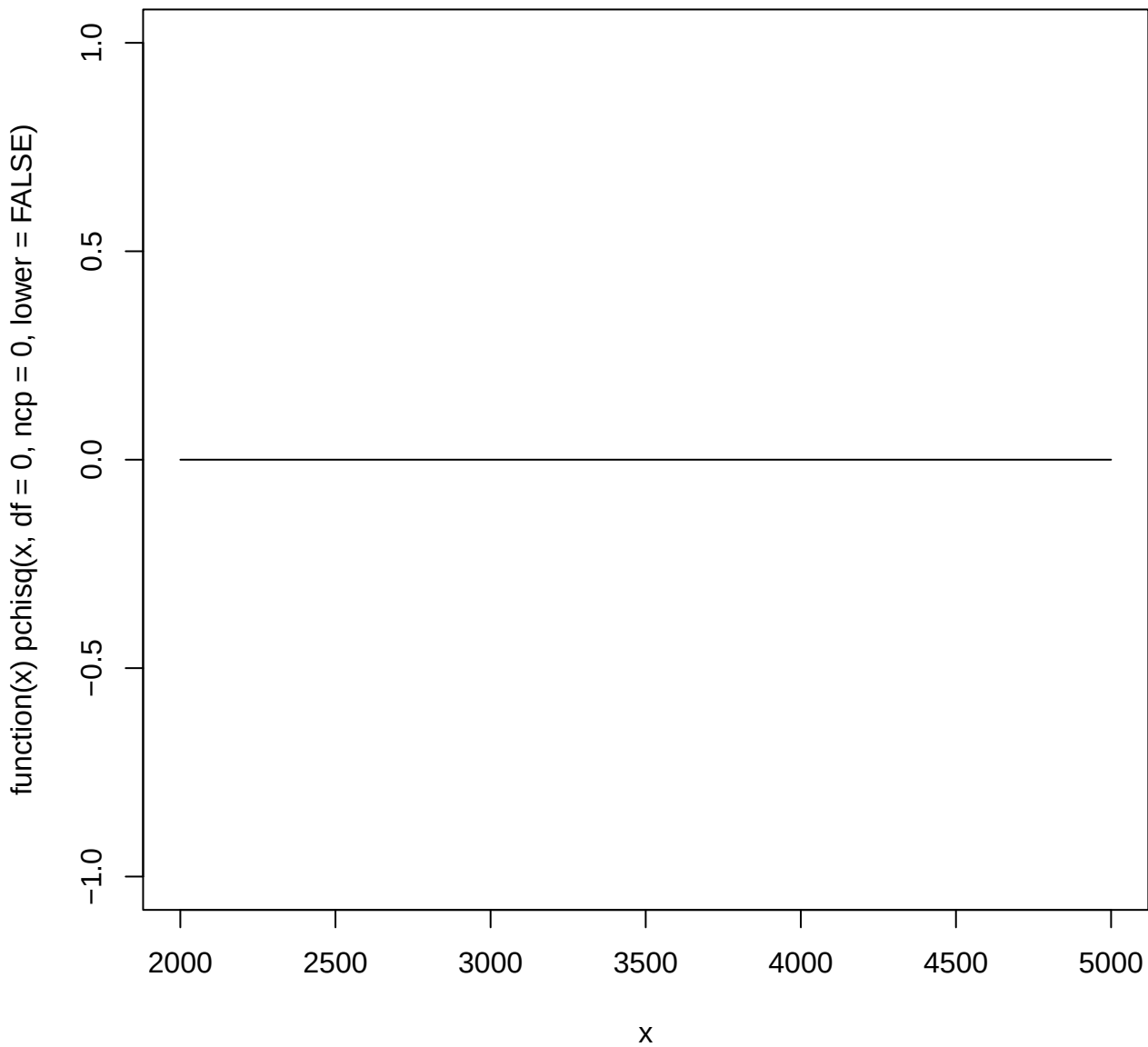
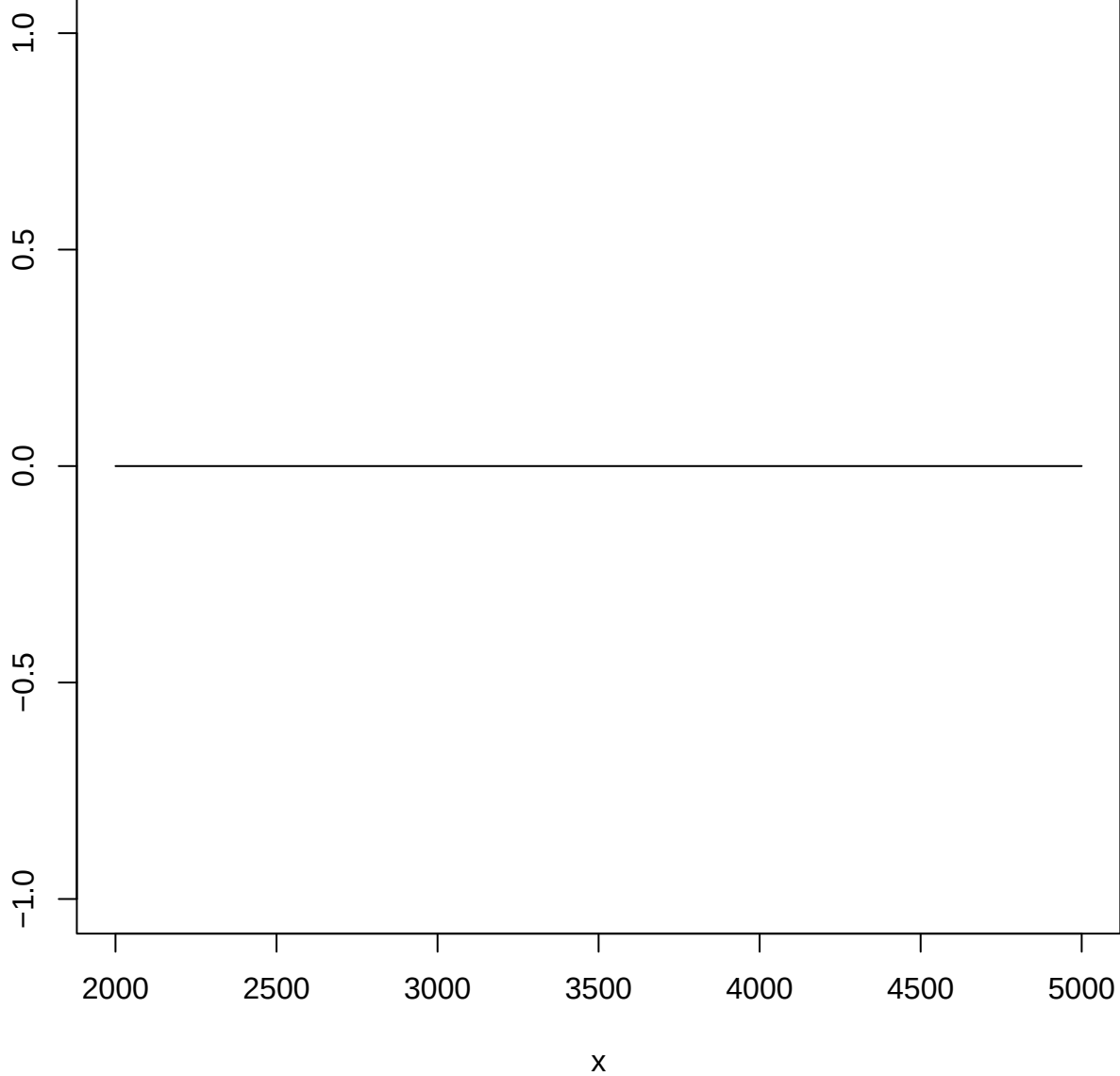


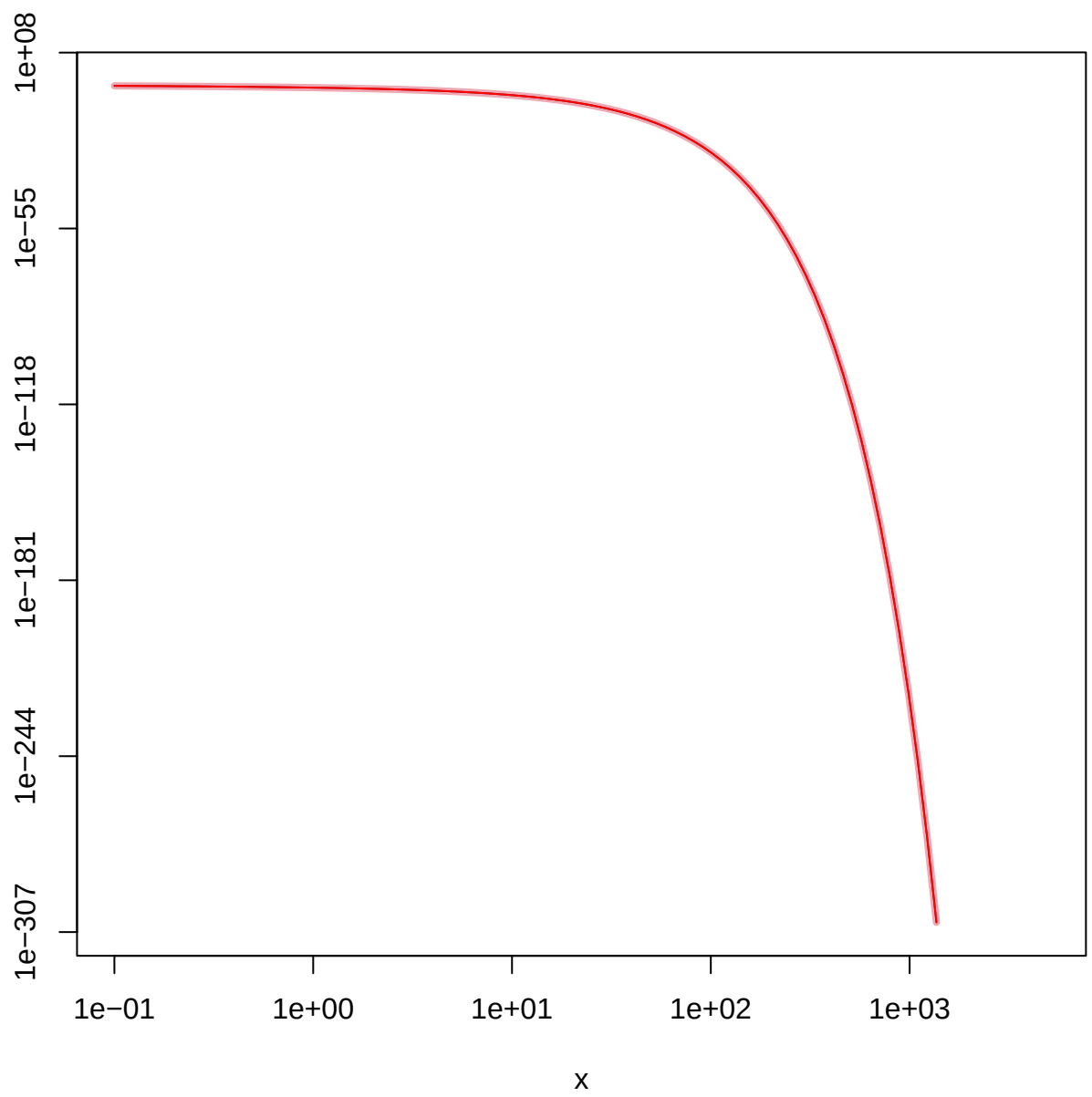


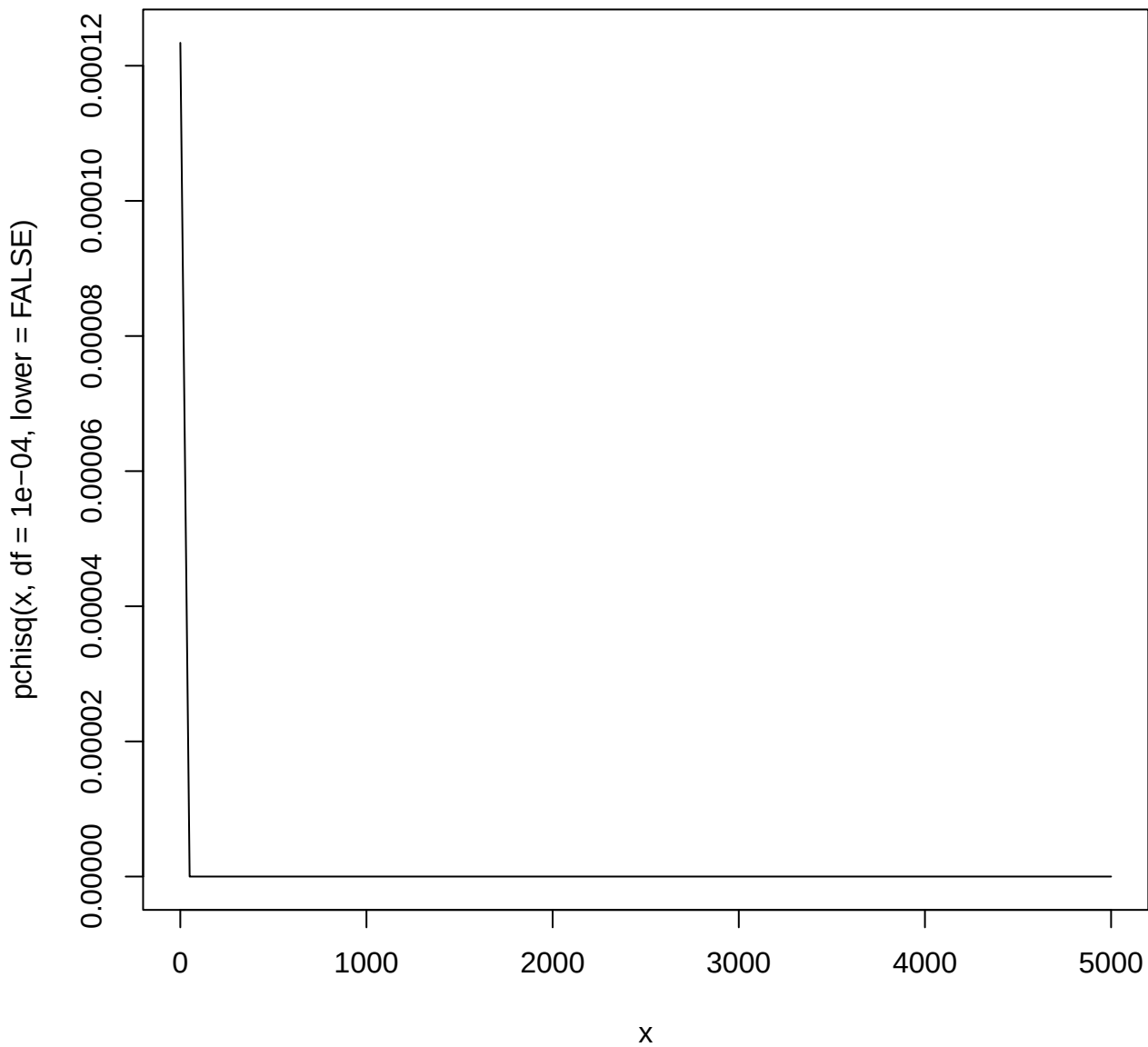


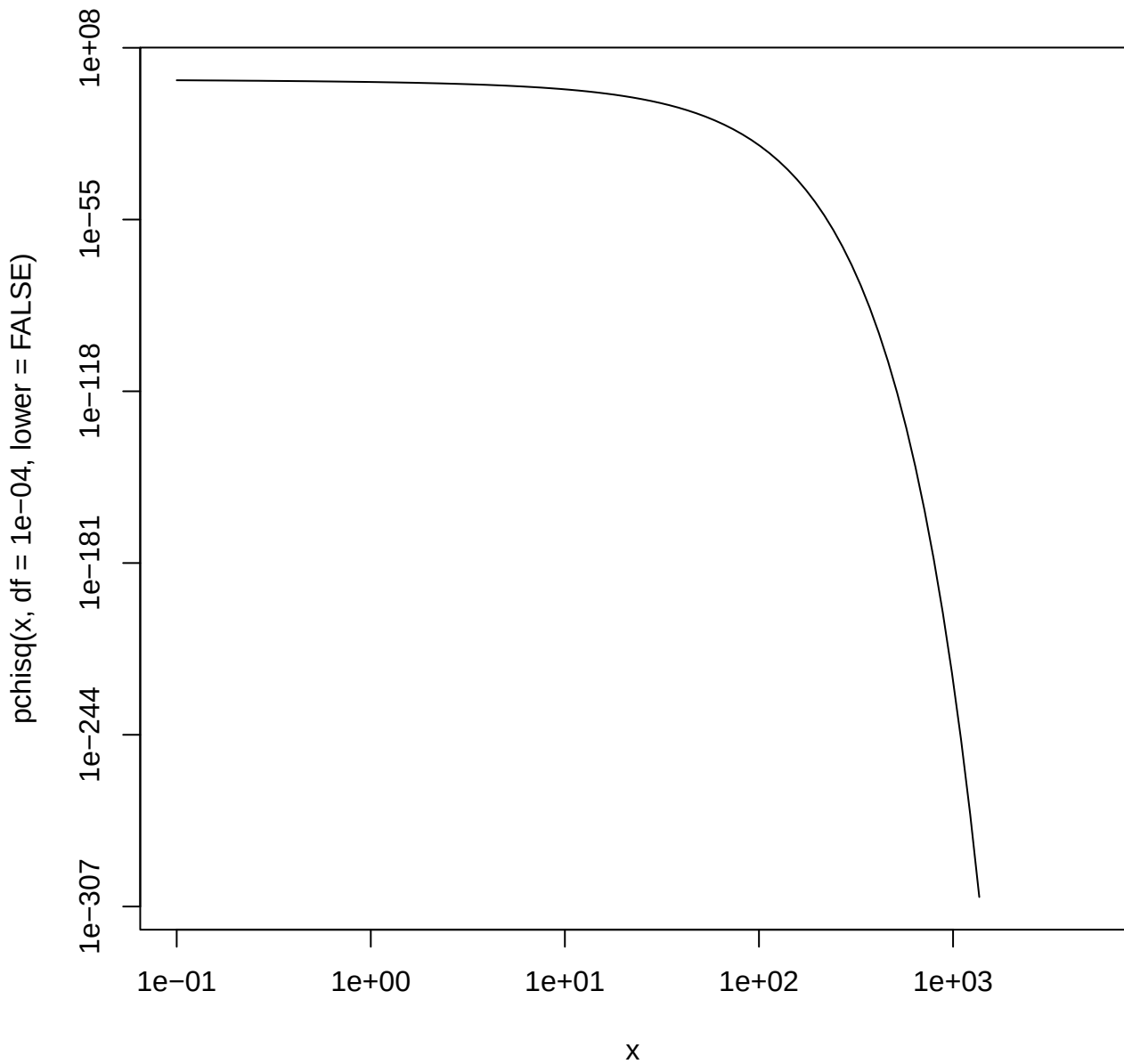
function(x) pchisq(x, df = 1e-04, ncp = 0, lower = FALSE)

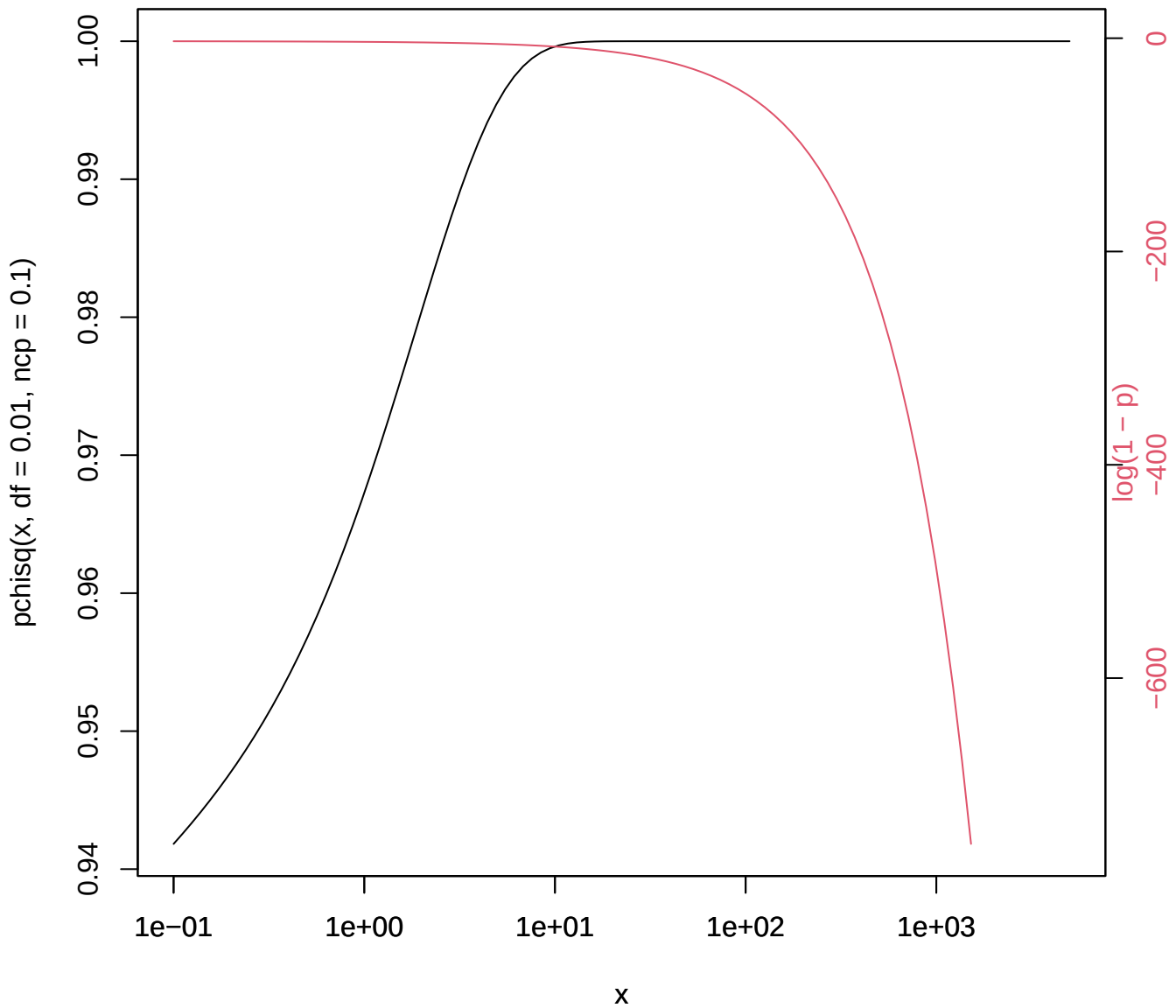


function(x) pchisq(x, df = 1e-04, ncp = 0, lower = FALSE)

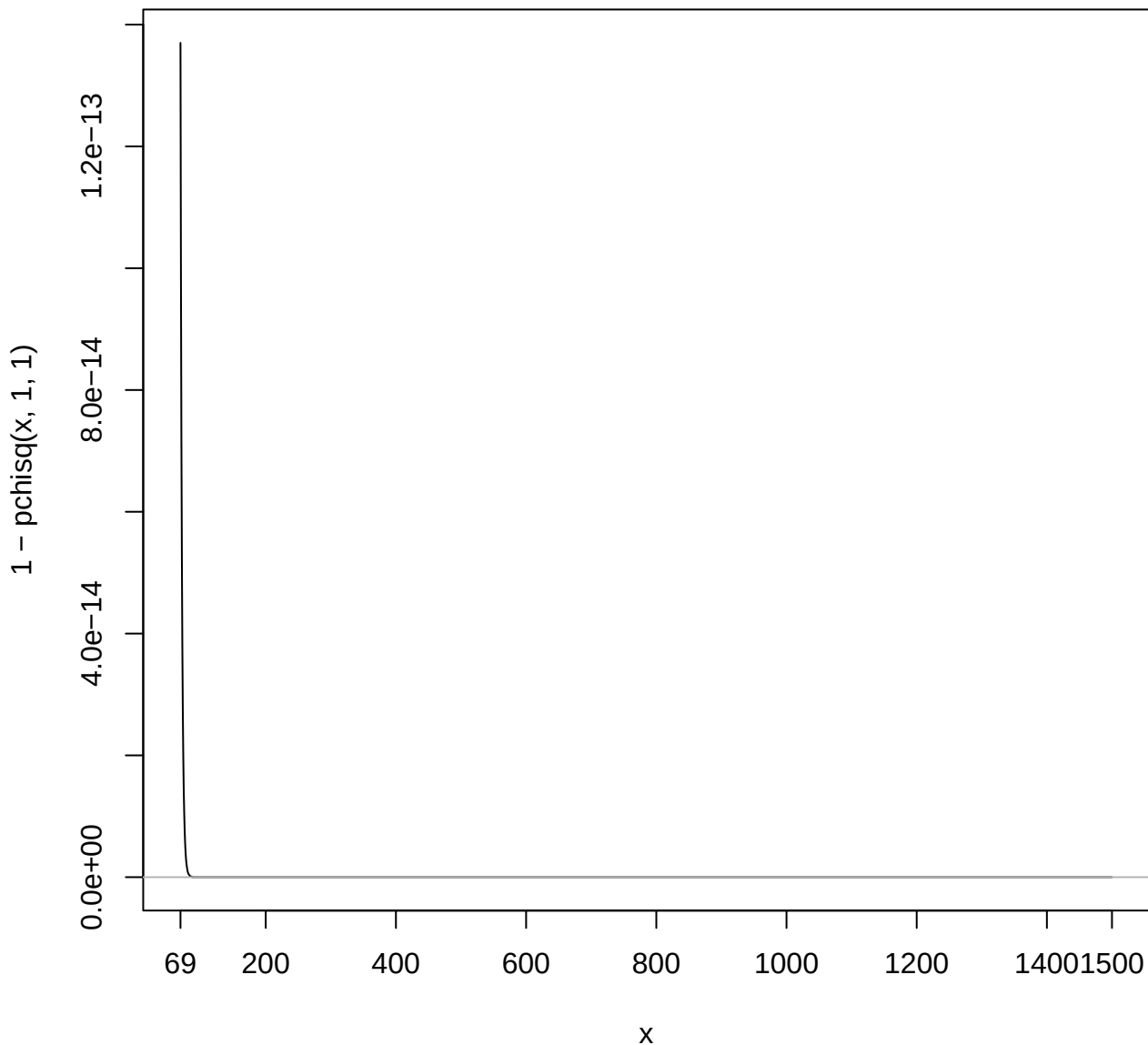




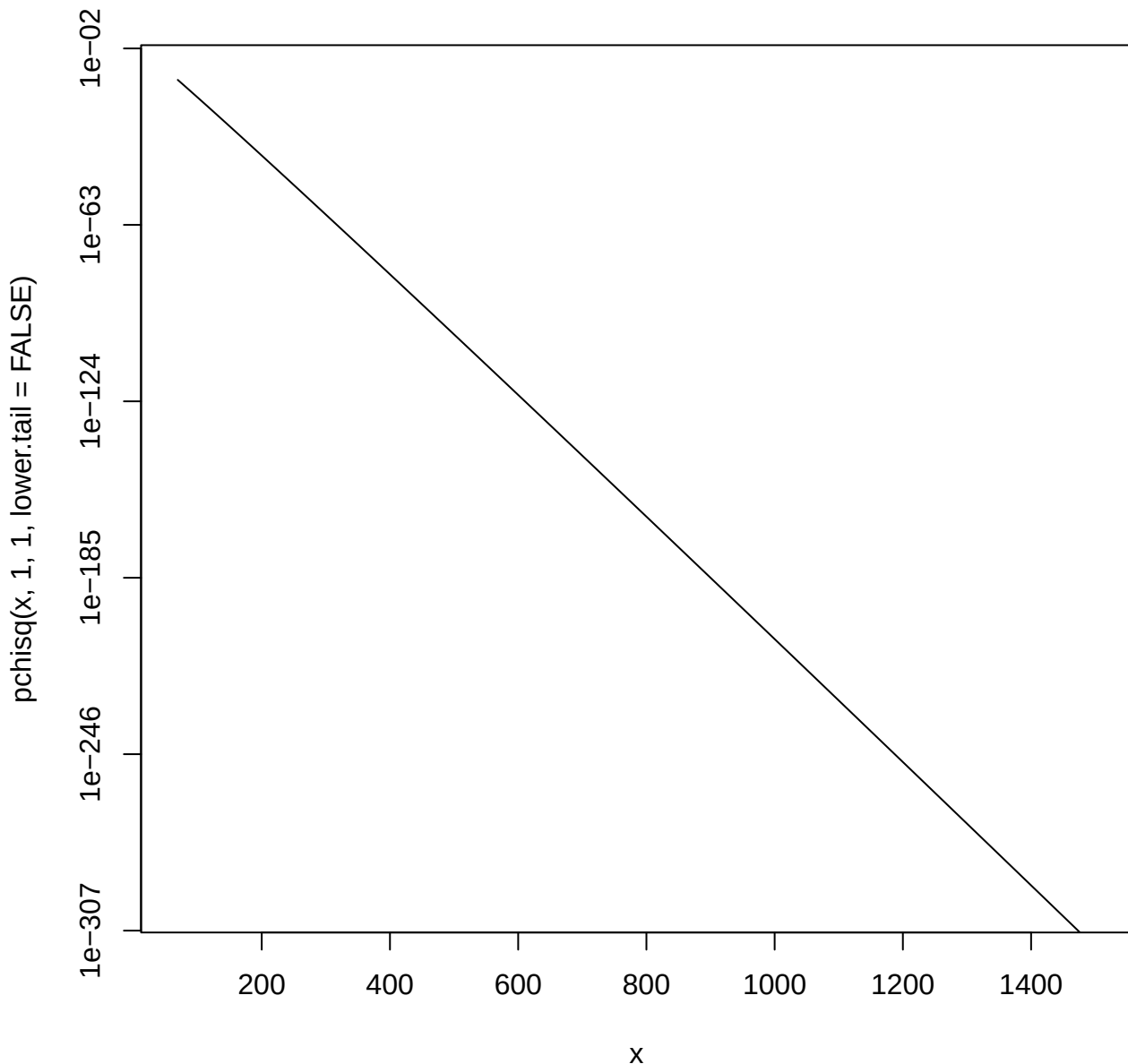




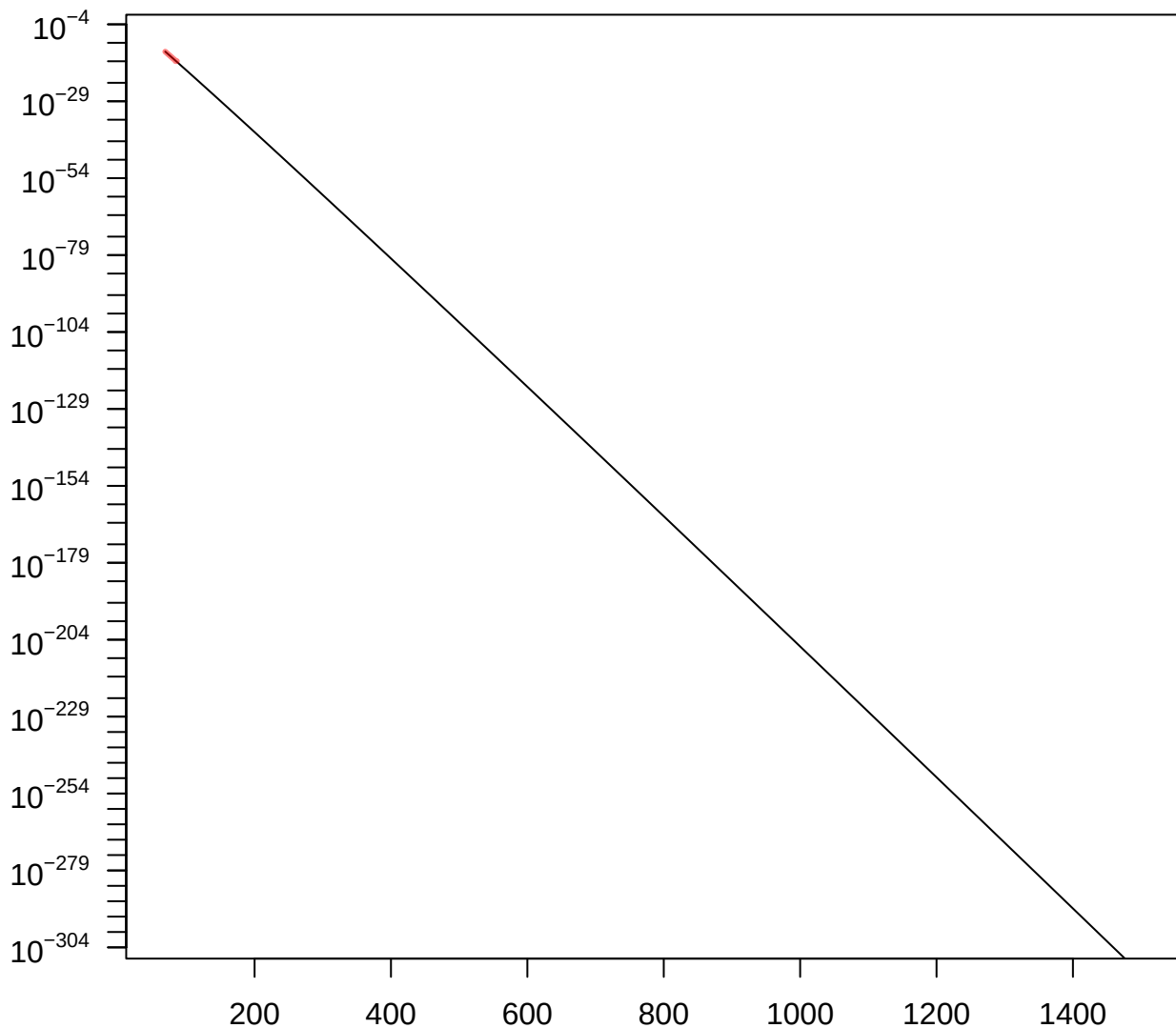
1-pchisq(x,1,1), x in [69, 1500]



1-pchisq(x,1,1), x in [69, 1500]



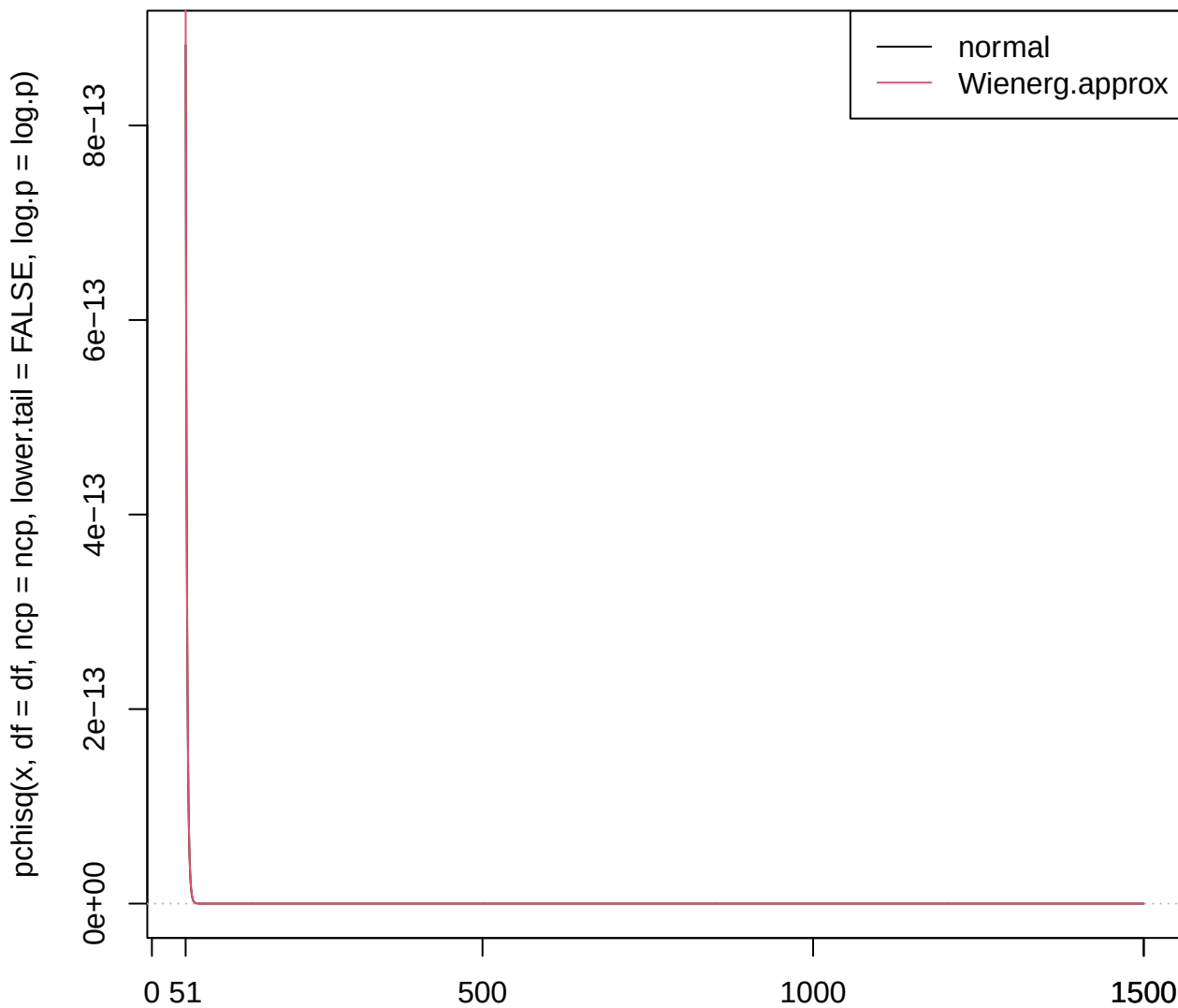
1-pchisq(x,1,1), x in [69, 1500]



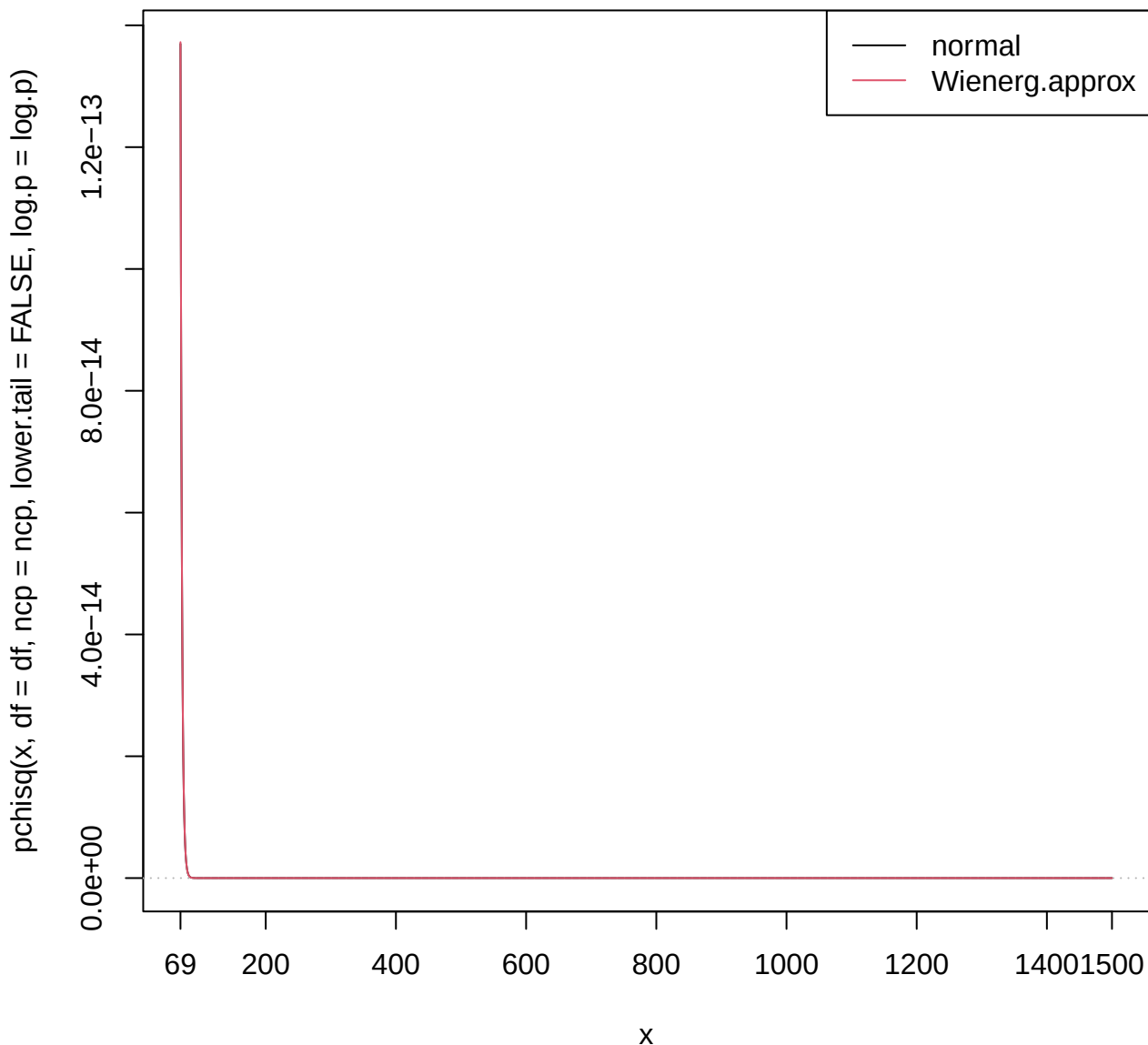
pc1\$x

R Under development (unstable) (2025-07-07 r88391 ucrt)

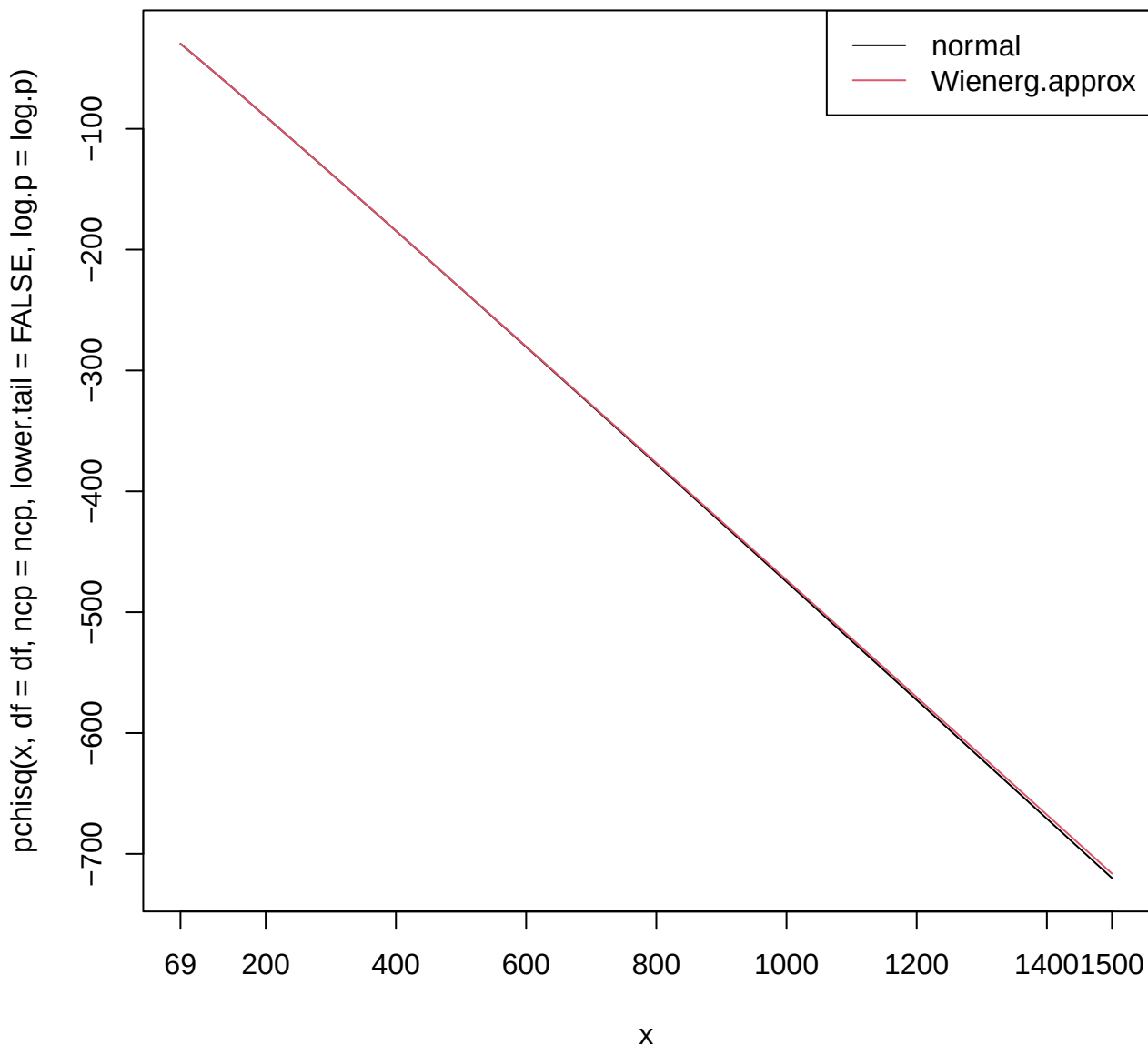
pchisq(x, 0.1, 0.1, lower=F), x in [51, 1500]



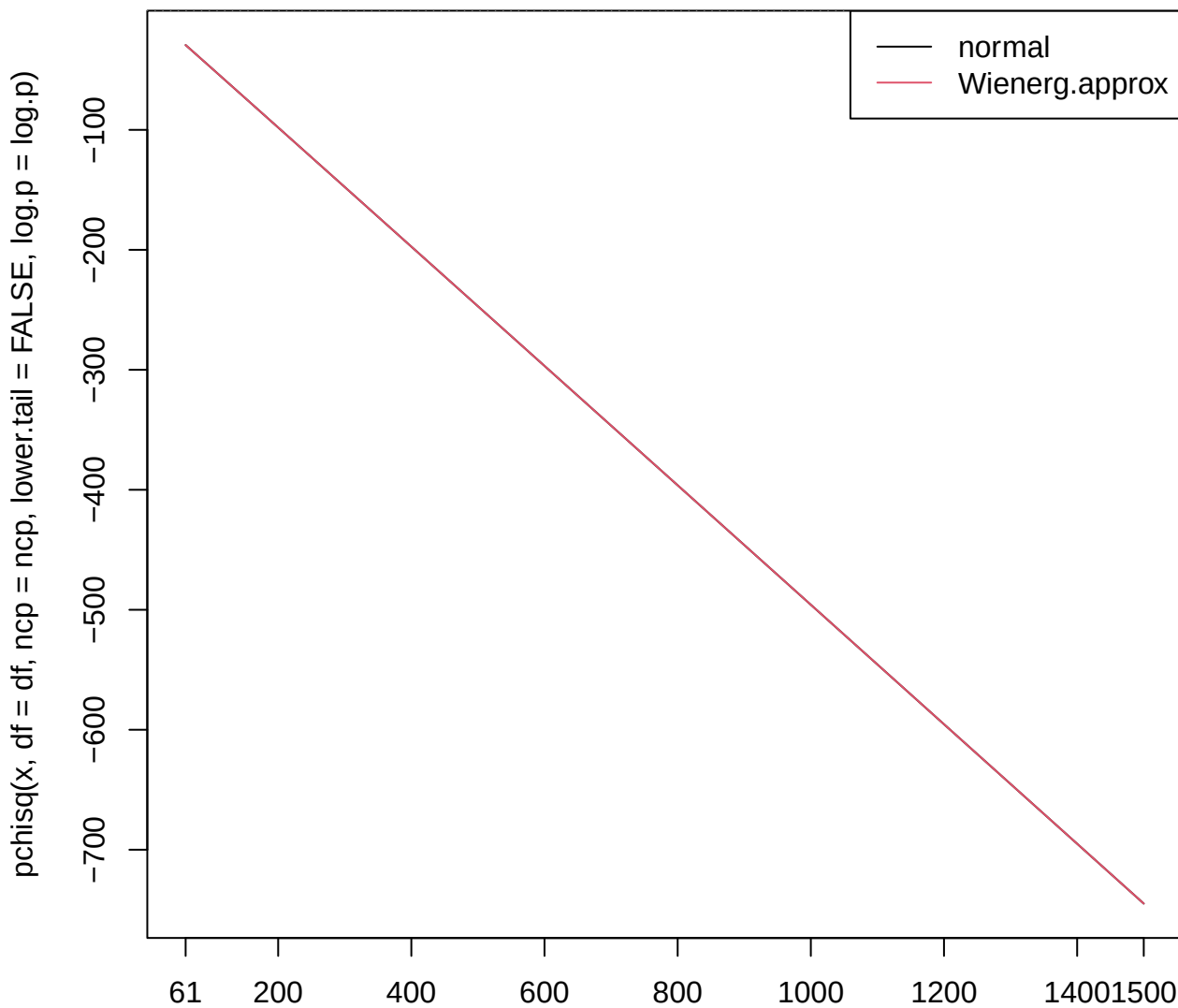
pchisq(x, 1, 1, lower=F), x in [69, 1500]



pchisq(x, 1, 1, lower=F, log=T), x in [69, 1500]



pchisq(x, 2.5, 0.02, lower=F, log=T), x in [61, 1500]

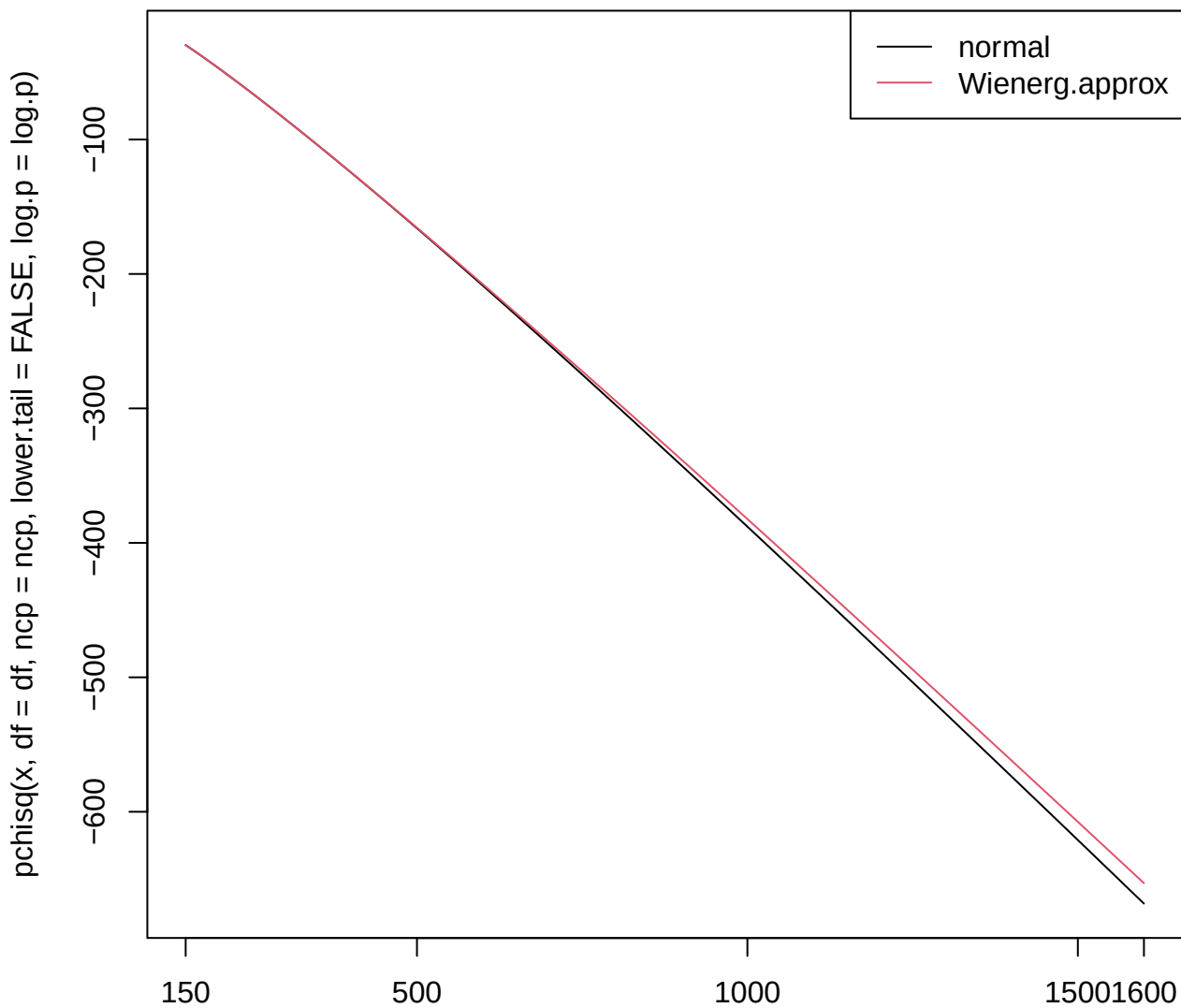


pchisq(x, df = df, ncp = ncp, lower.tail = FALSE, log.p = log.p)

x

R Under development (unstable) (2025-07-07 r88391 ucrt)

pchisq(x, 25, 10, lower=F, log=T), x in [150, 1600]

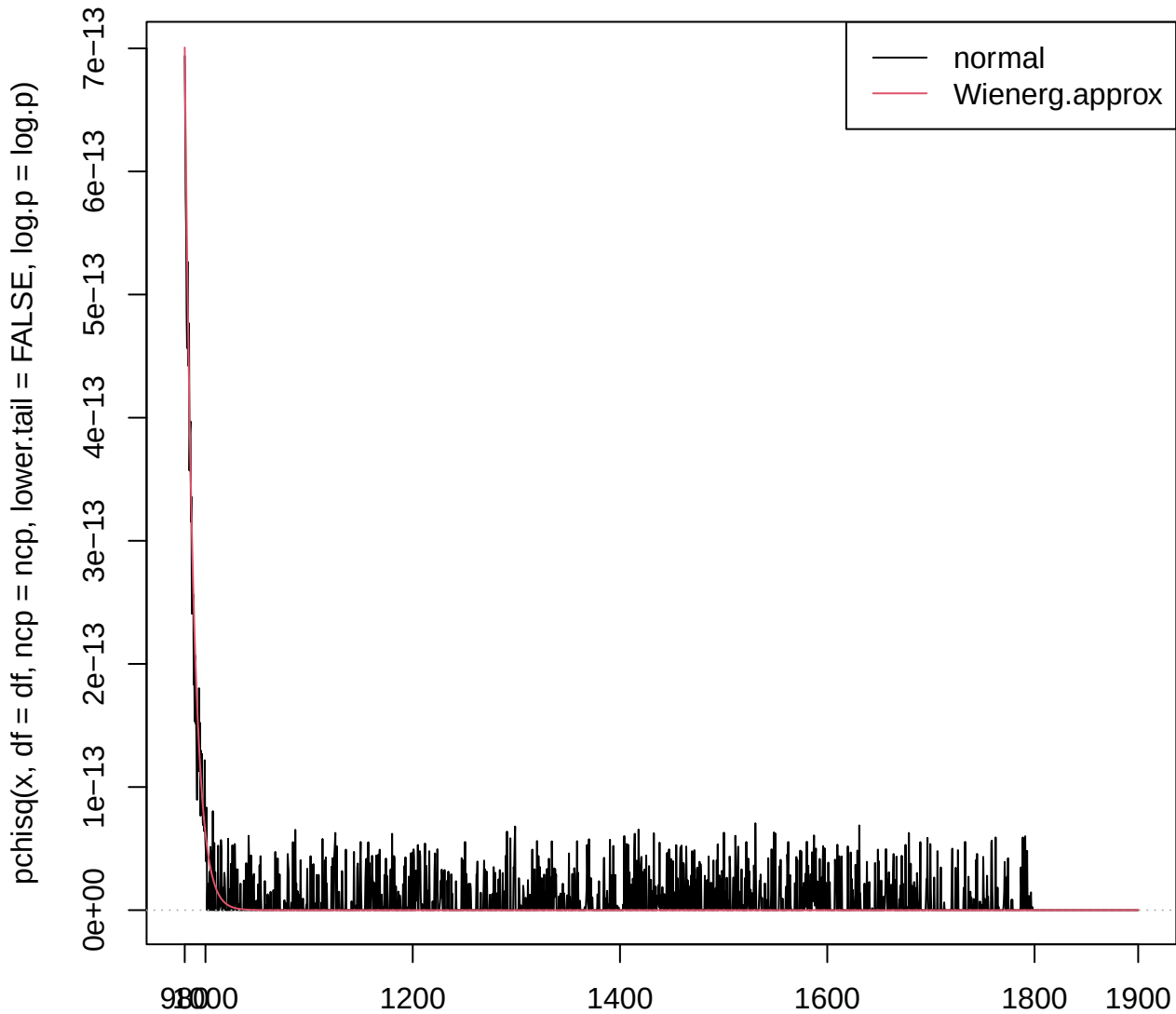


pchisq(x, df = df, ncp = ncp, lower.tail = FALSE, log.p = log.p)

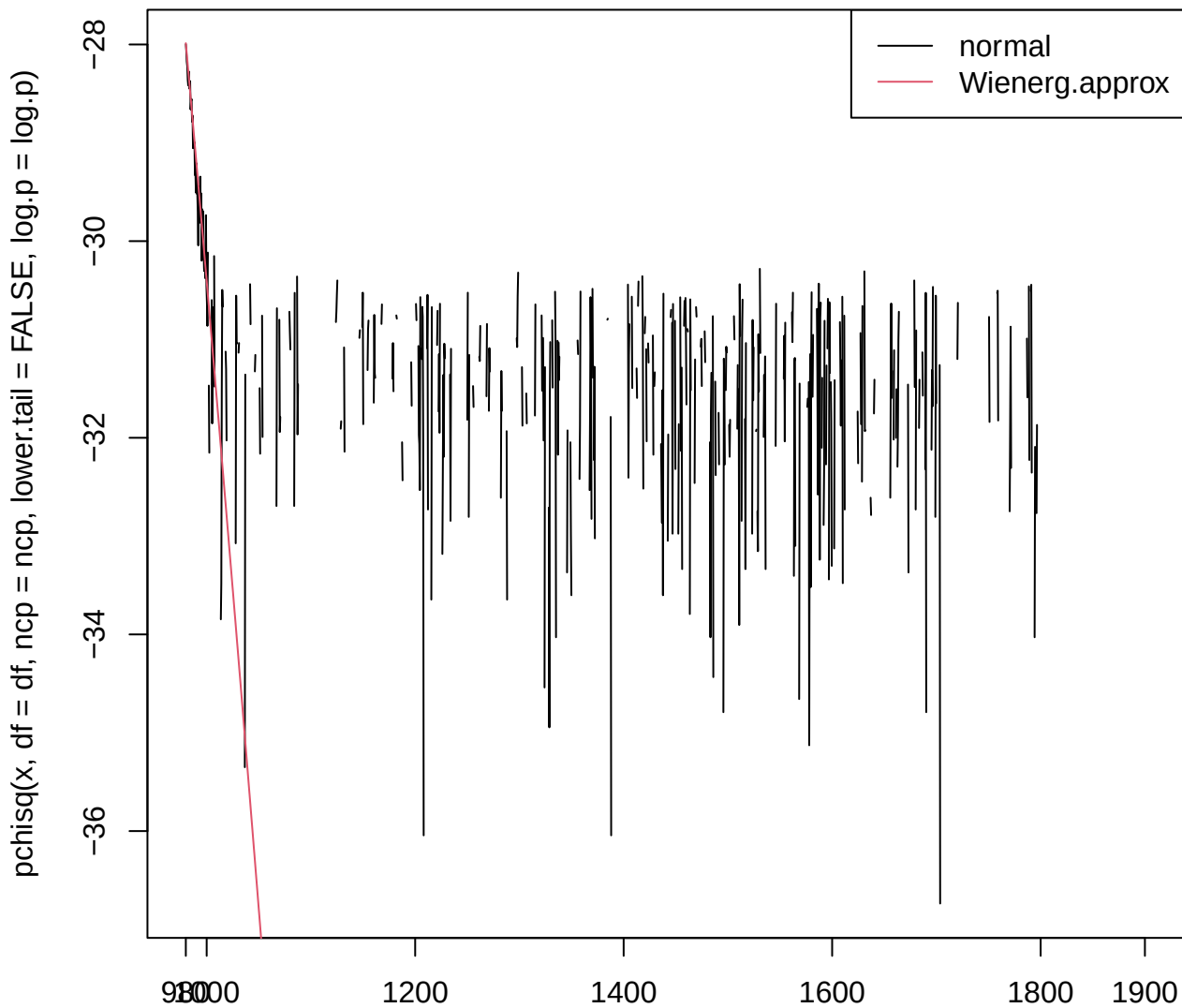
x

R Under development (unstable) (2025-07-07 r88391 ucrt)

pchisq(x, 100, 500, lower=F), x in [980, 1900]



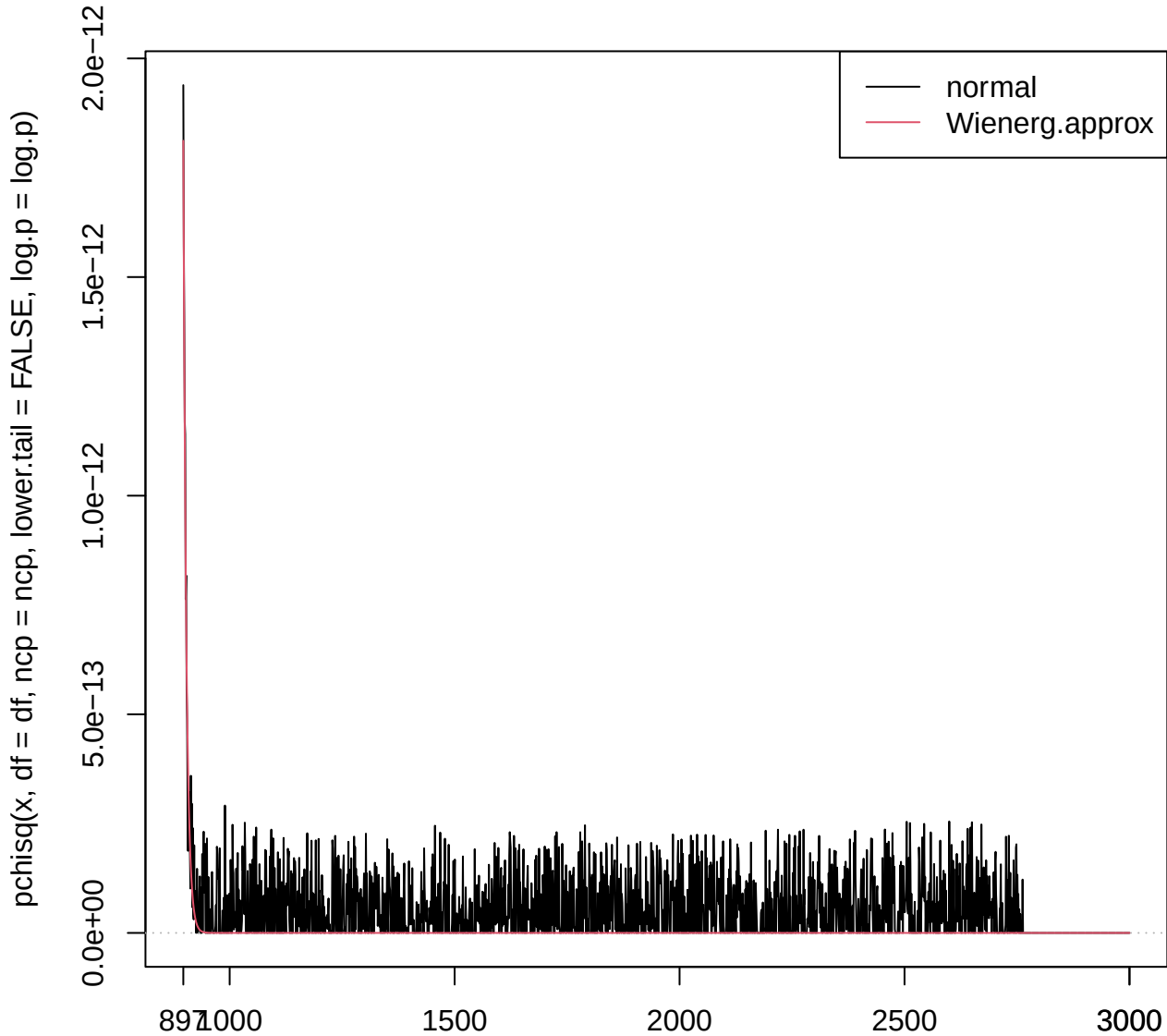
pchisq(x, 100, 500, lower=F, log=T), x in [980, 1900]



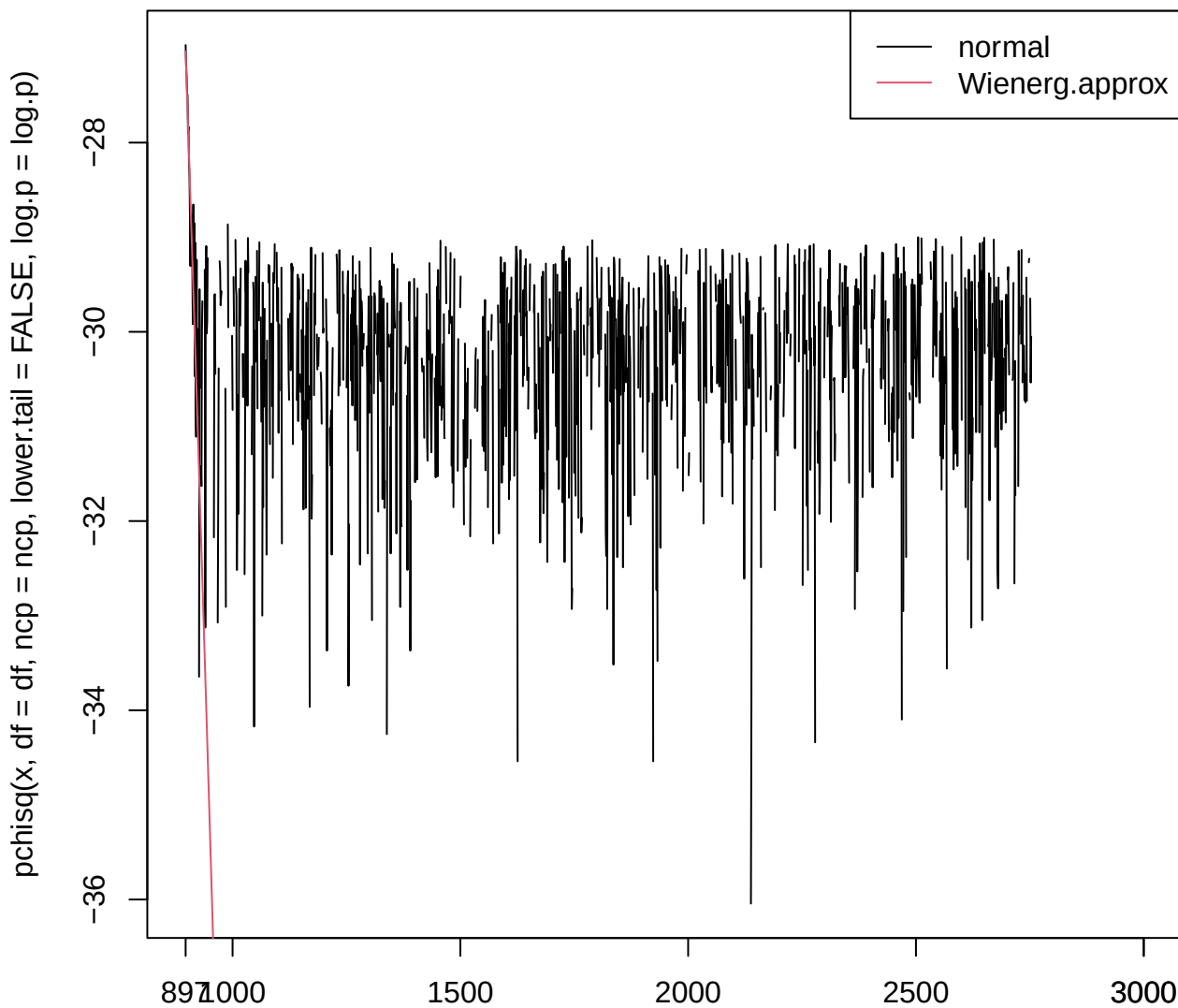
x

R Under development (unstable) (2025-07-07 r88391 ucrt)

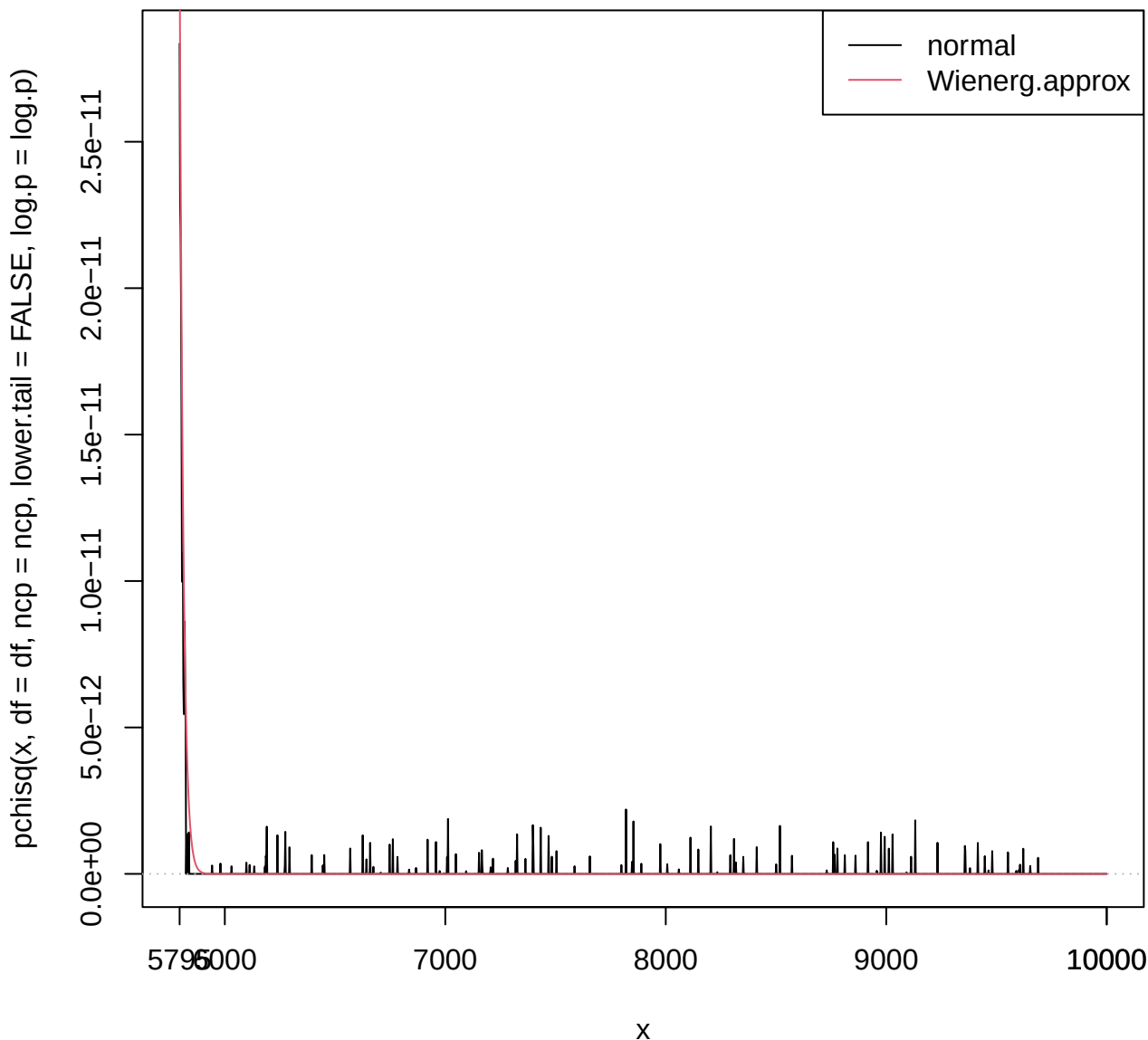
pchisq(x, 500, 100, lower=F), x in [897, 3000]



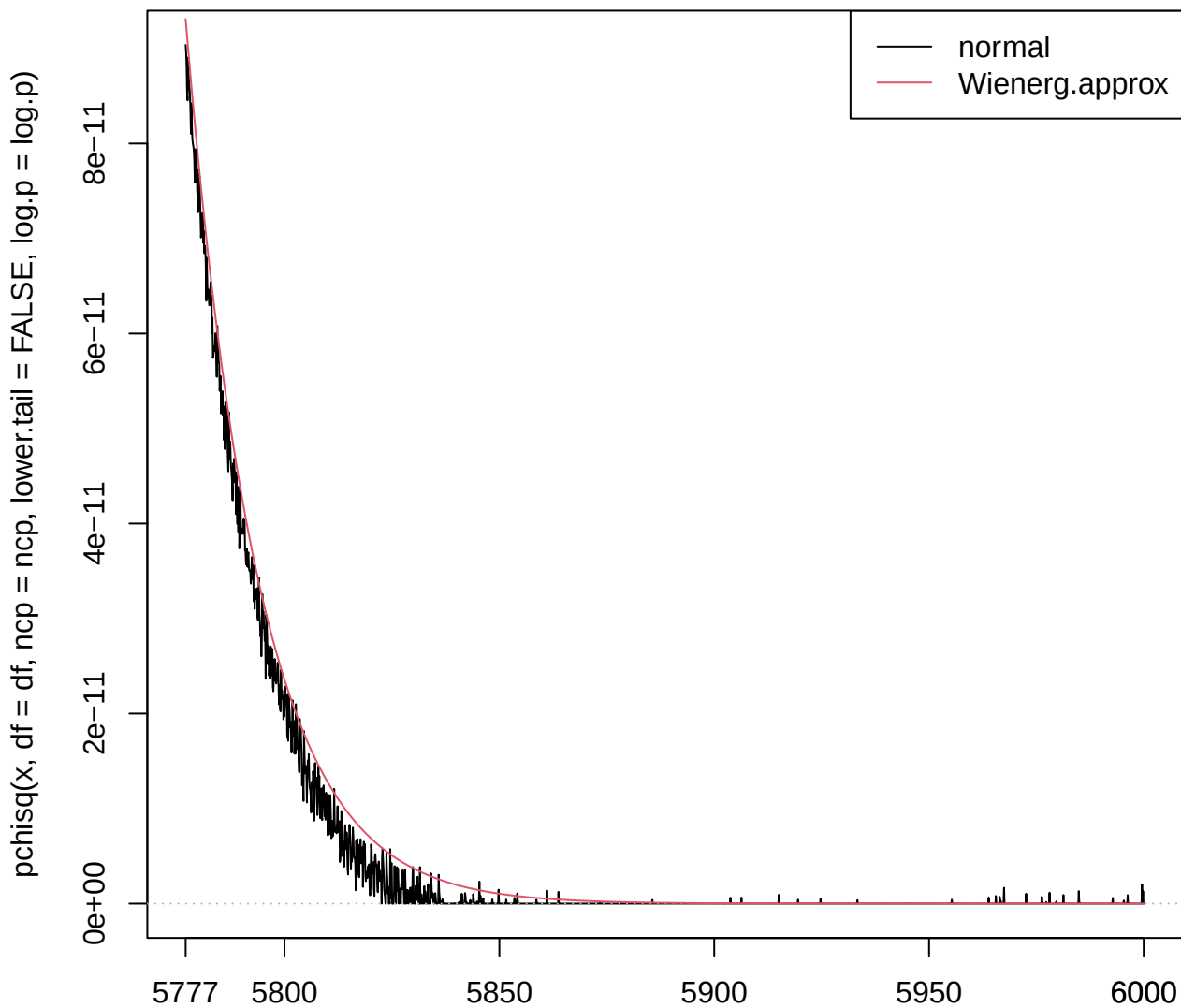
pchisq(x, 500, 100, lower=F, log=T), x in [897, 3000]



pchisq(x, 5000, 100, lower=F), x in [5795, 1e+04]



pchisq(x, 5000, 100, lower=F), x in [5777, 6000]

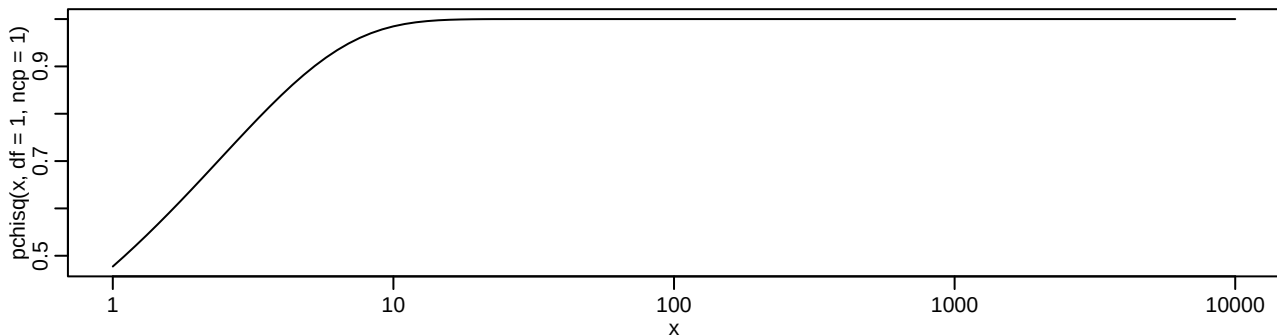


x

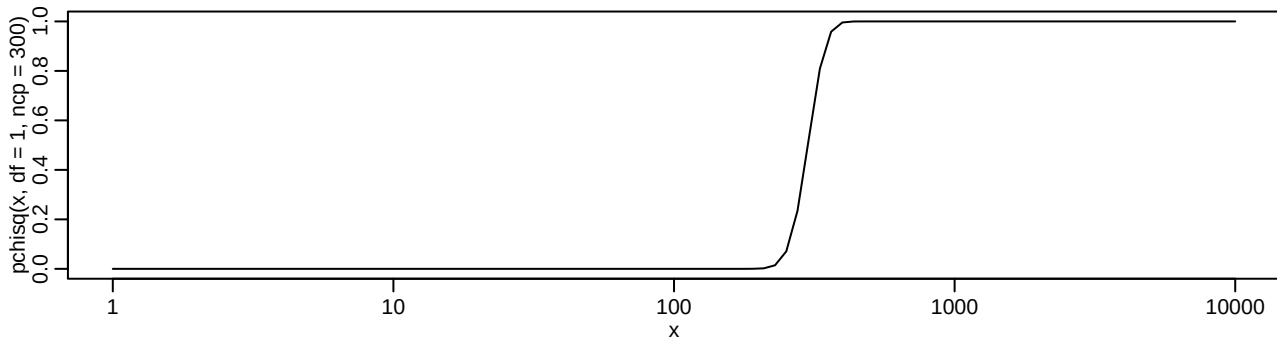
R Under development (unstable) (2025-07-07 r88391 ucrt)

pchisq(x >= 1497, *, ncp=) BUG (no longer!)

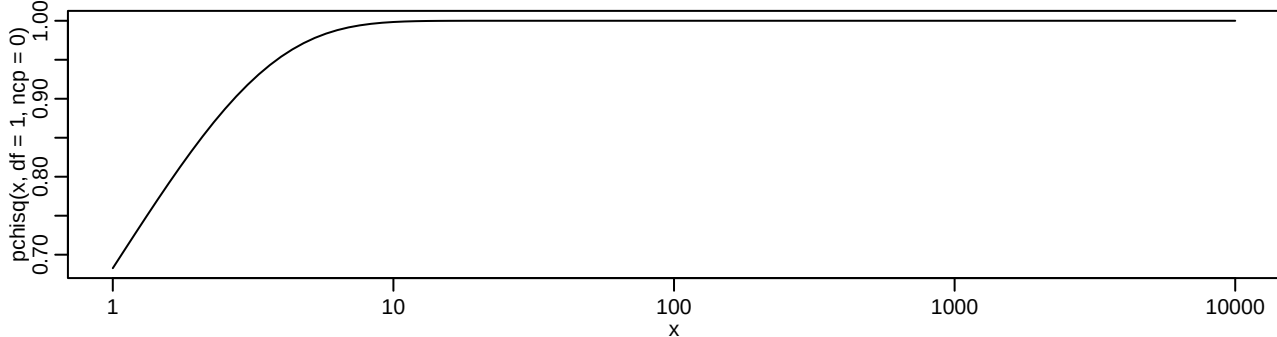
ncp = 1



ncp = 300

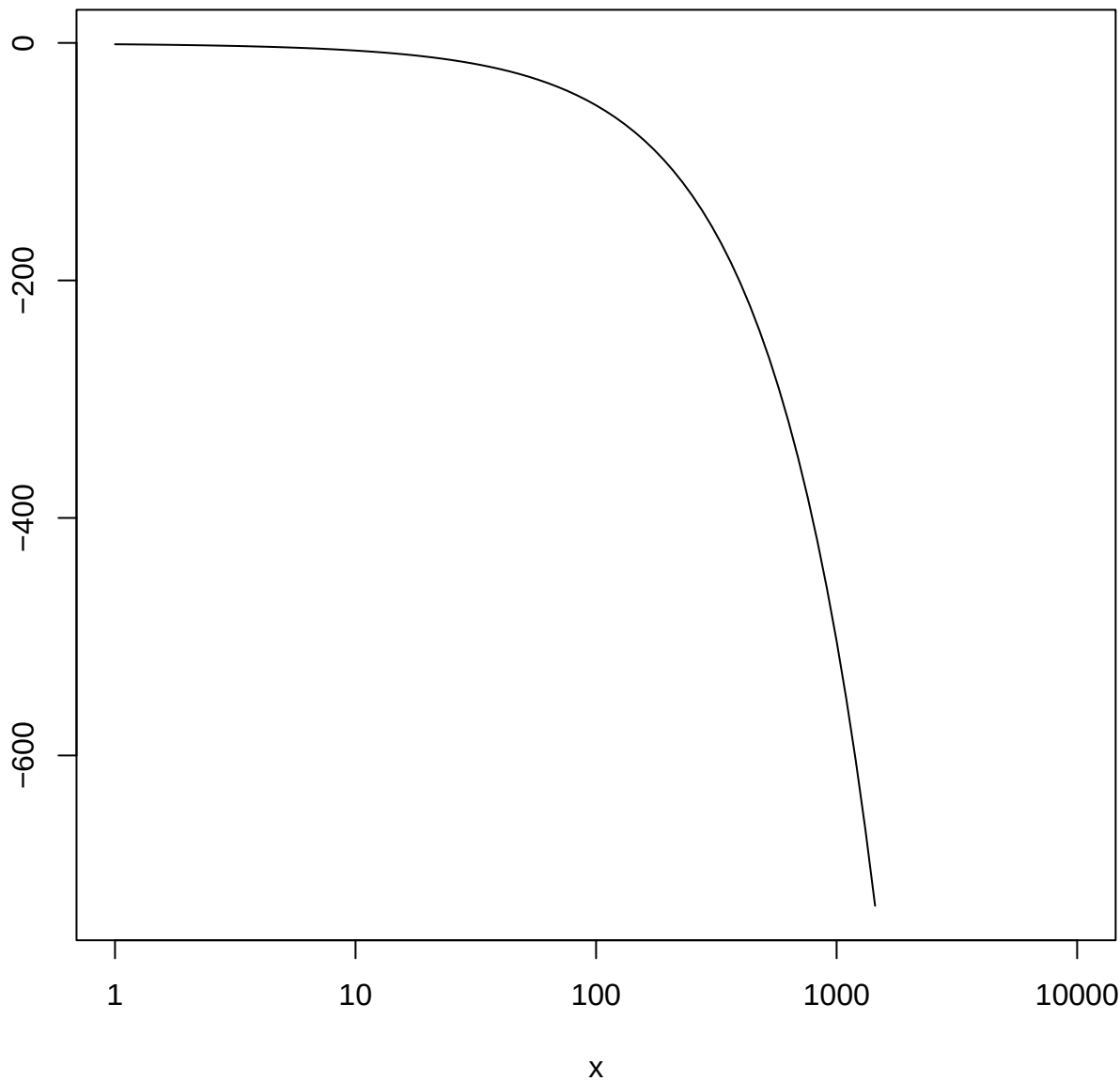


ncp = 0

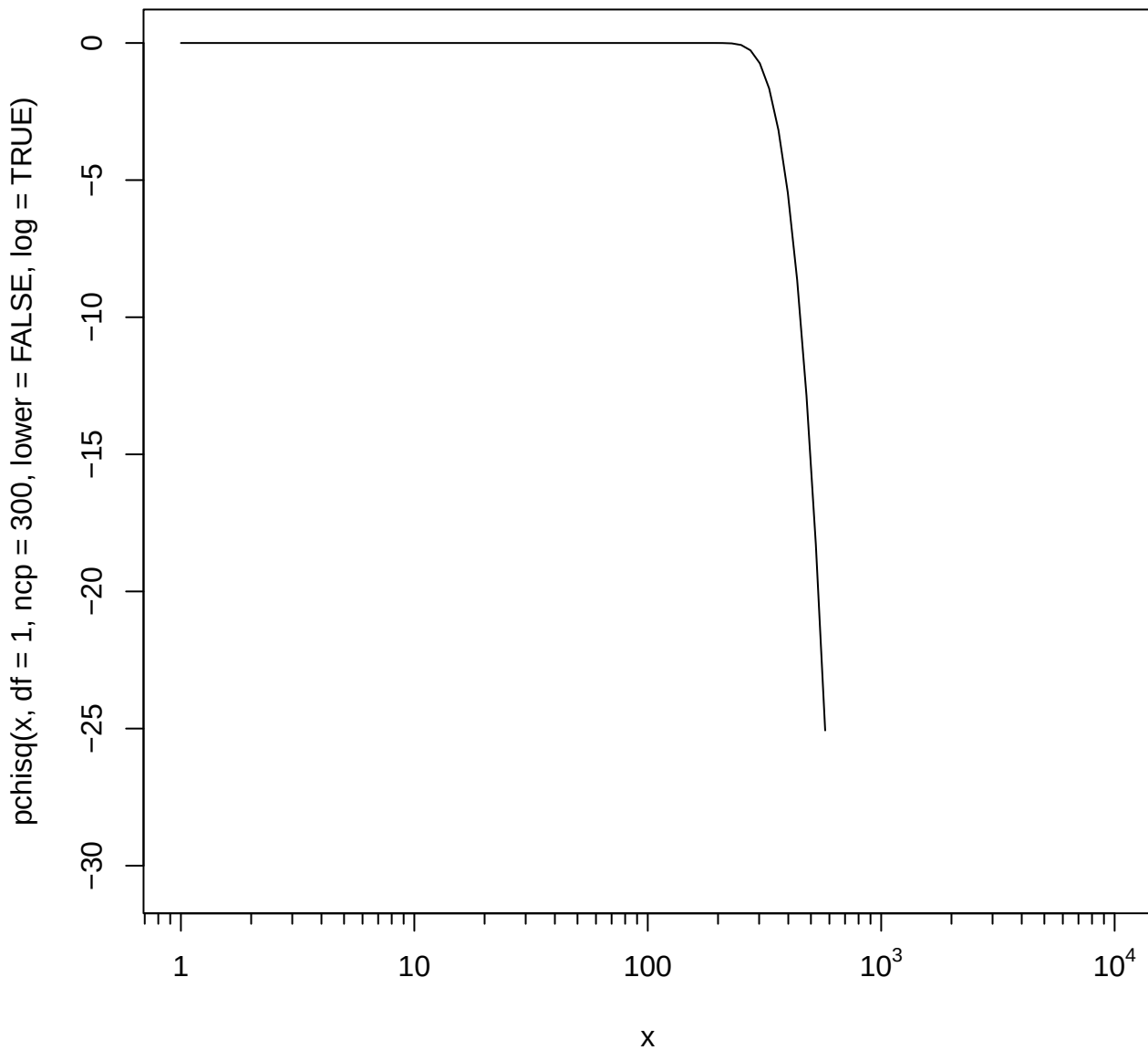


ncp = 0

pchisq(x, df = 1, ncp = 0, lower = FALSE, log = TRUE)

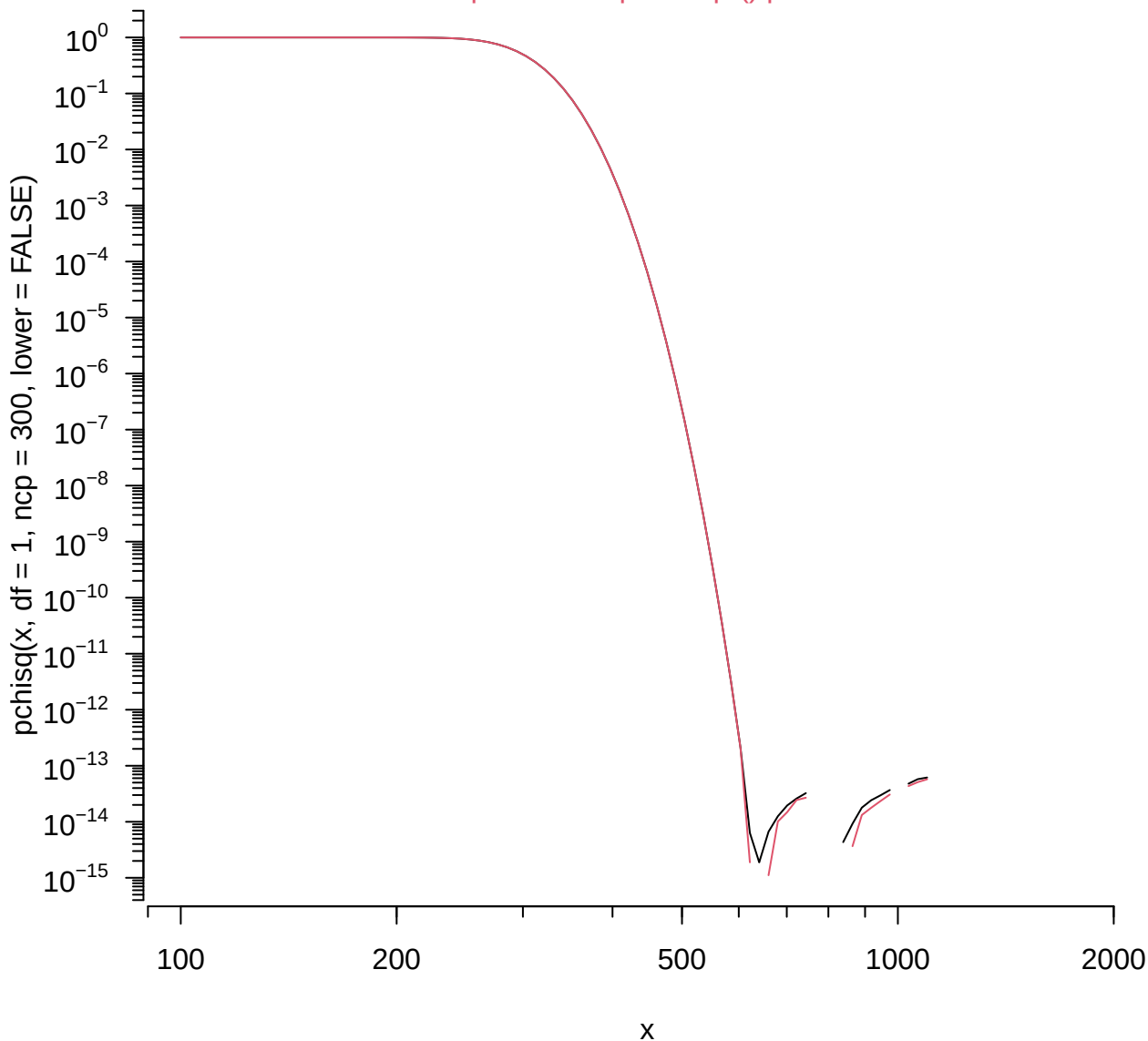


ncp = 300, log=TRUE

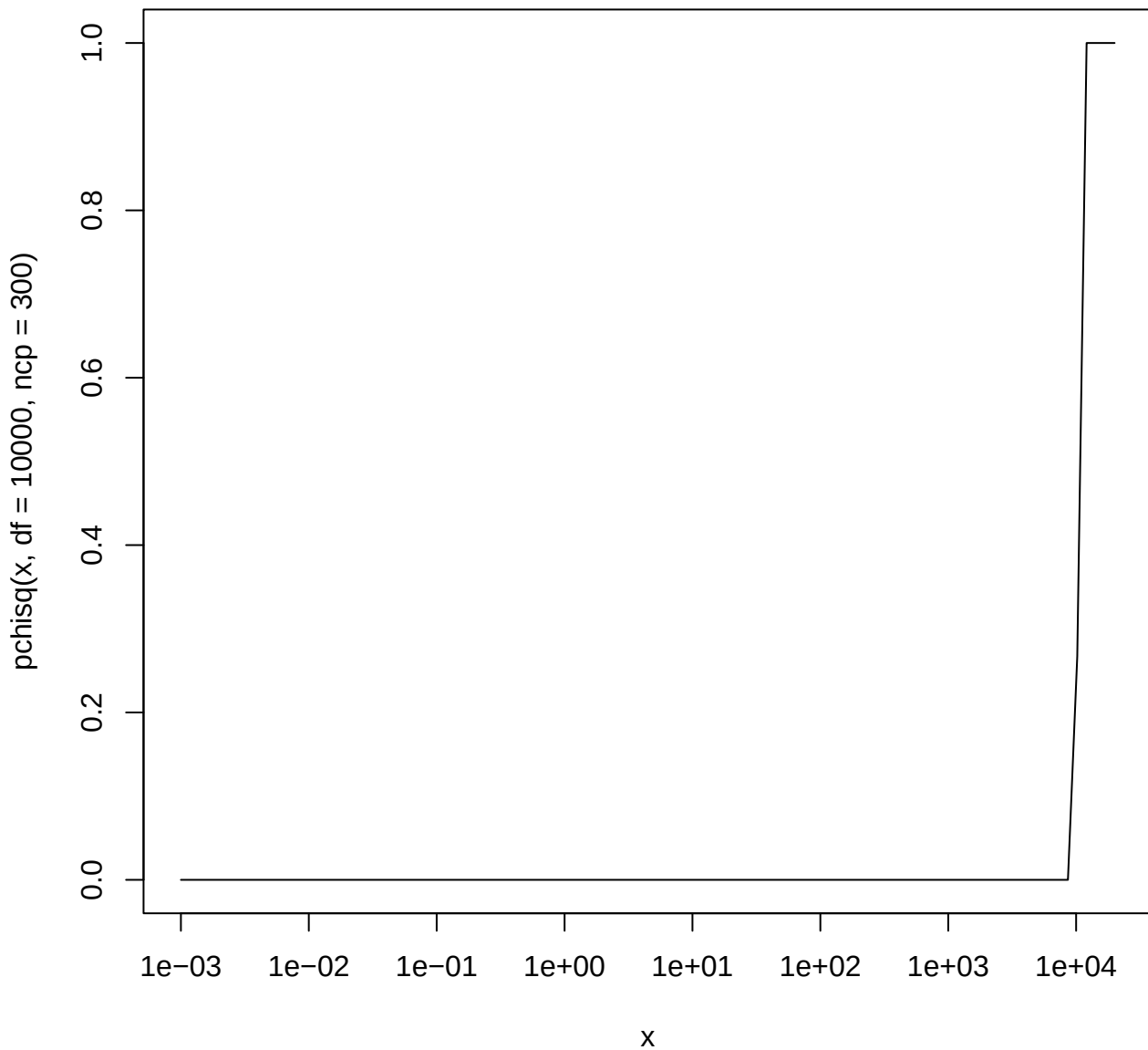


ncp = 300, upper tail

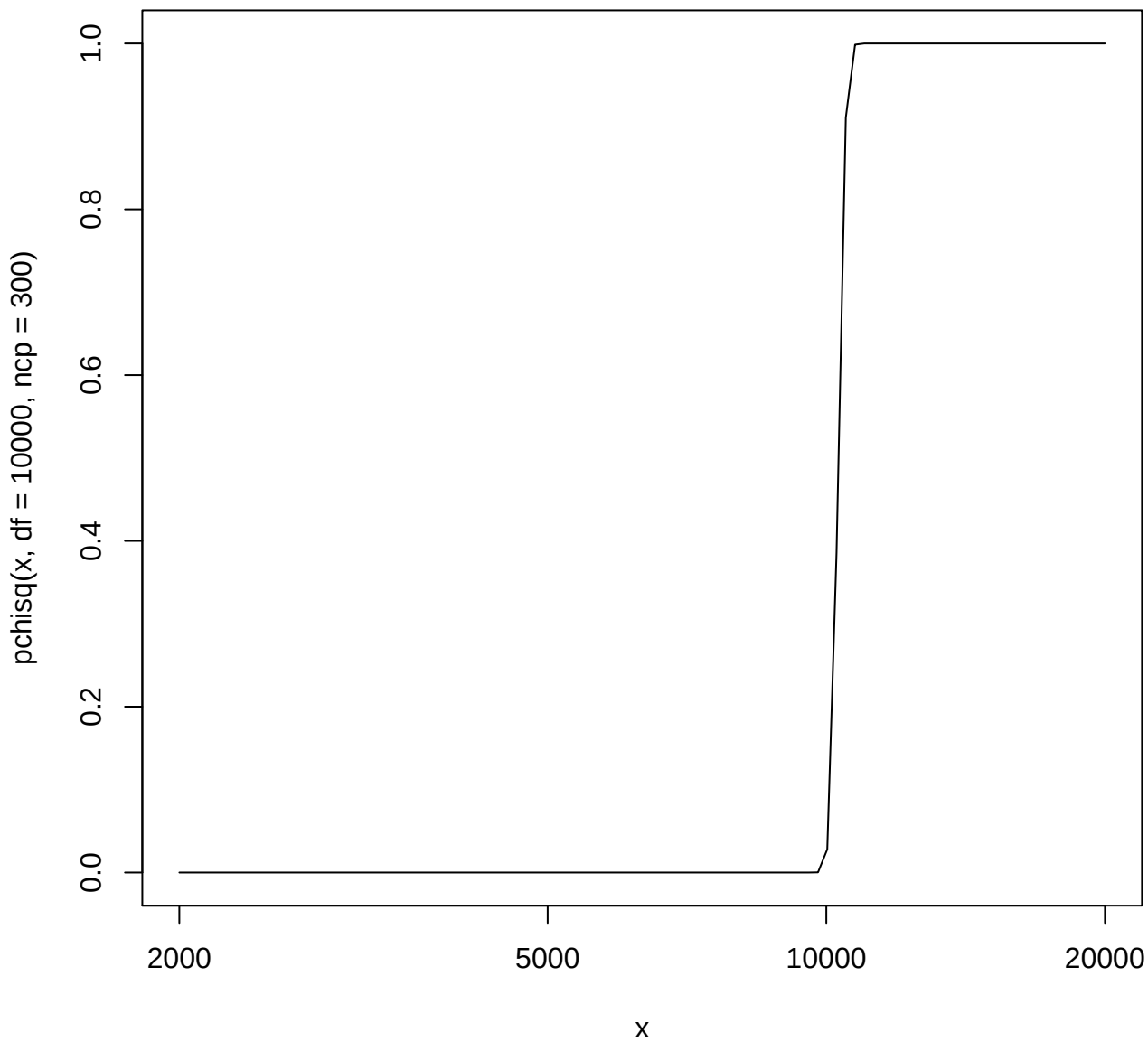
ncp = 300 -- pnchisqV() pure R



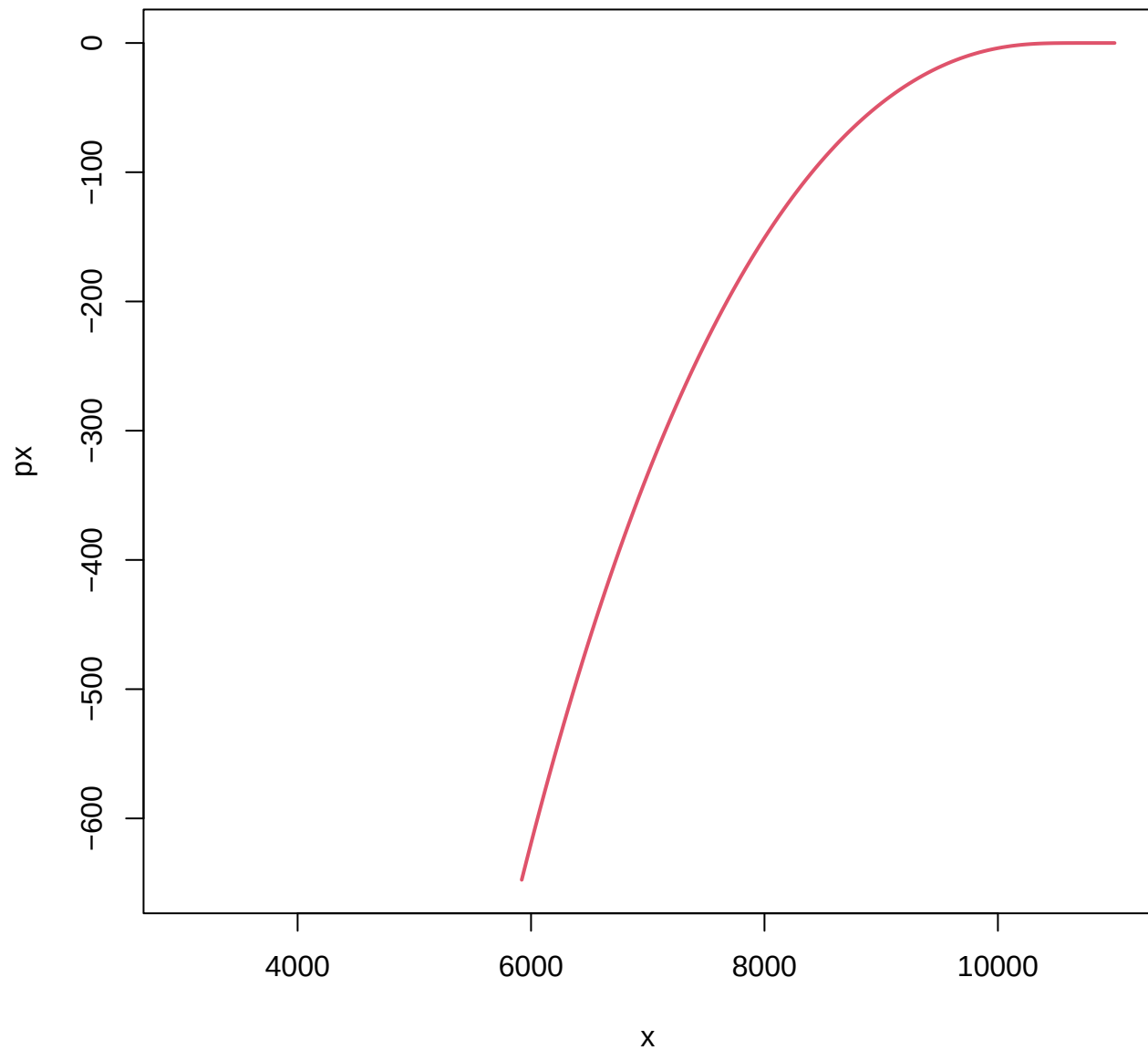
ncp = 300



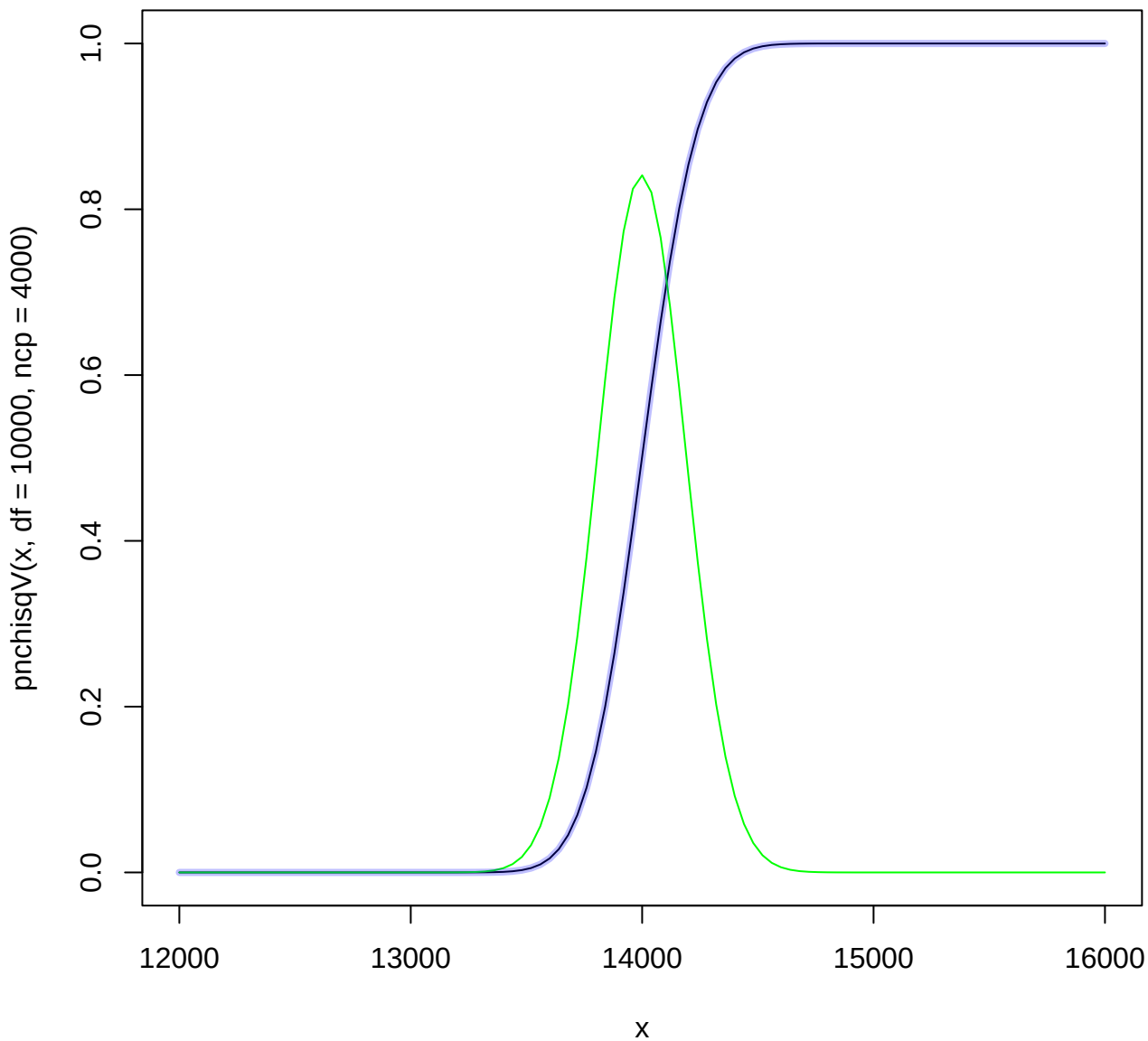
ncp = 300



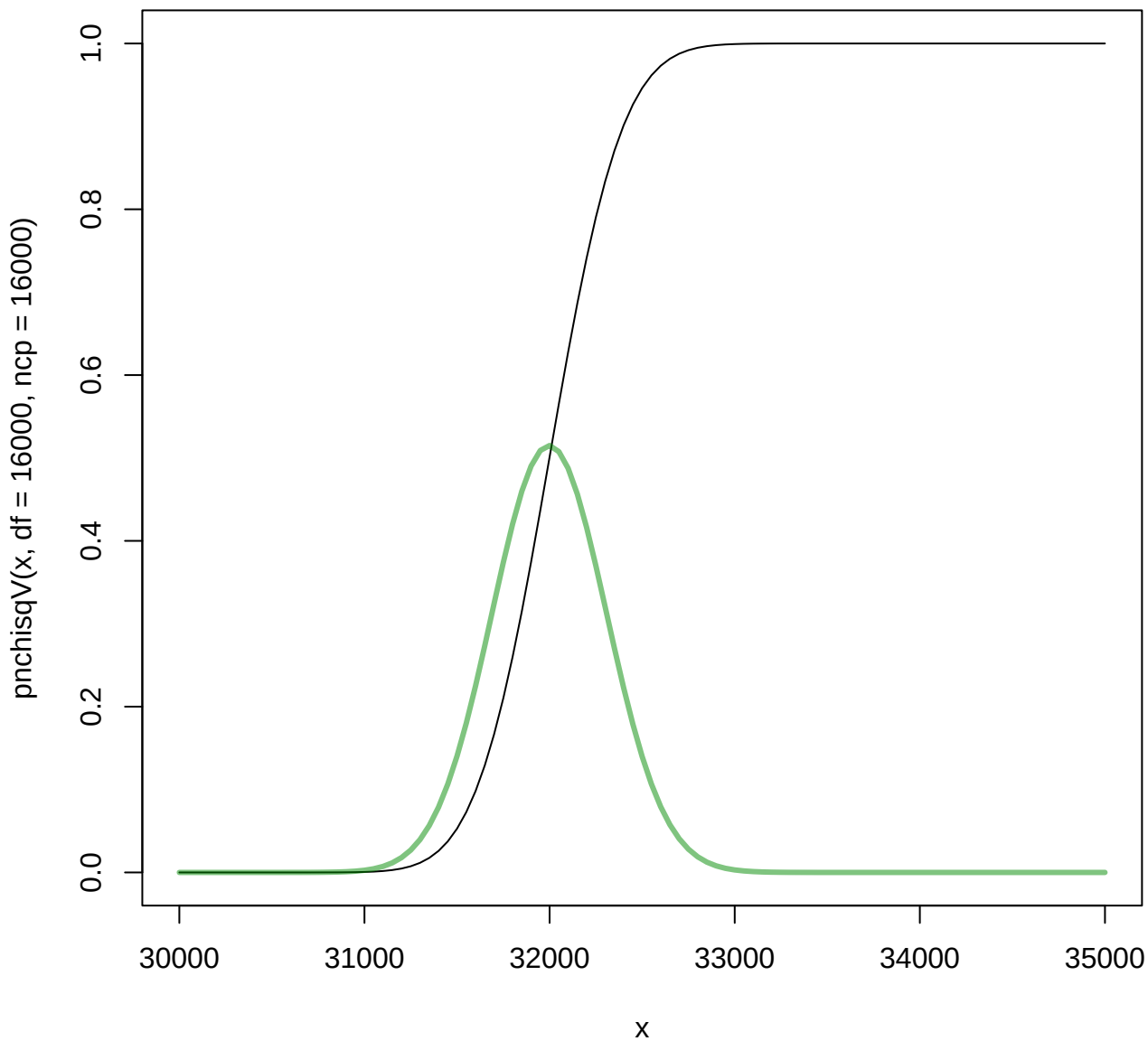
`pchisq(*, df=10000,ncp=300, log=TRUE))`



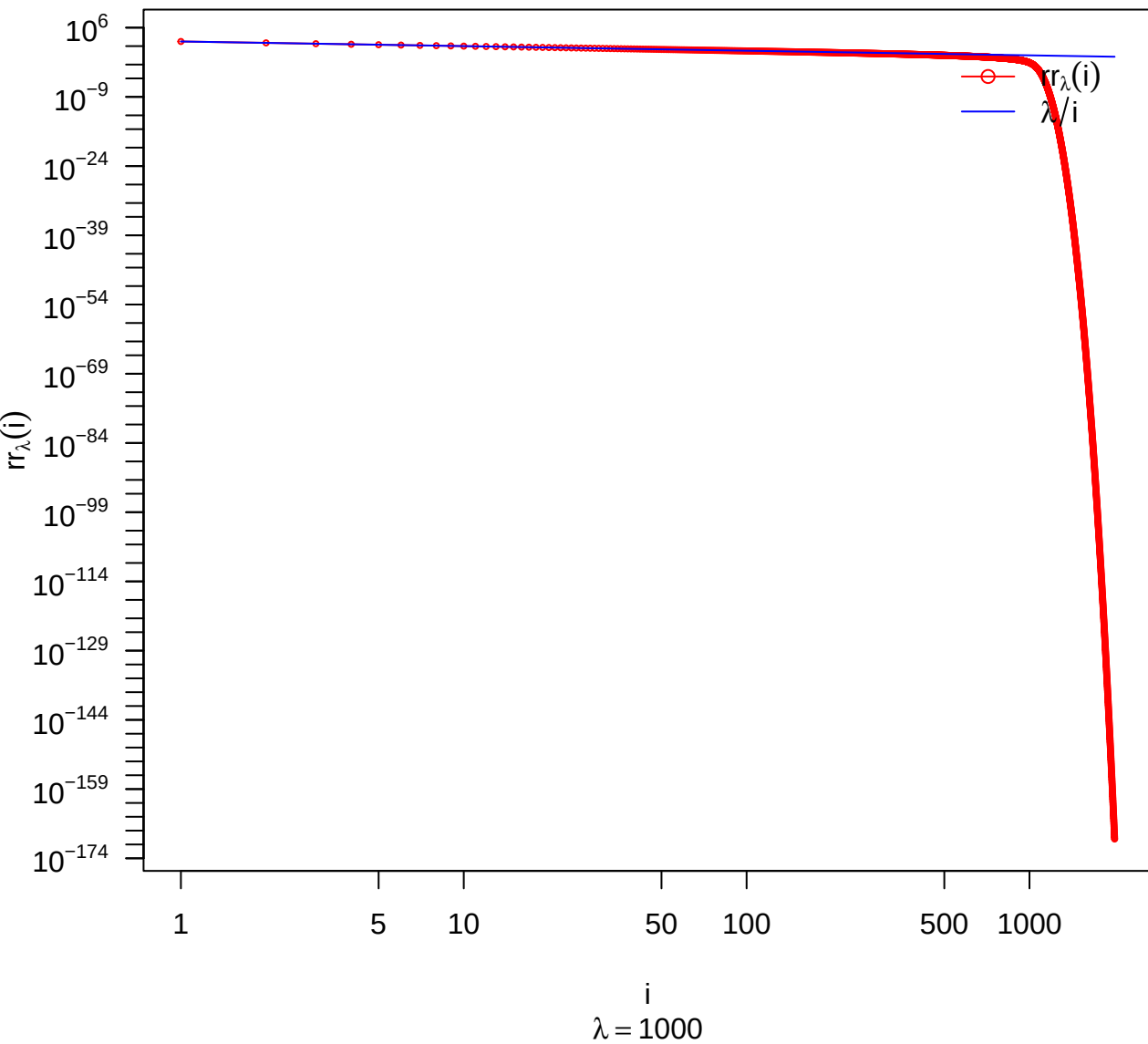
df = 10000, ncp = 4000



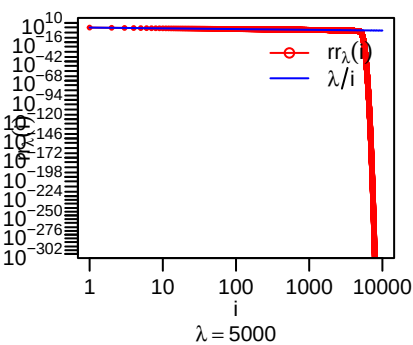
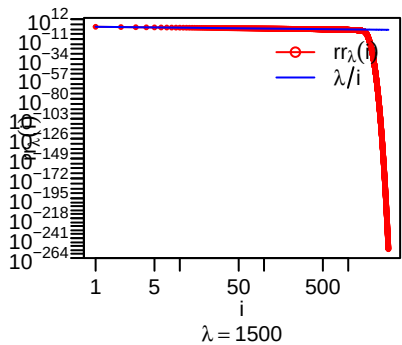
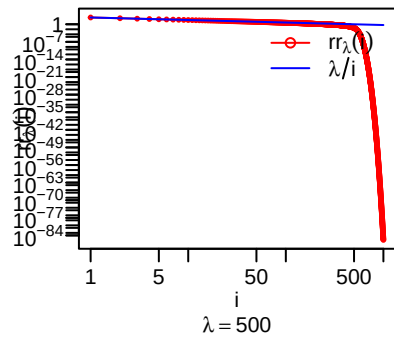
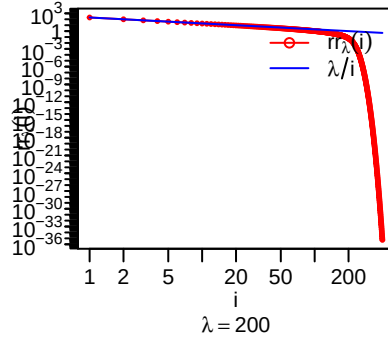
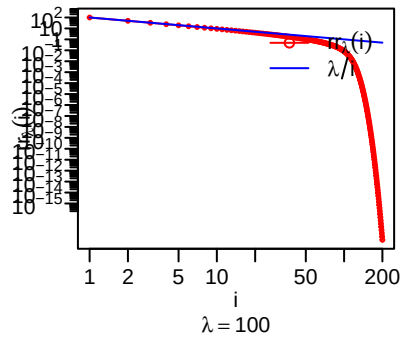
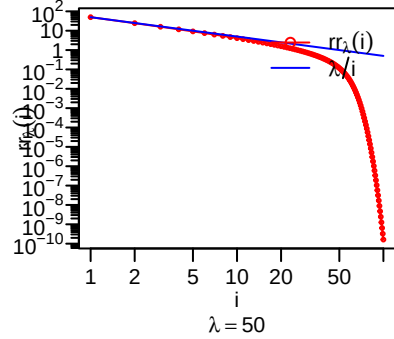
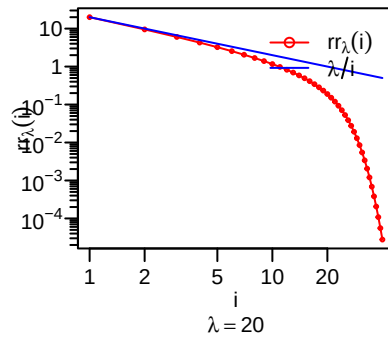
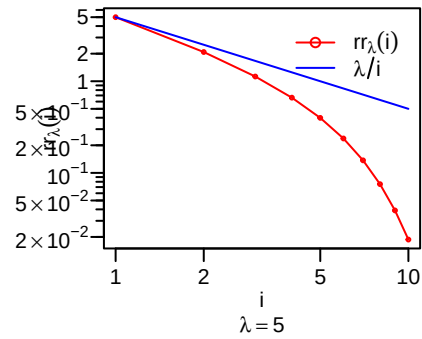
df = 16e3, ncp = 16e3



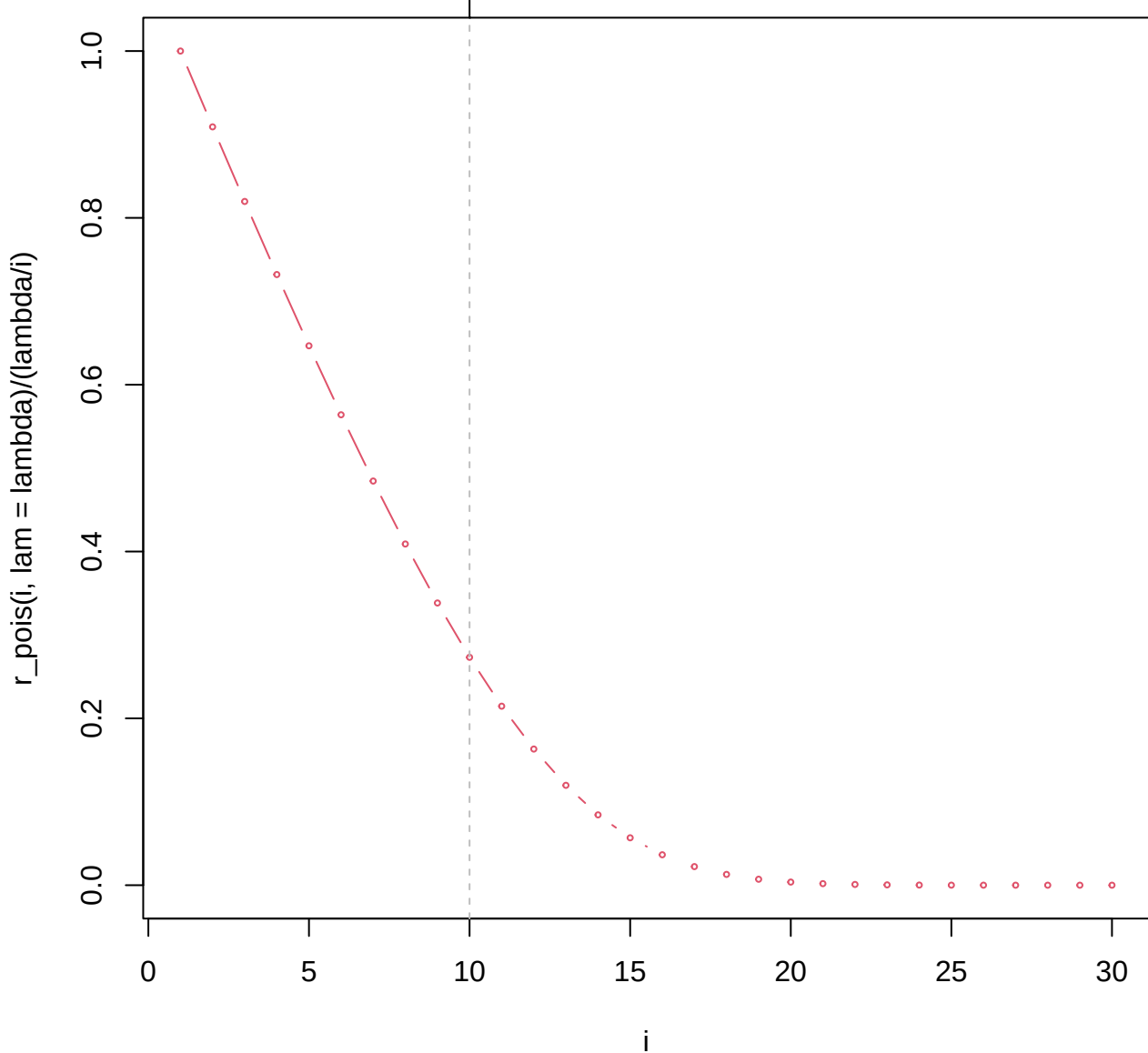
$$rr_{\lambda}(i) = \frac{\lambda^i / i!}{1 + \lambda + \lambda^2 / 2! + \dots + \lambda^{i-1} / (i-1)!}$$



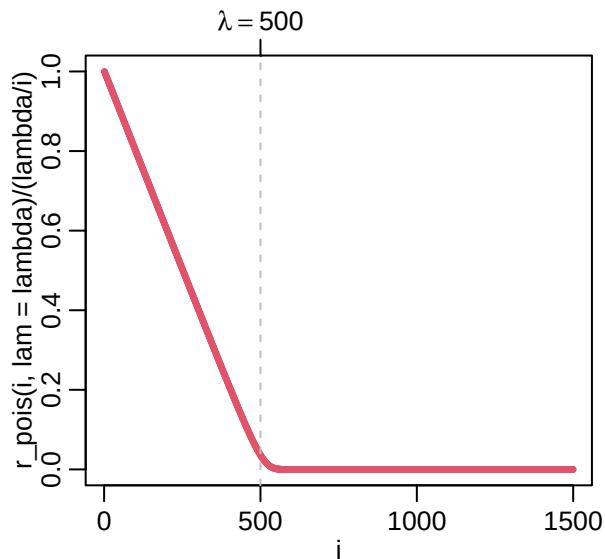
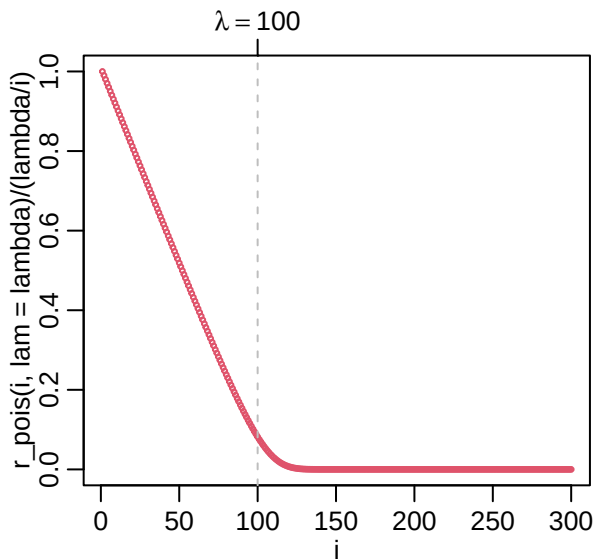
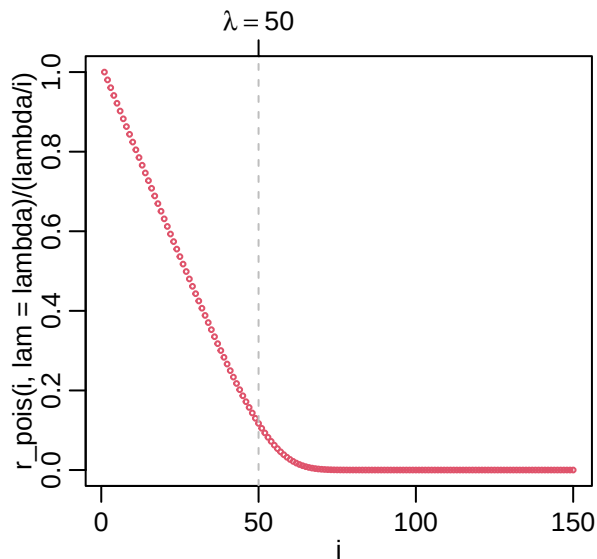
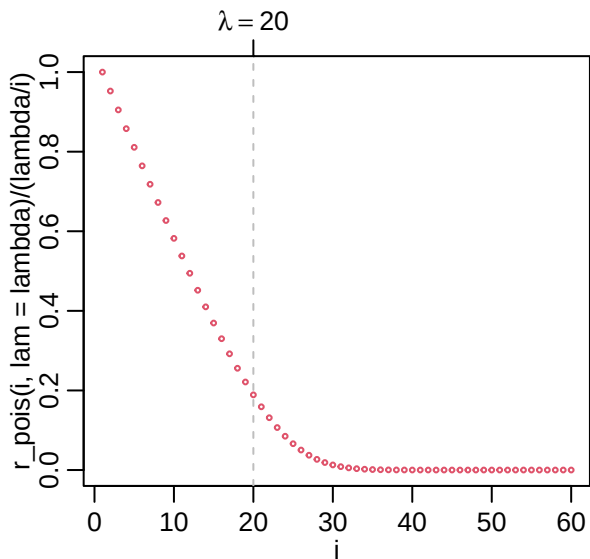
$$rr_{\lambda}(i) = \frac{\lambda^i / i!}{1 + \lambda + \lambda^2 / 2! + \dots + \lambda^{i-1} / (i-1)!}$$



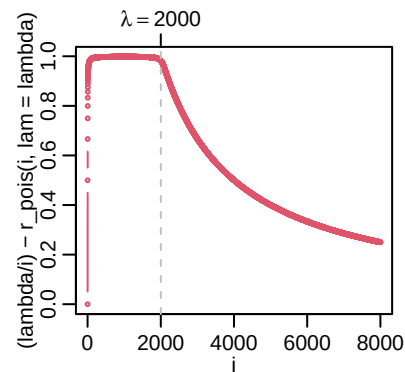
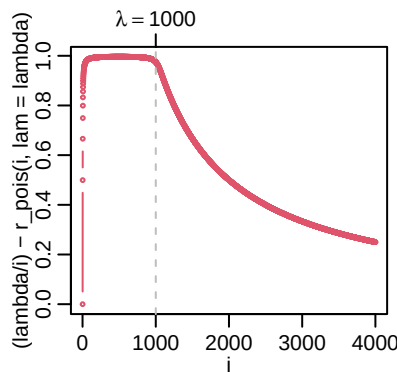
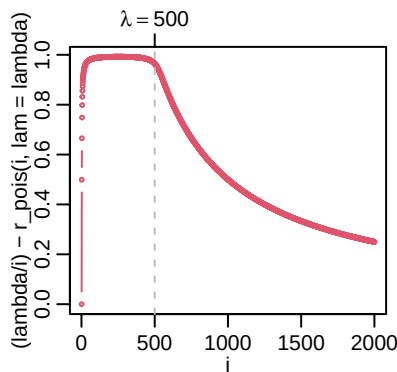
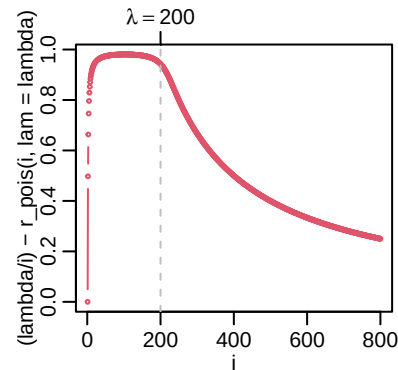
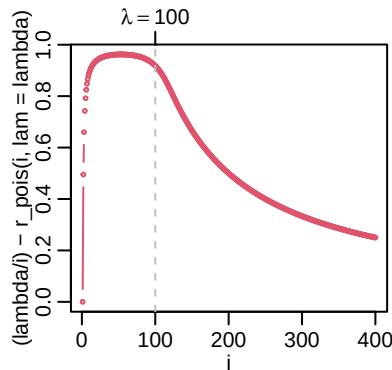
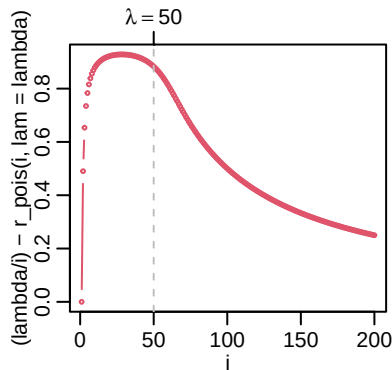
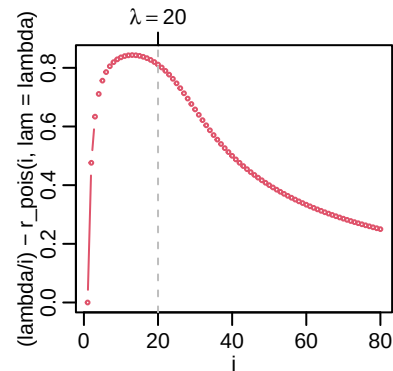
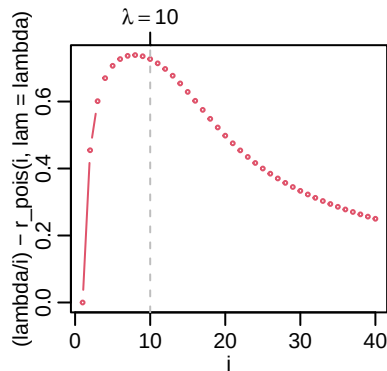
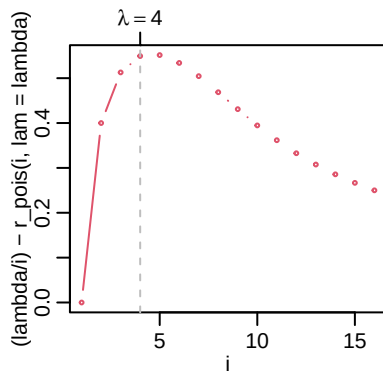
$\lambda = 10$

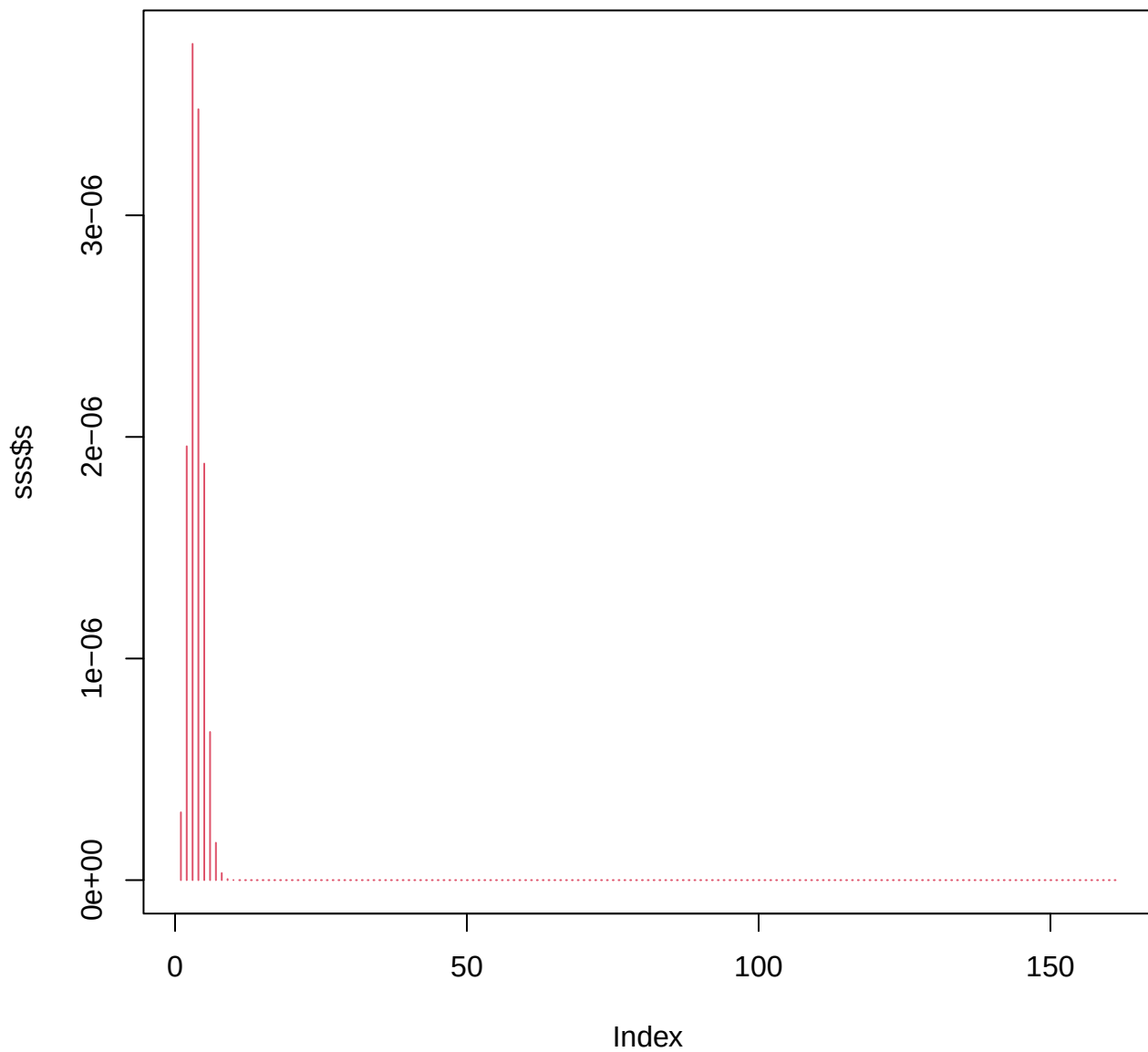


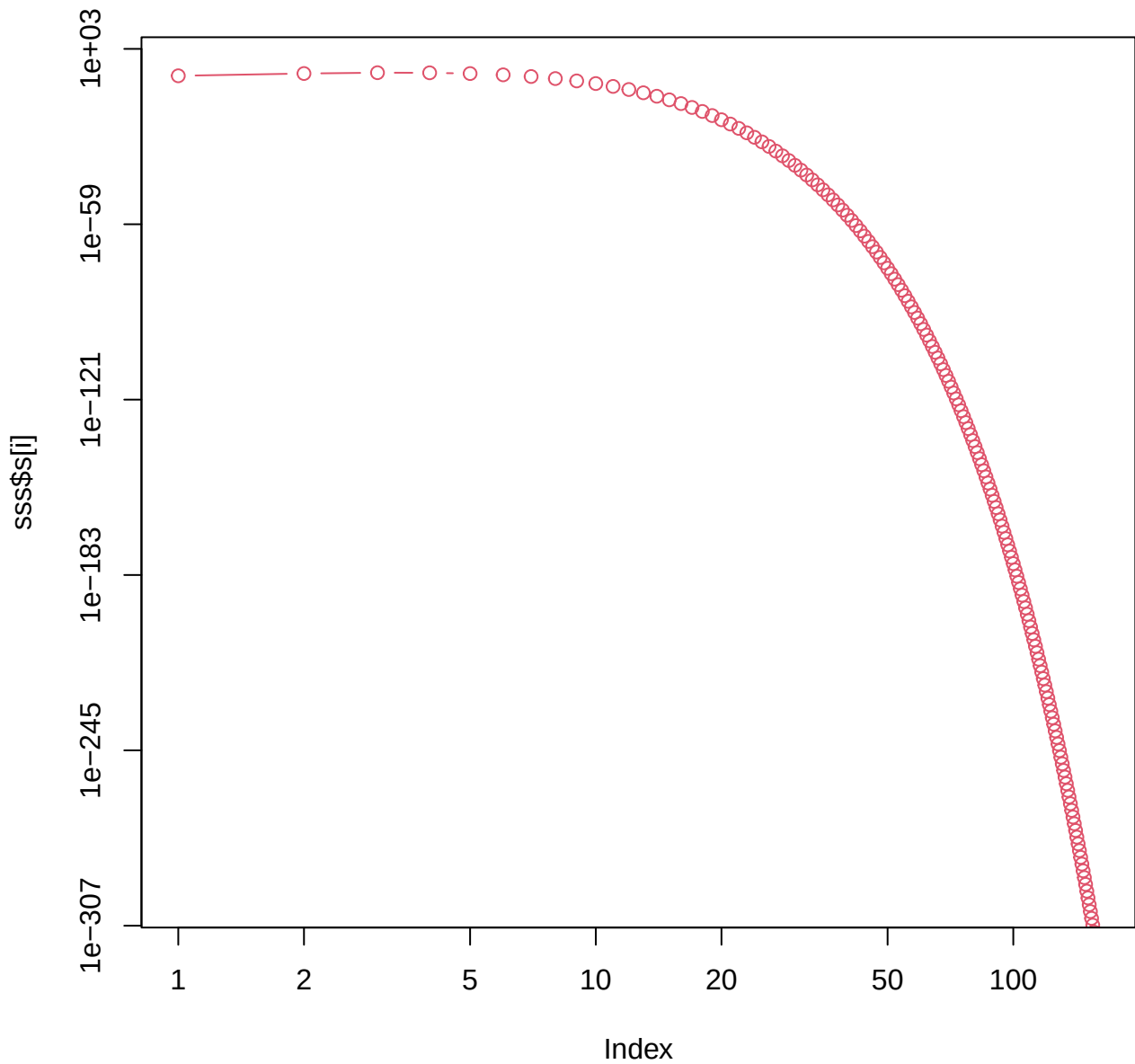
$$r_pois(i) / (\lambda / i)$$

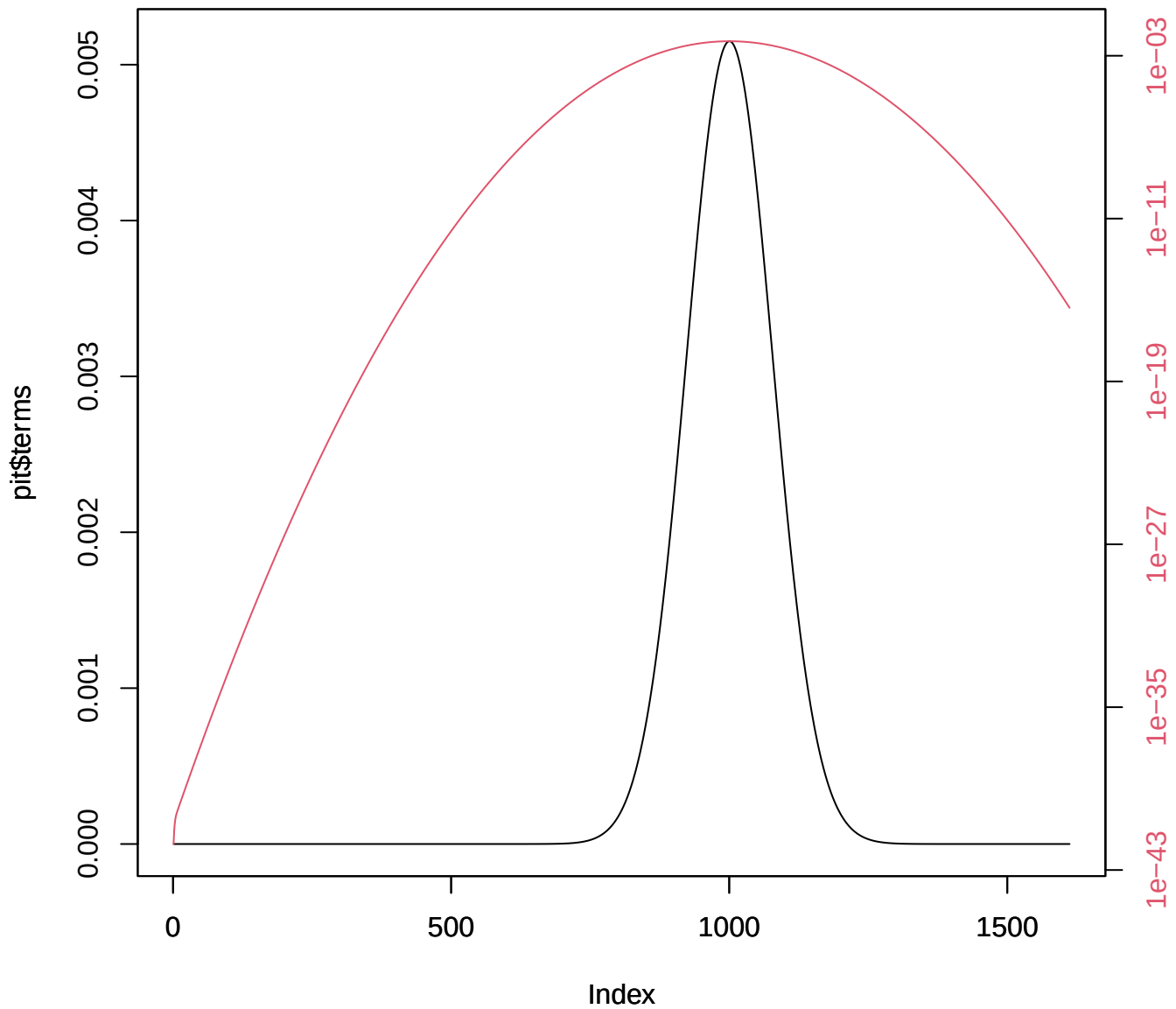


plotDr(λ)

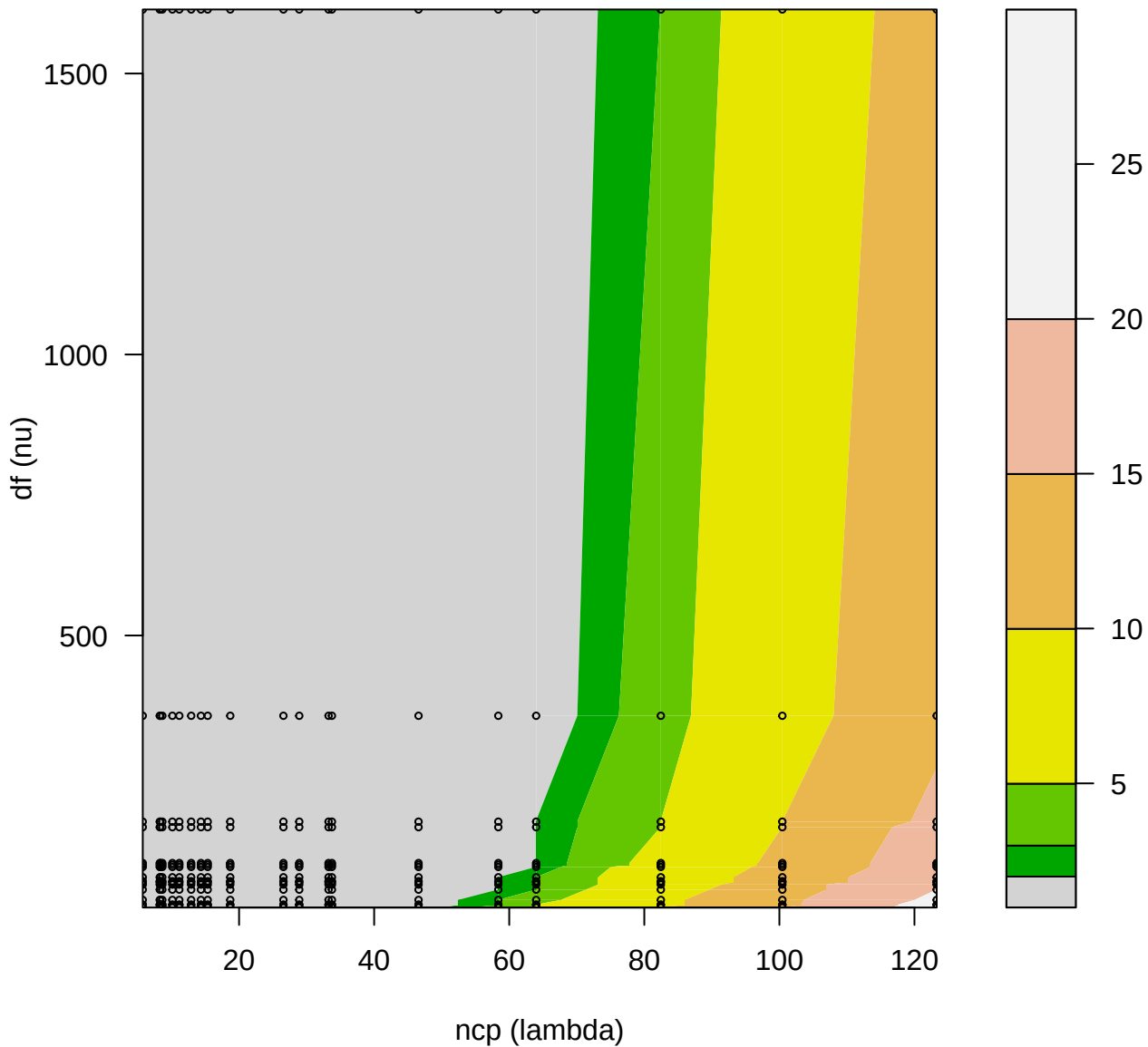




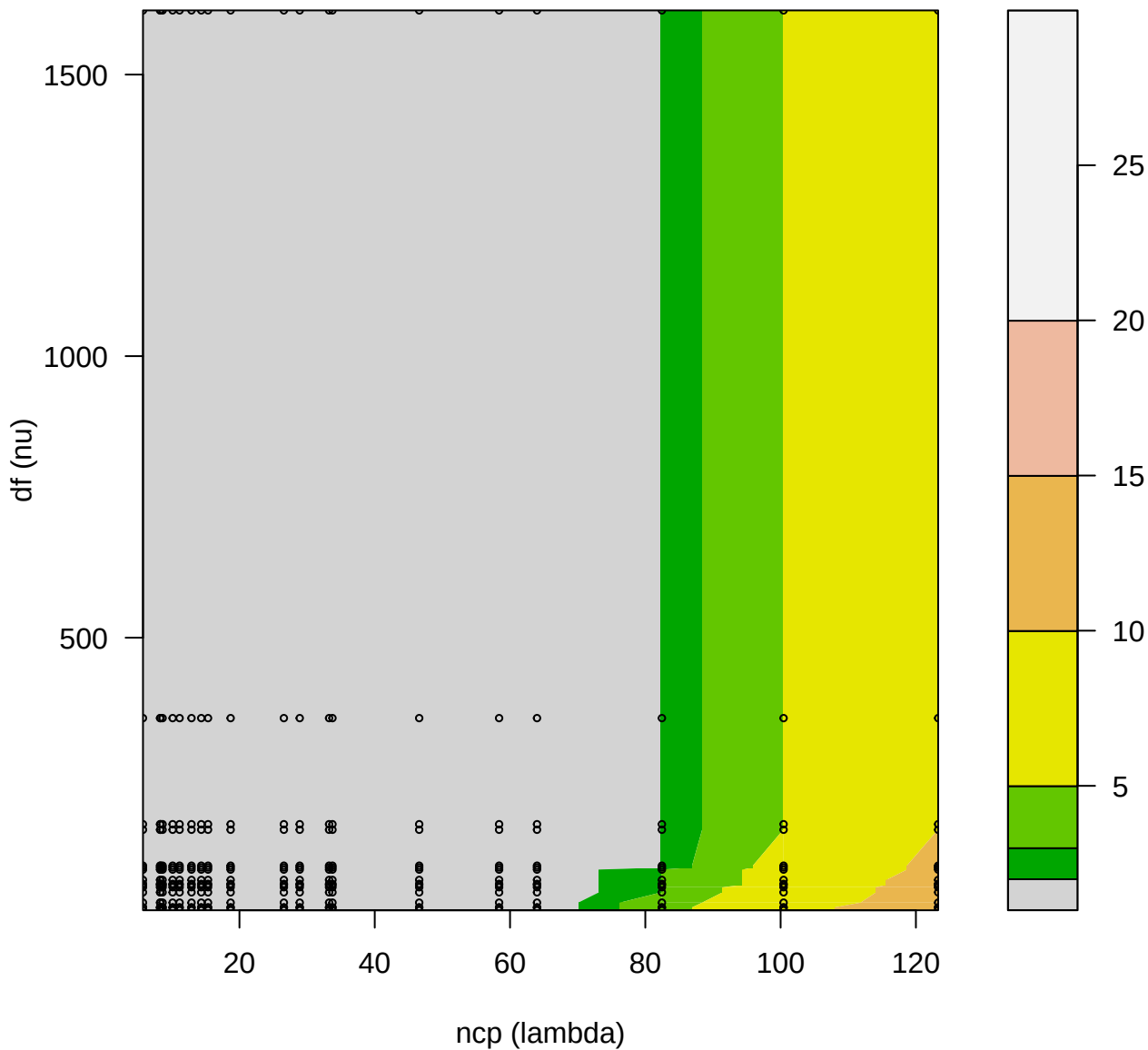




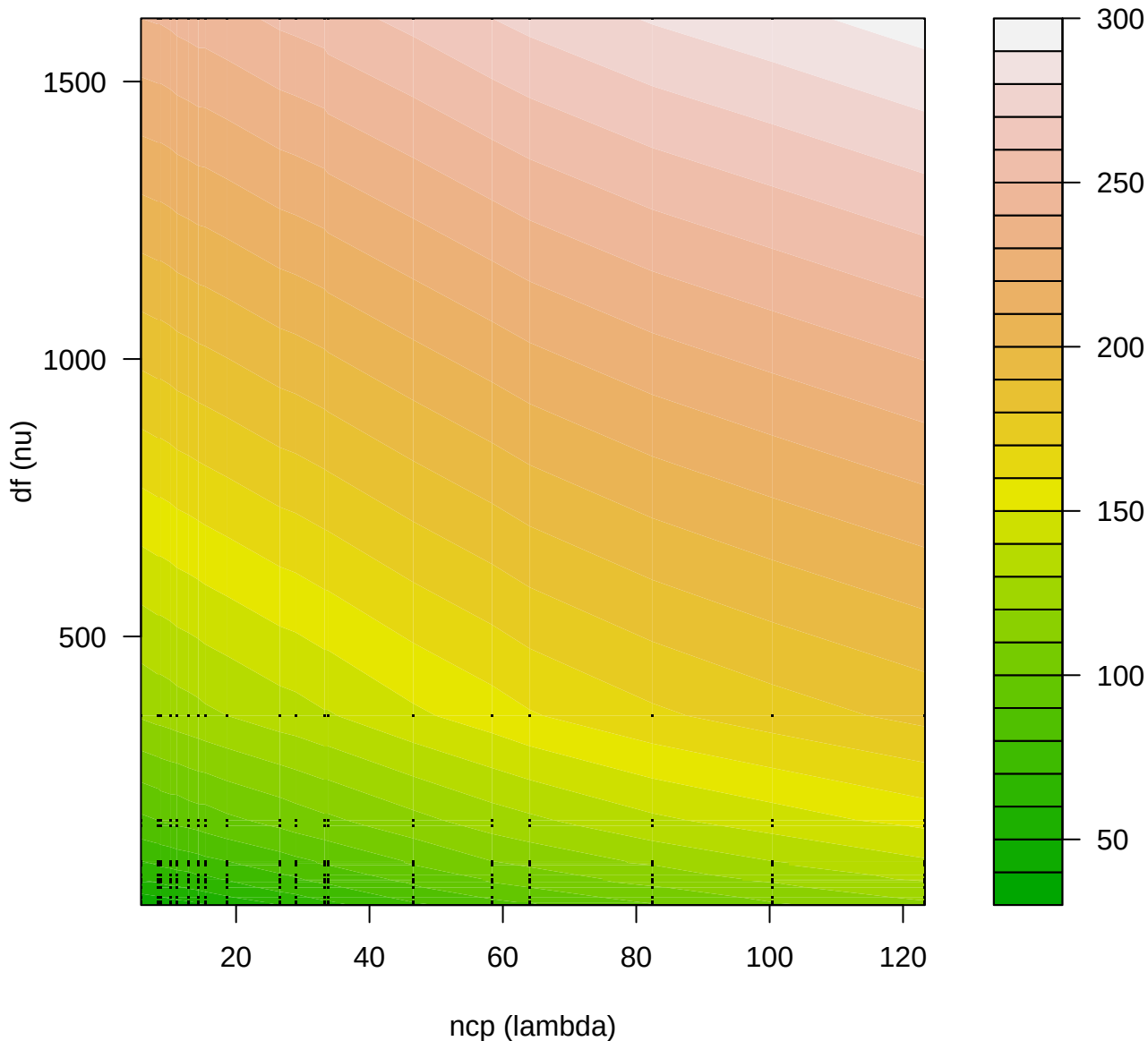
ssR[iN1 ,,, 6] (i.e., x=50%-perc.)



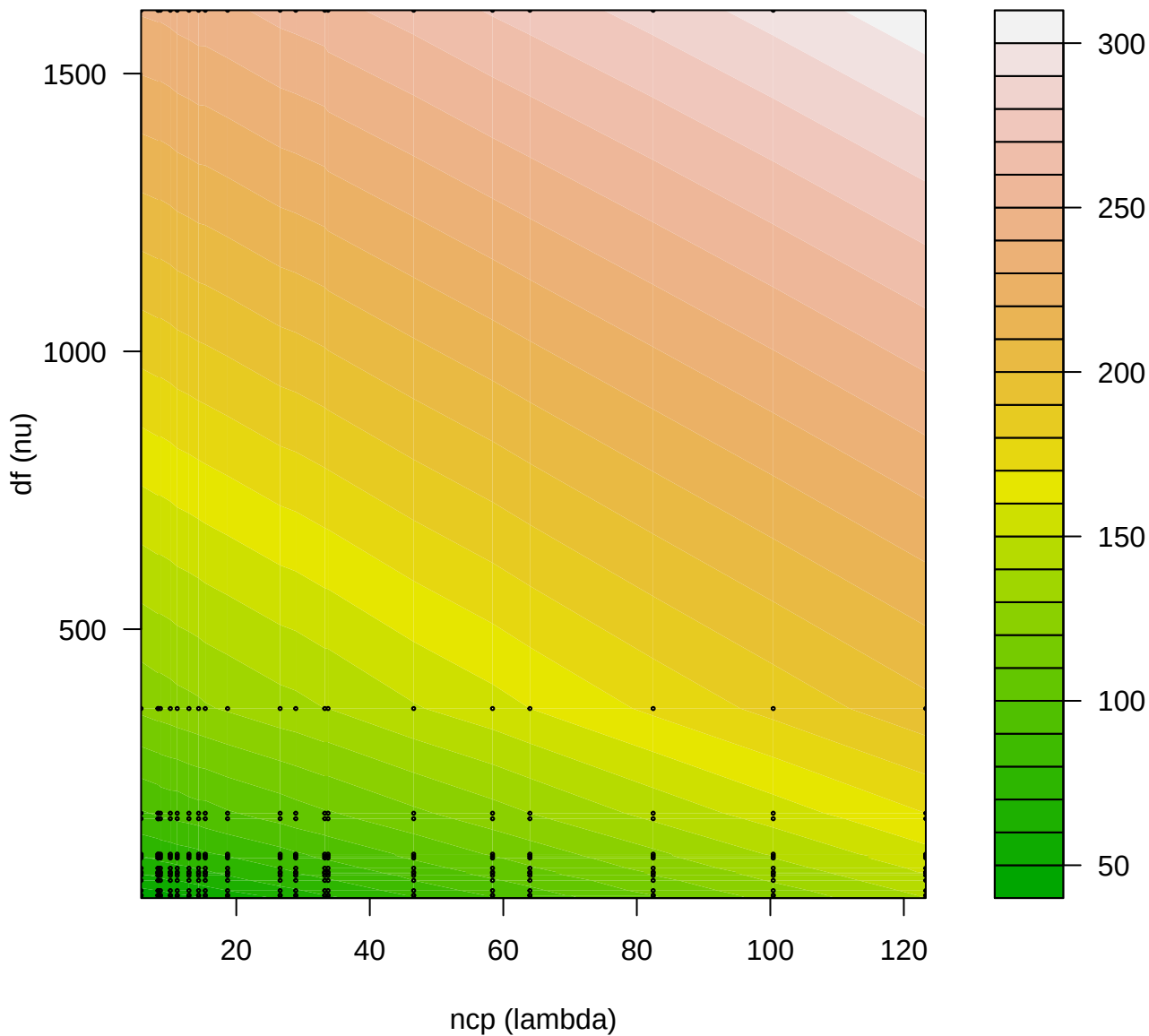
ssR[iN1,,, 1] (i.e., x=1%-perc.)



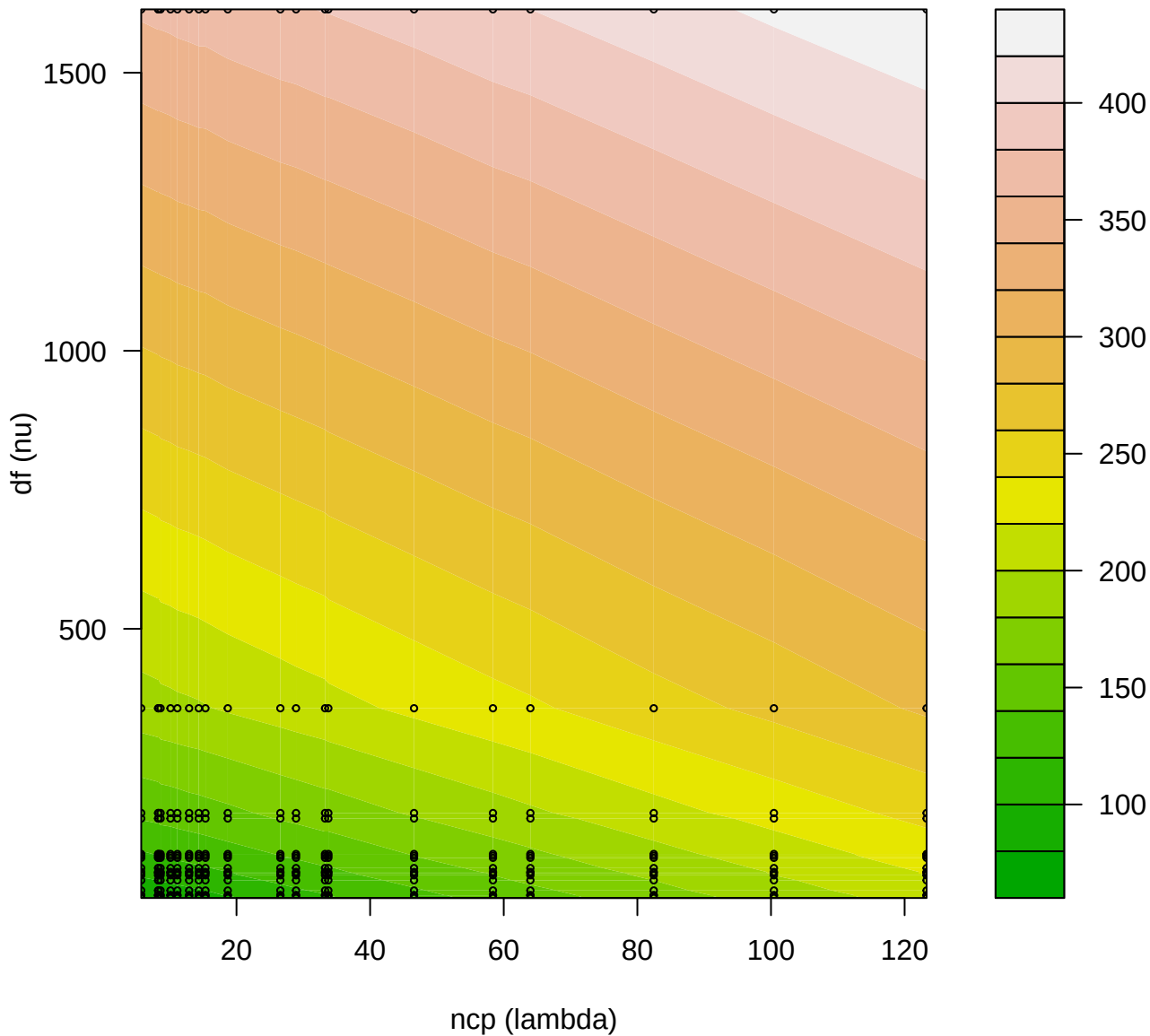
Spread ssR['iN2 - iN1' ,,, 6] (i.e., x=50%-perc.)

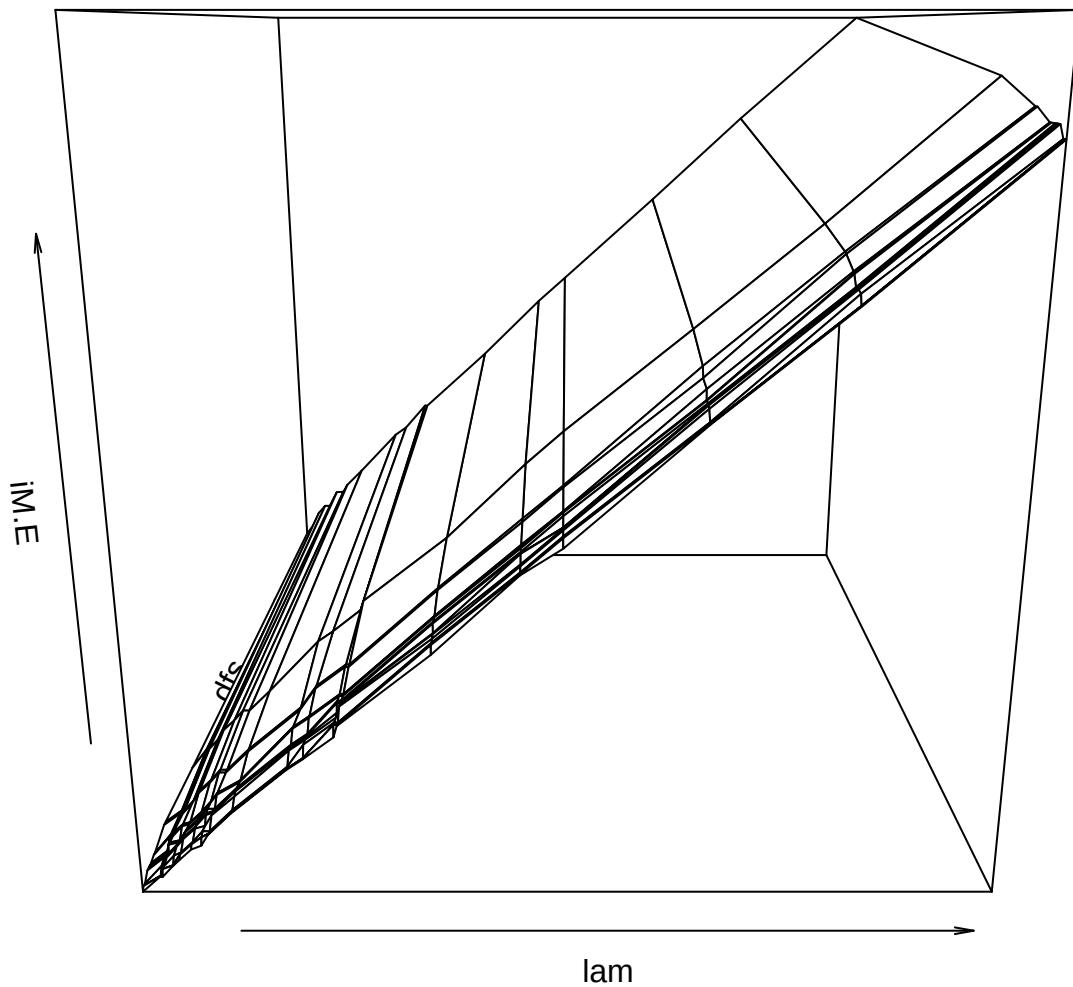


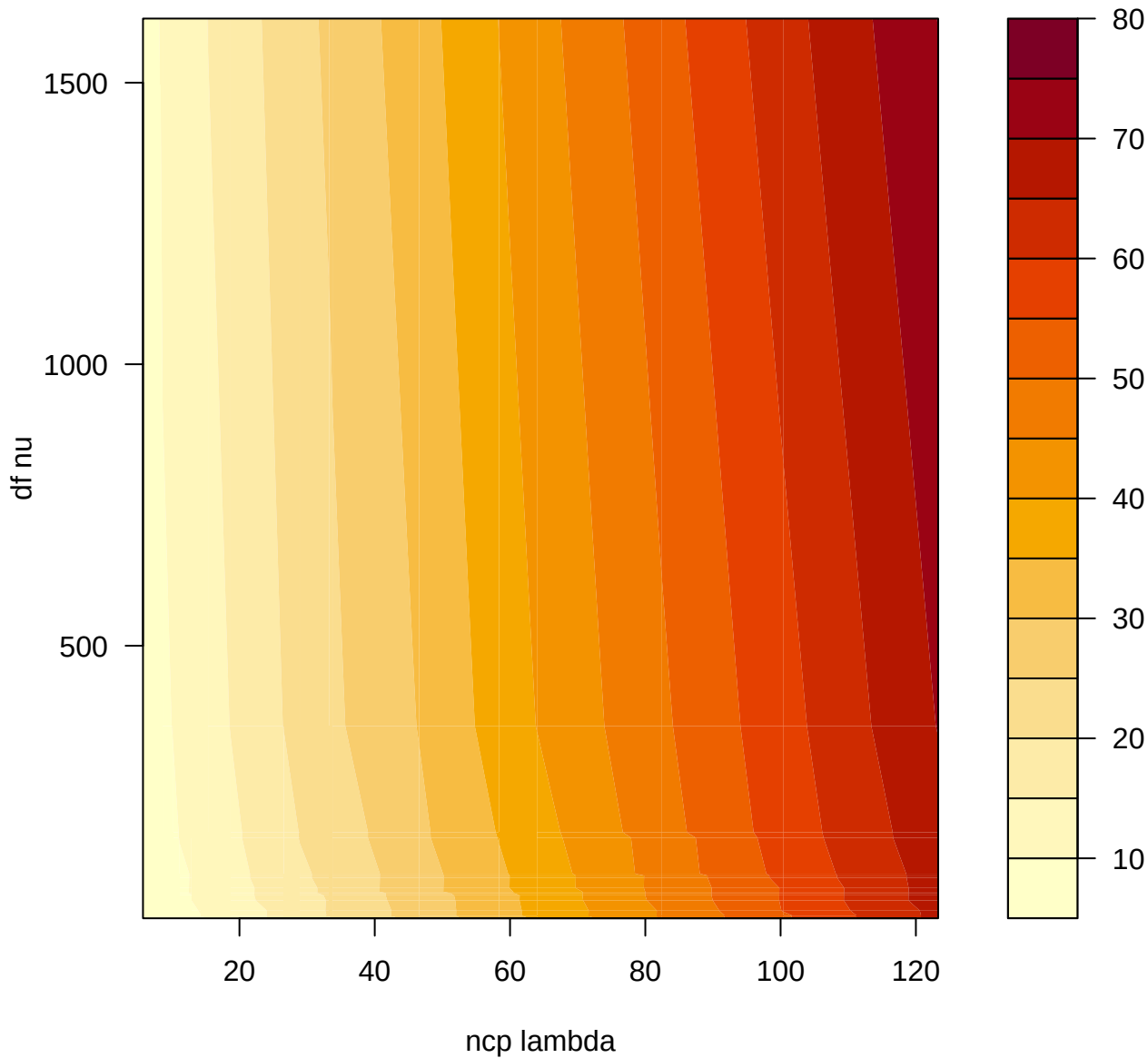
ssR[iN2 ,,, 6] (i.e., x=50%-perc.)



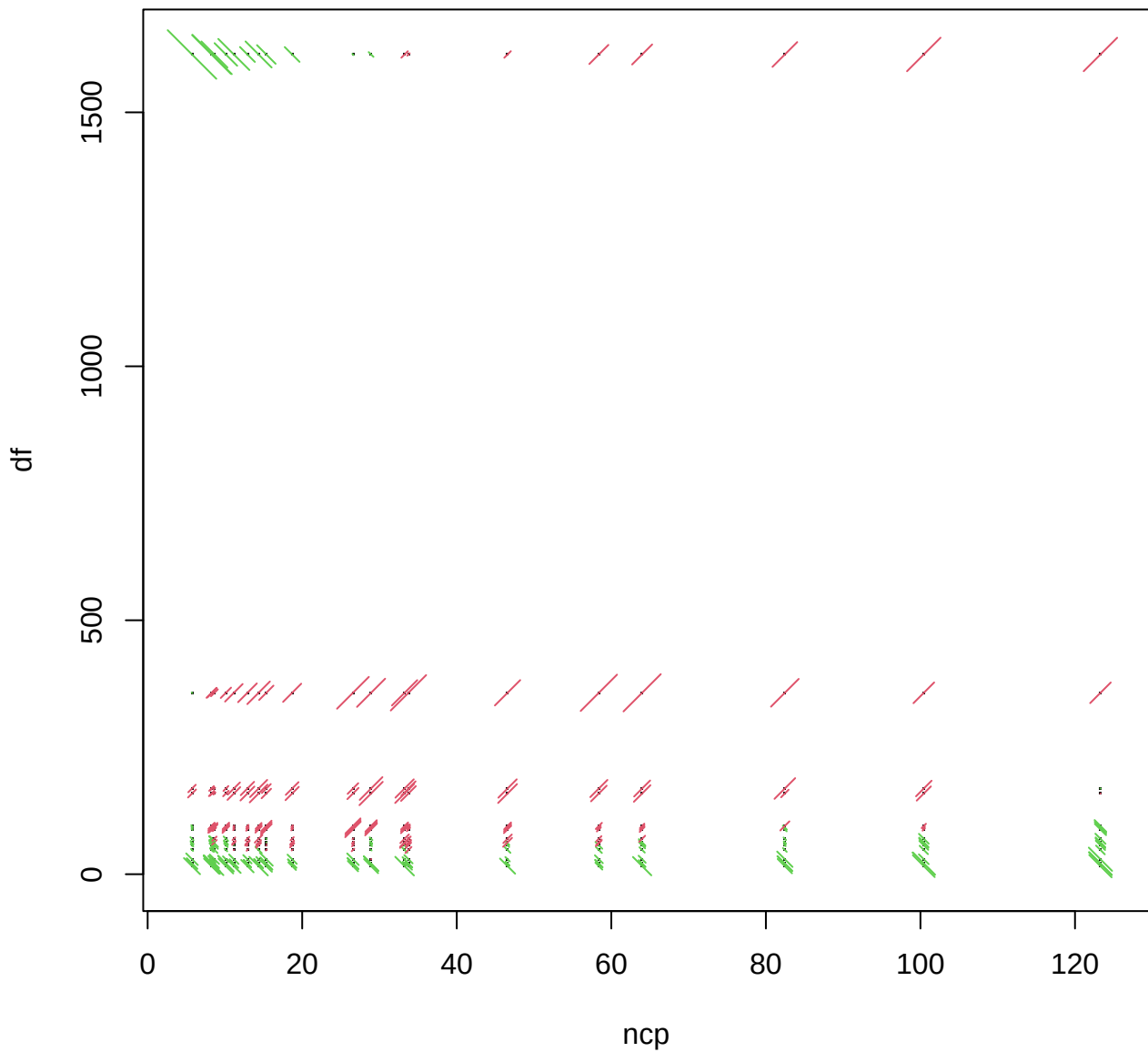
ssR[iN2 ,, 12] (i.e., x=99.99%-perc.)

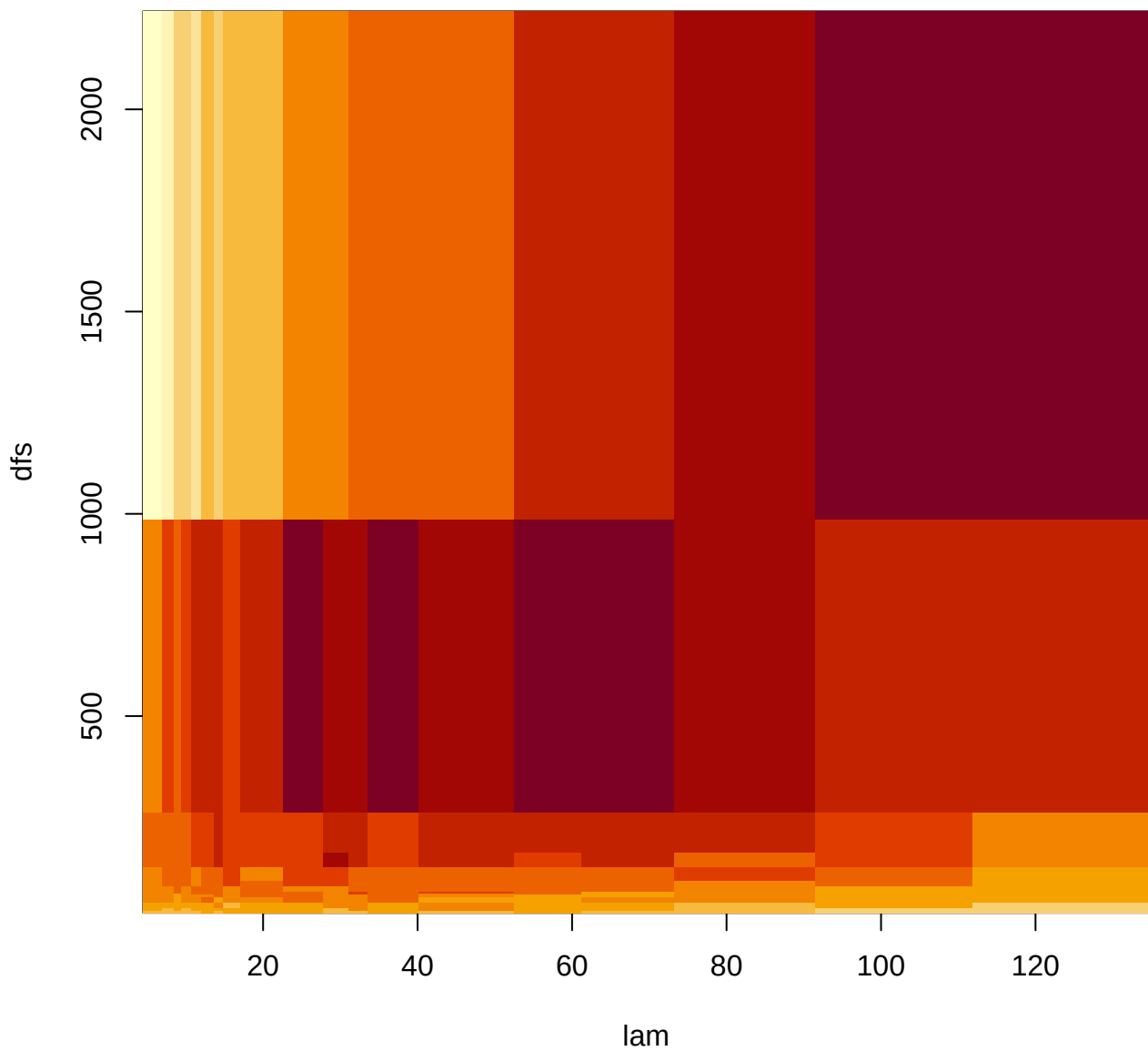




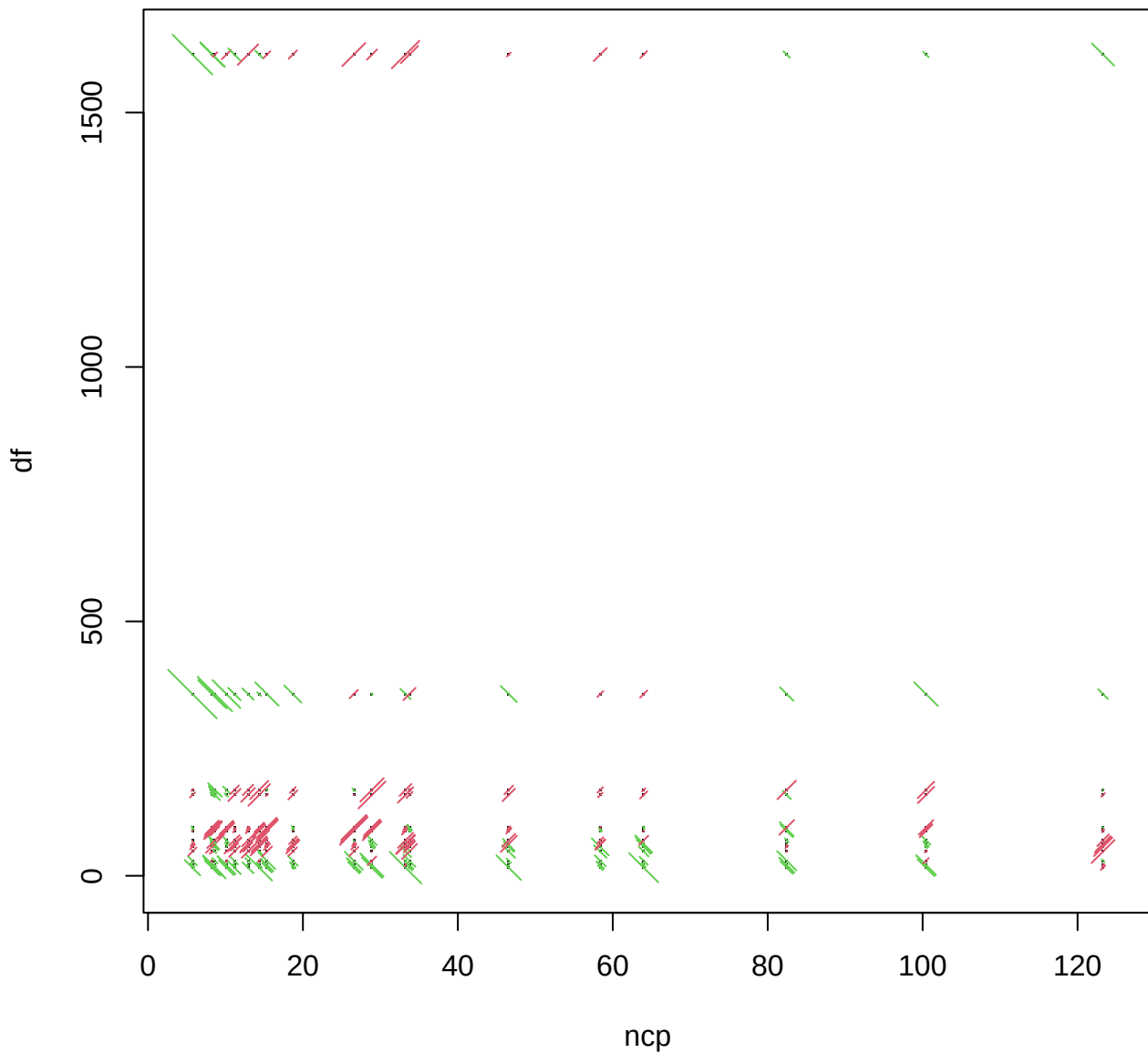


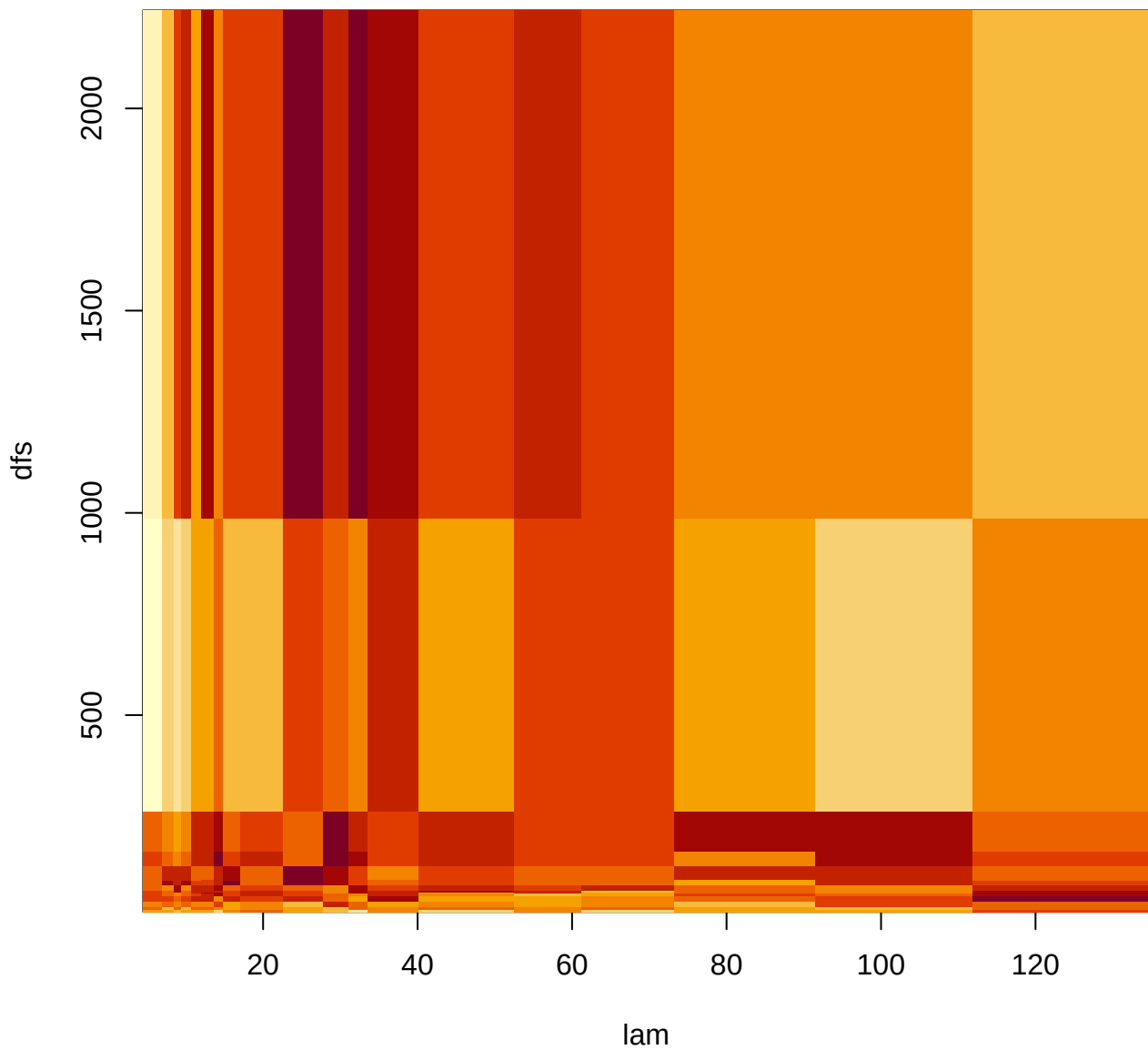
residuals(lm1)

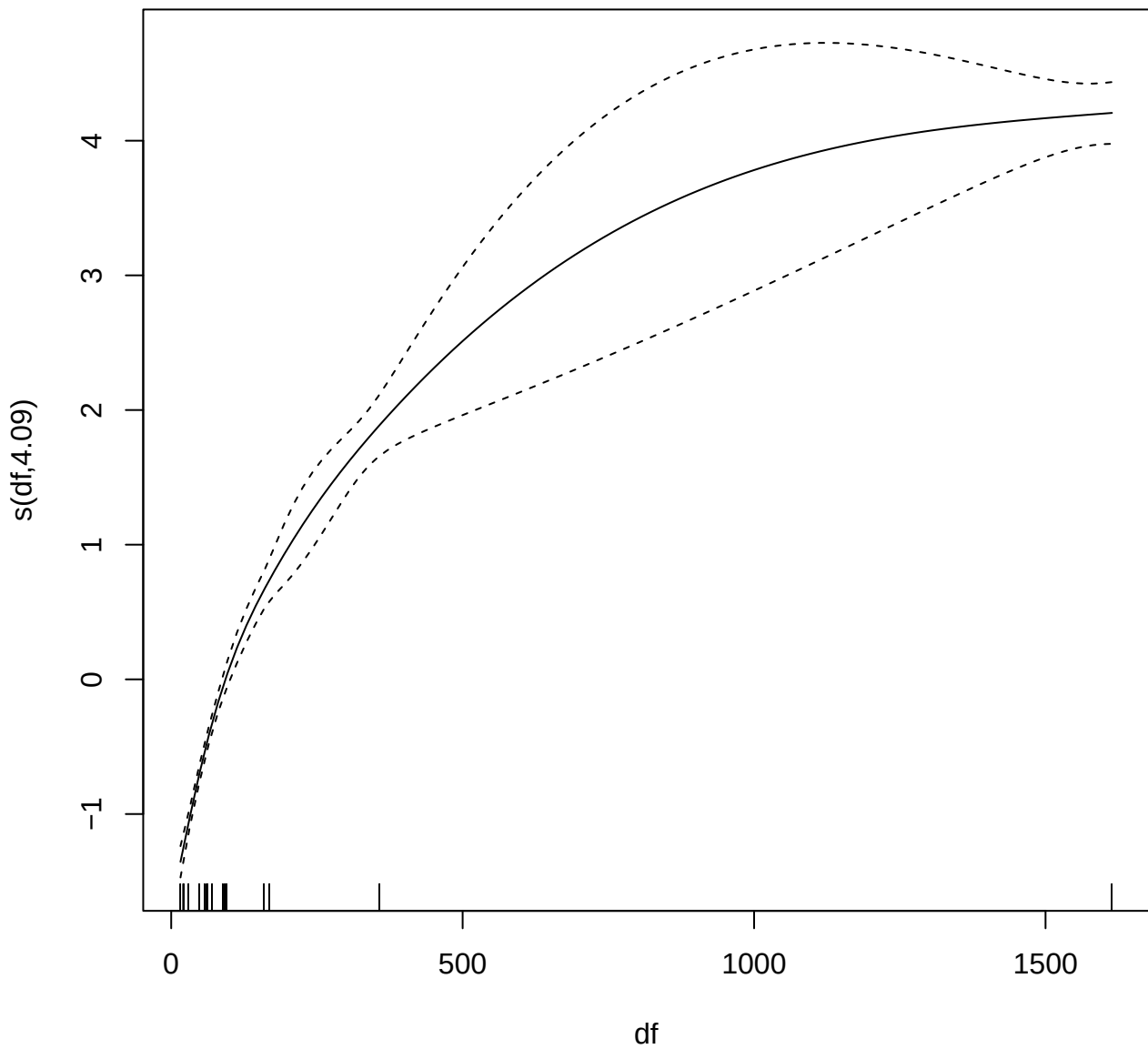




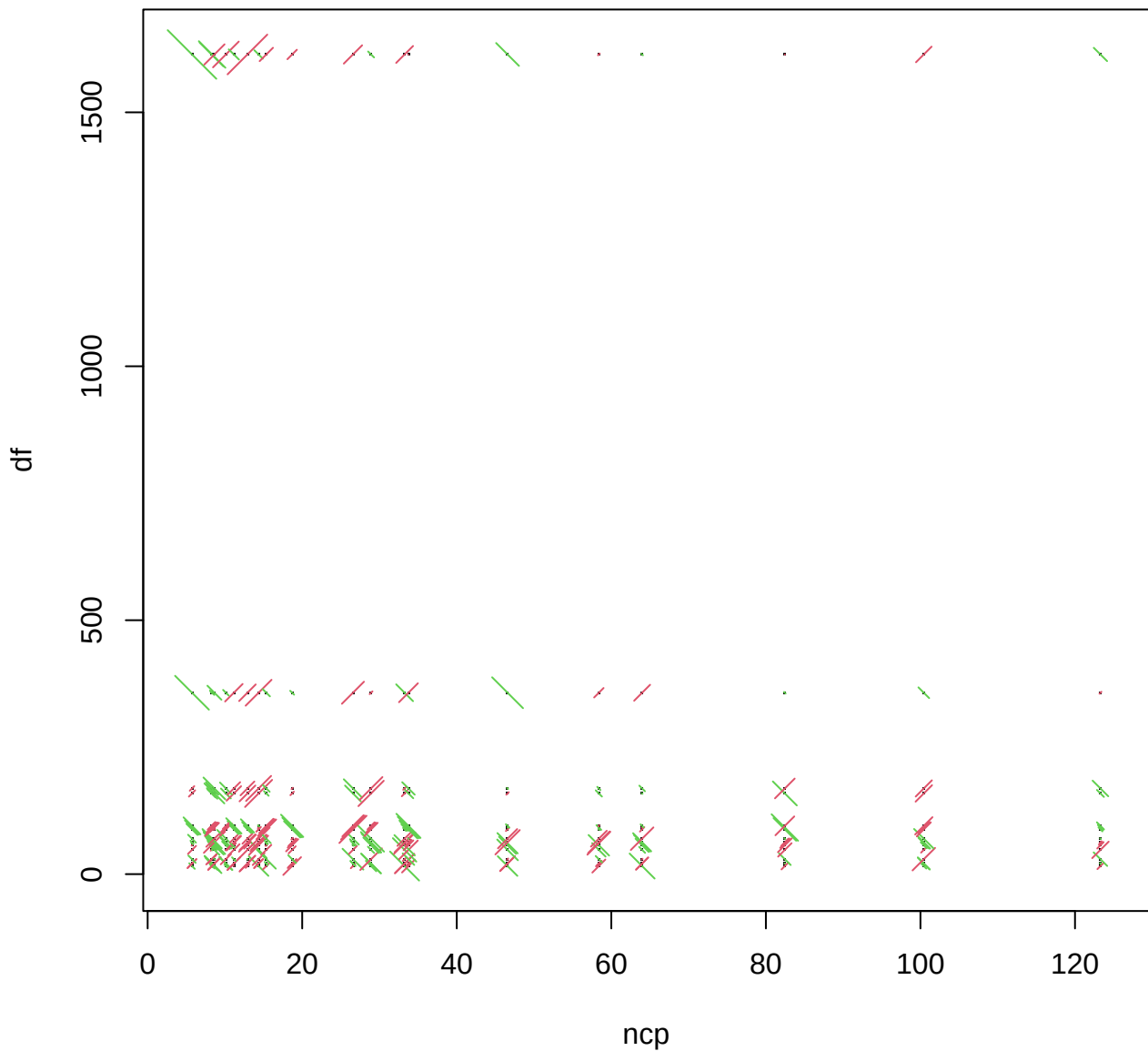
residuals(lm3)

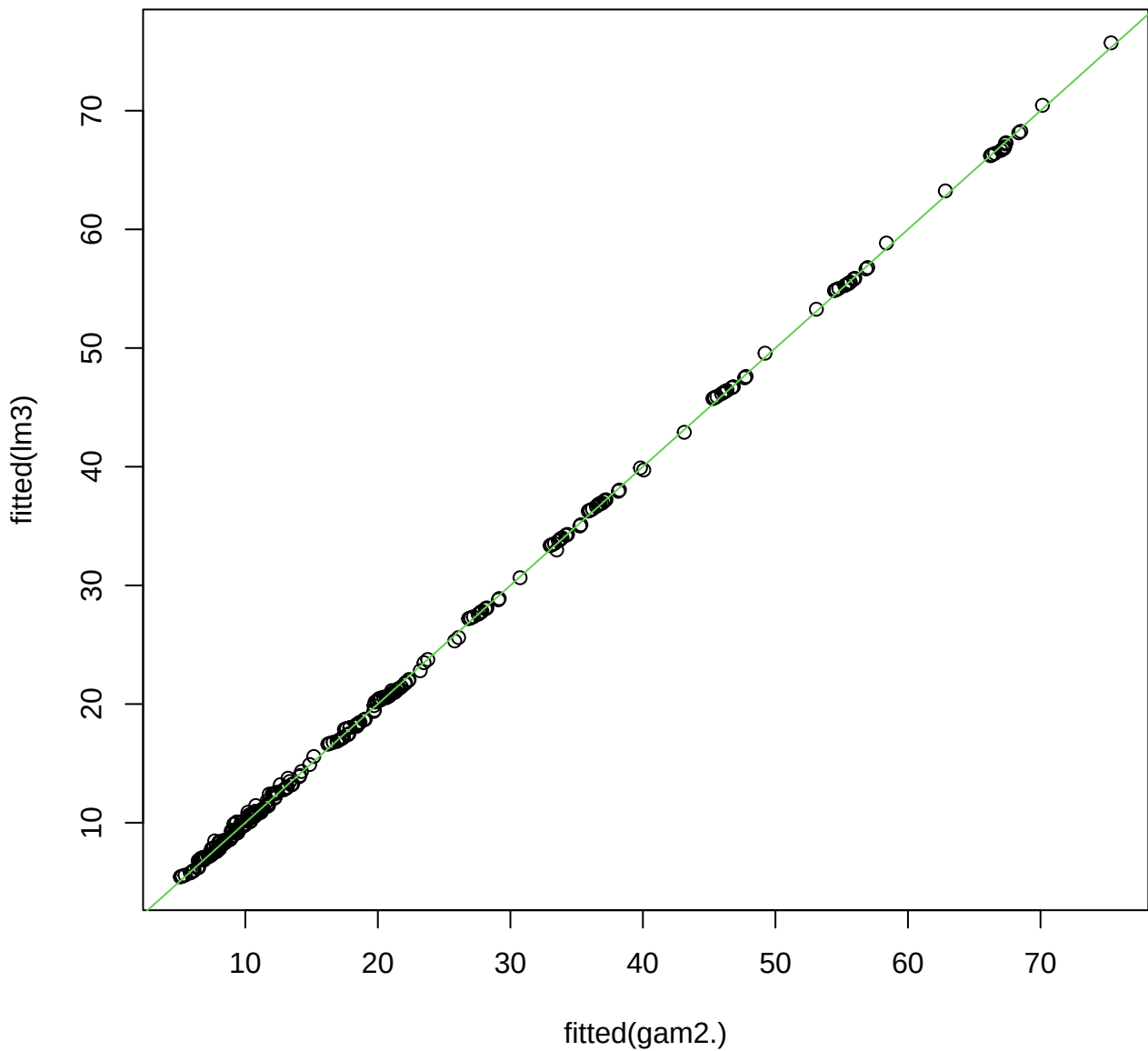


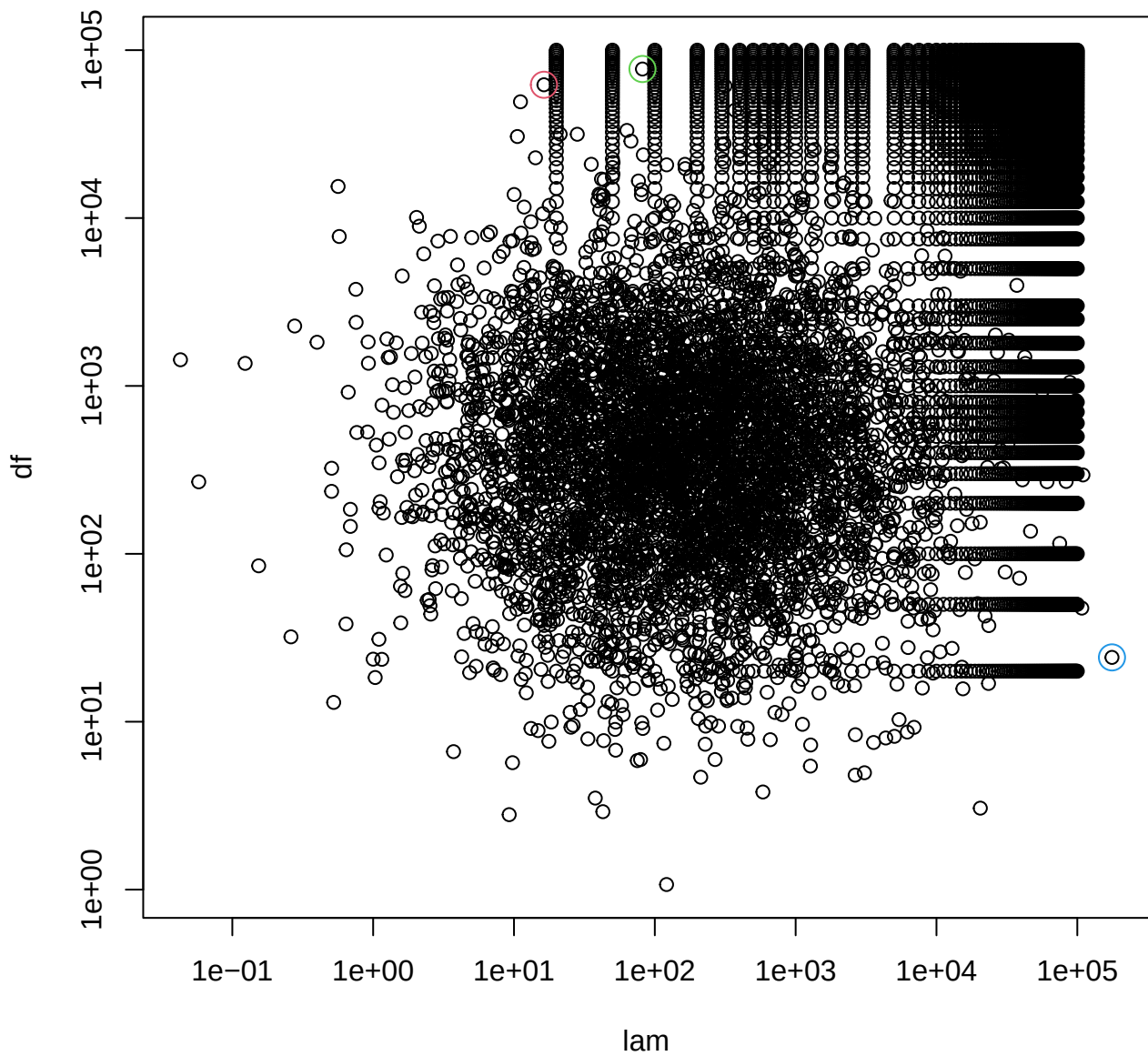


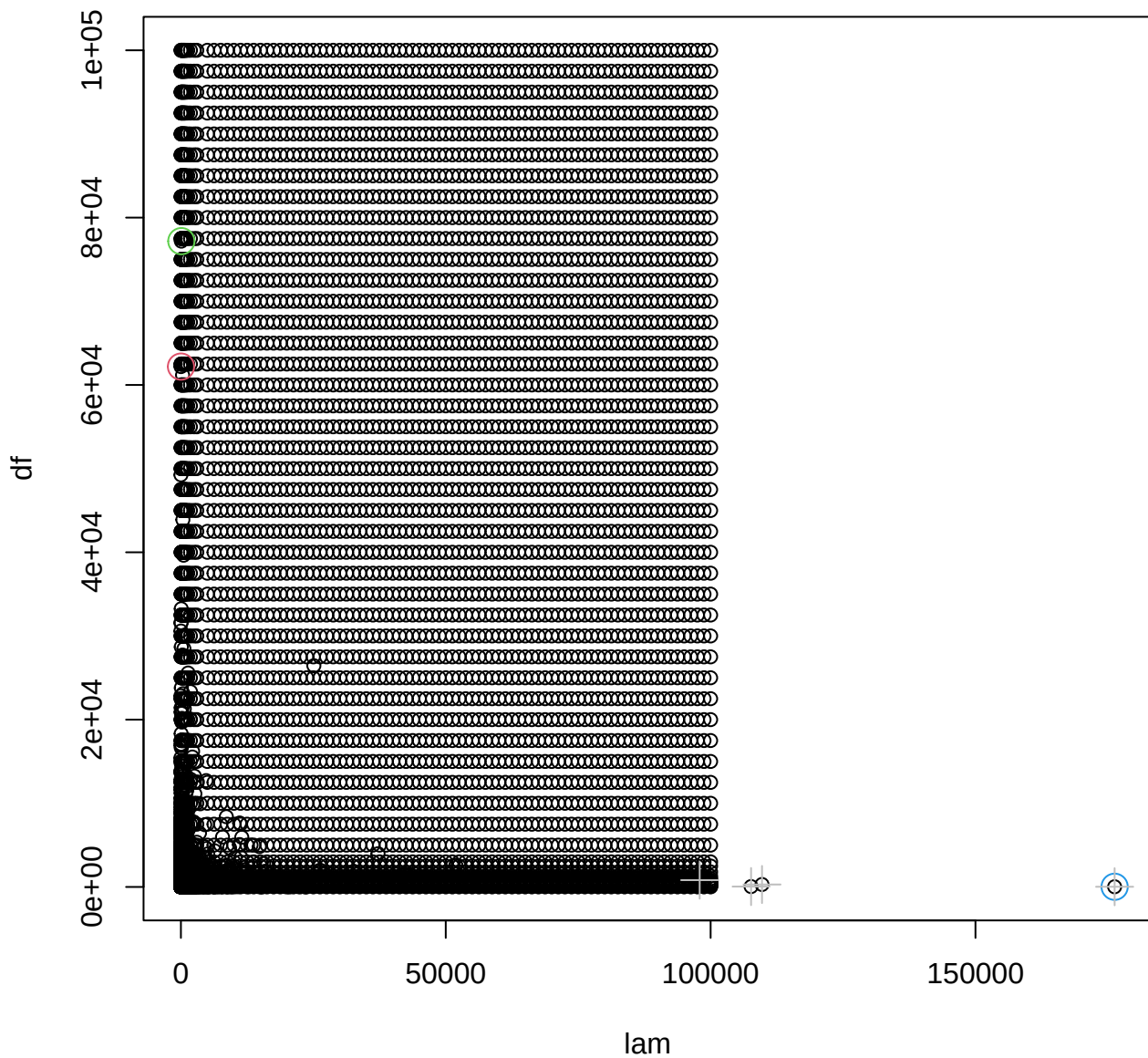


residuals(gam2.)

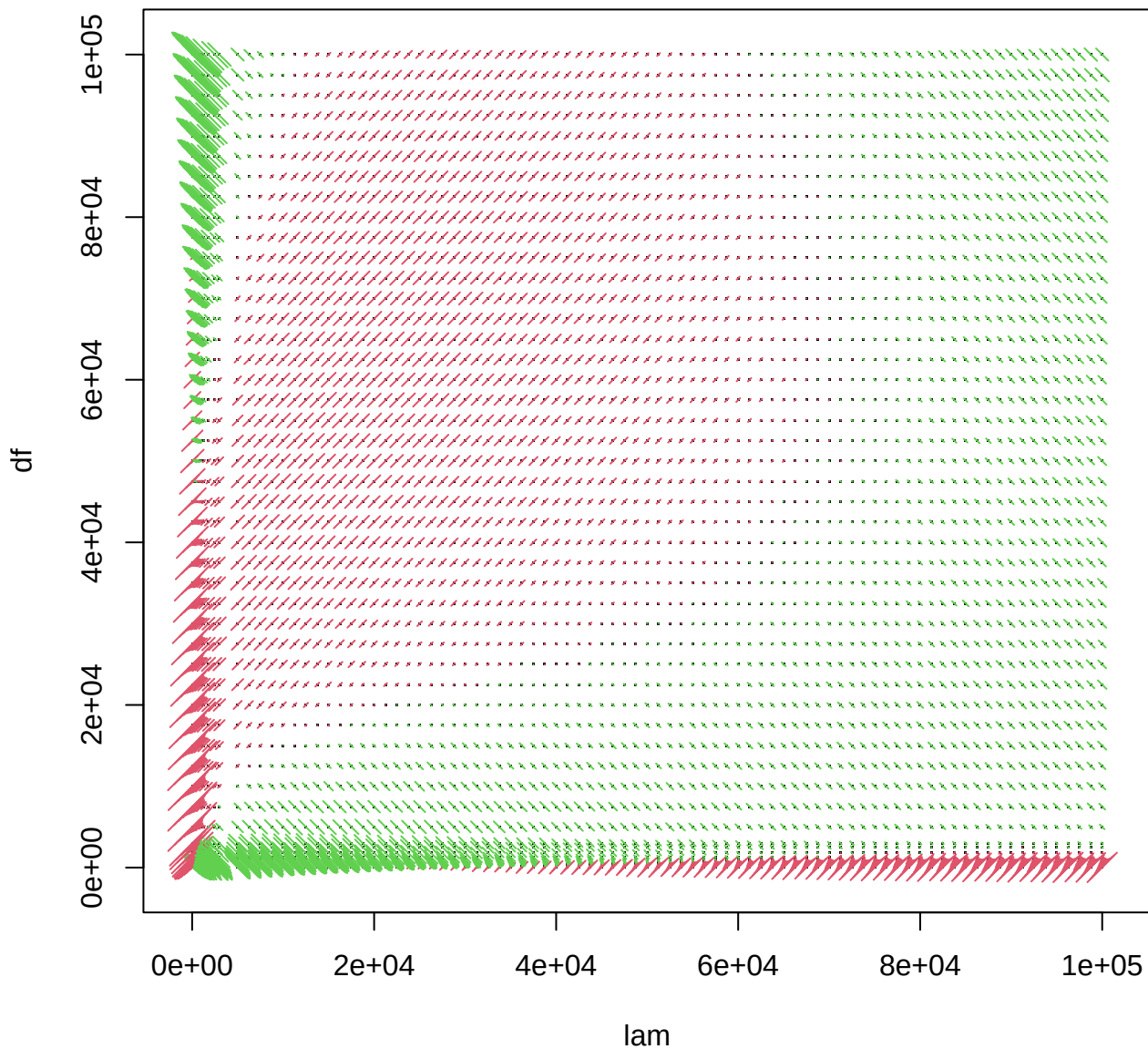




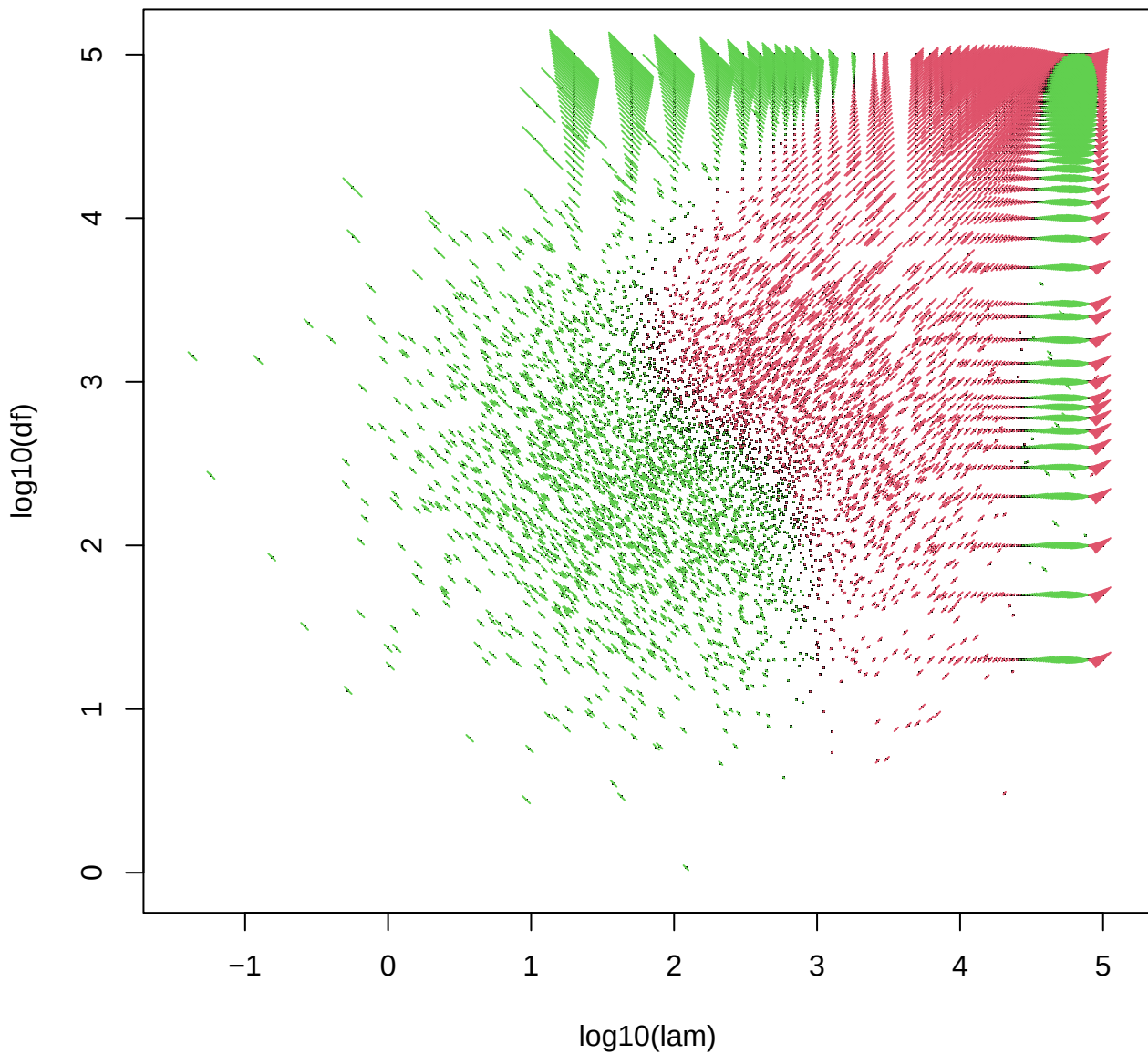




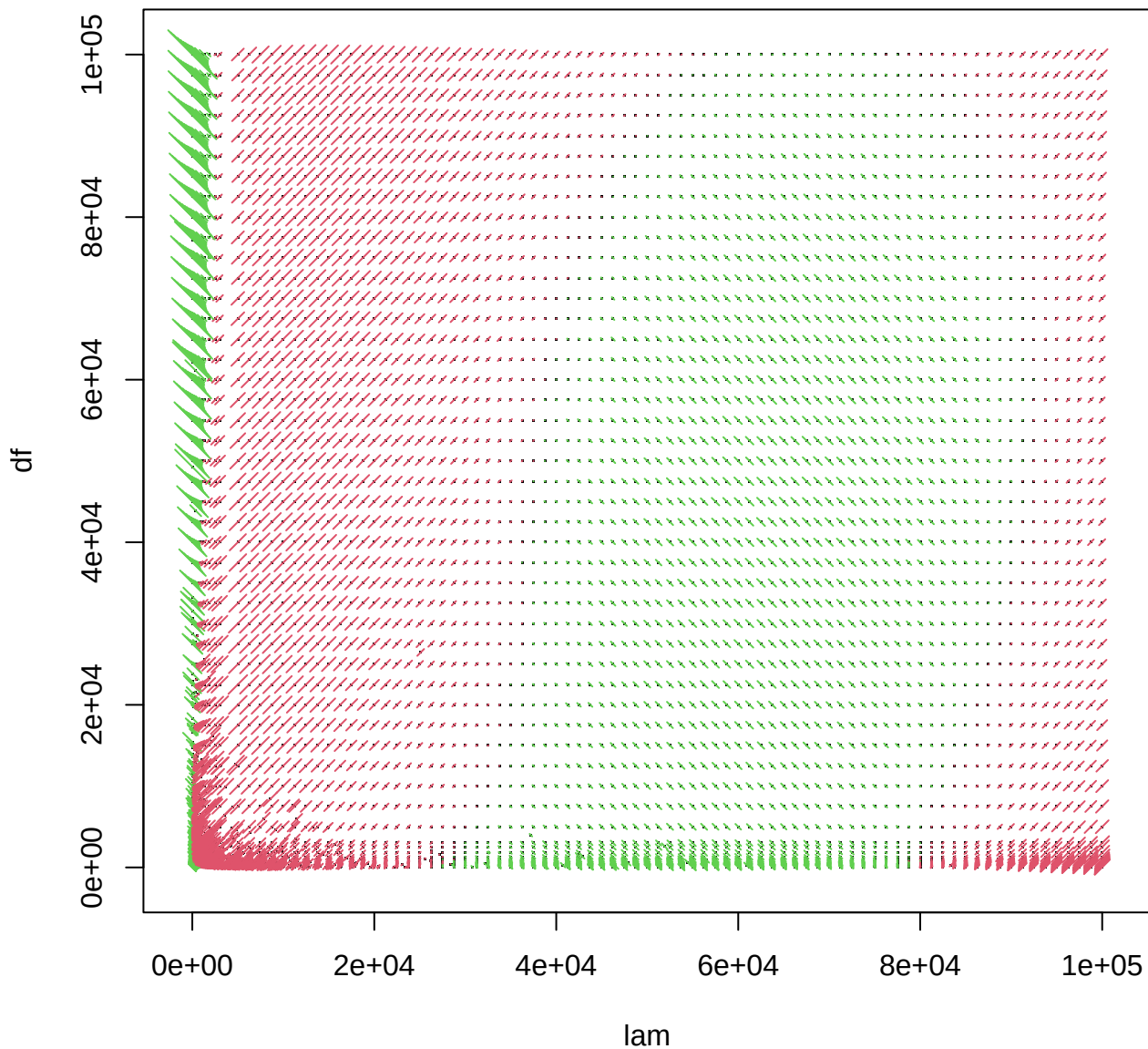
residuals(l.15)



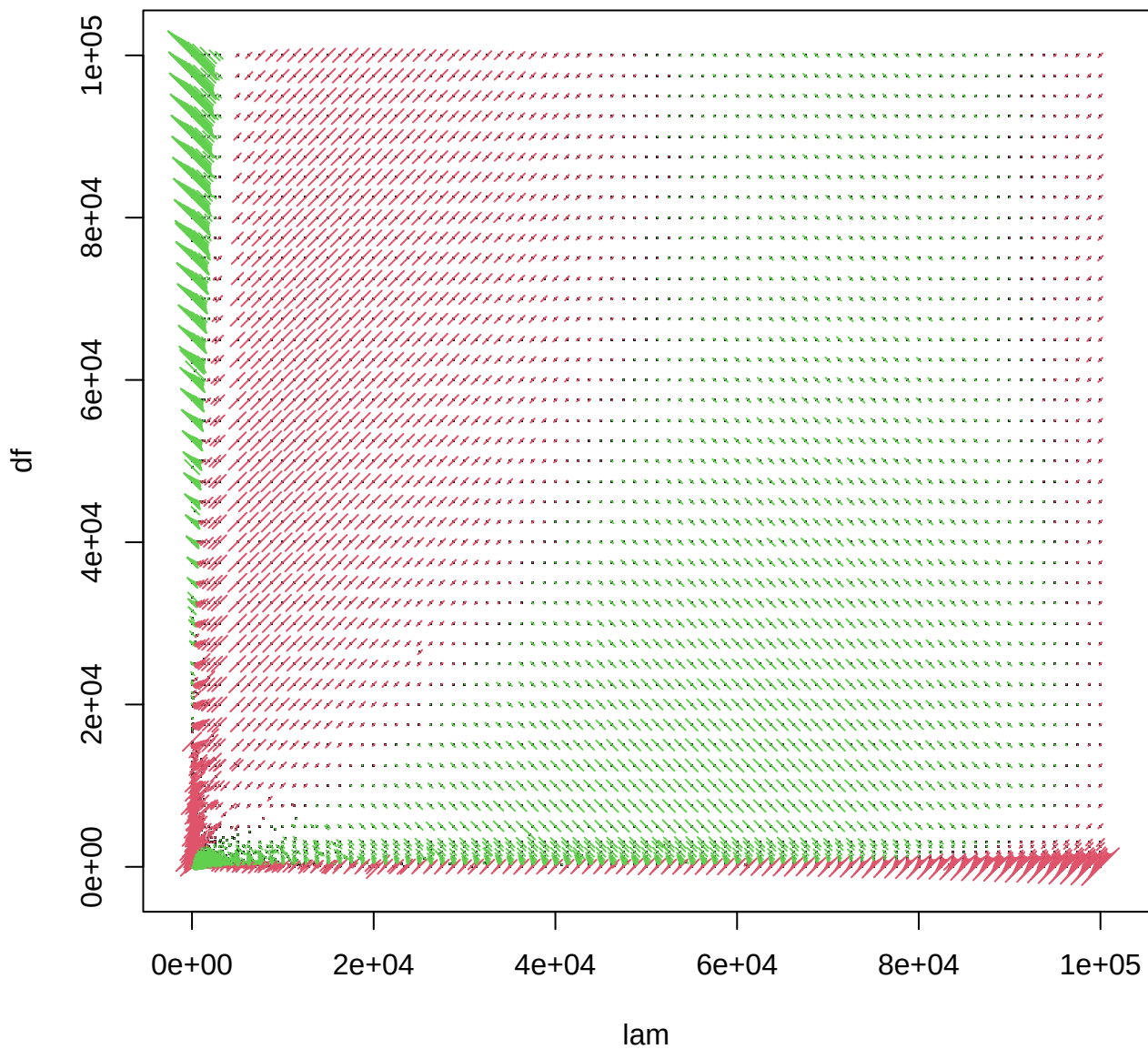
residuals(l.5)



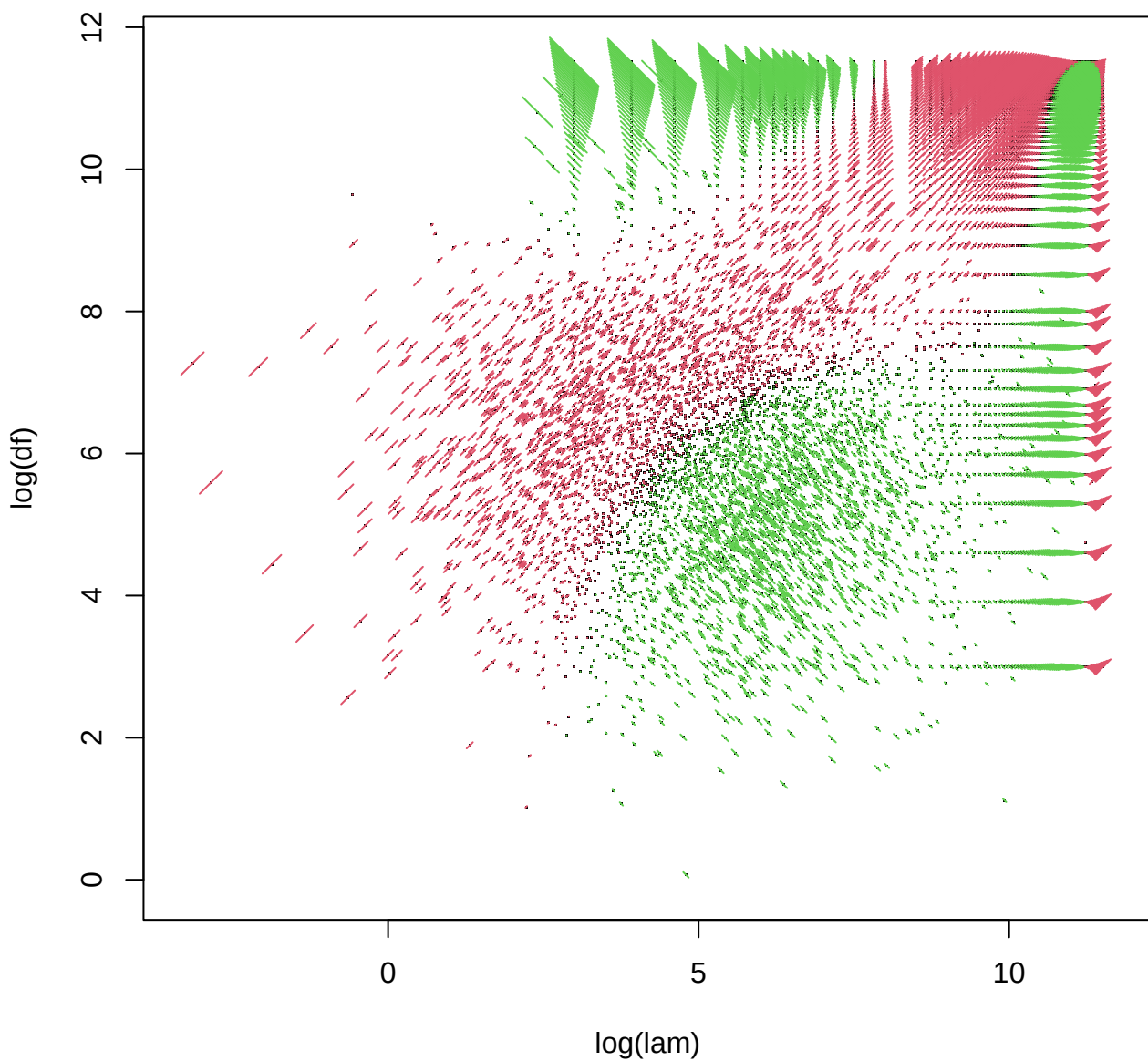
residuals(l.5)



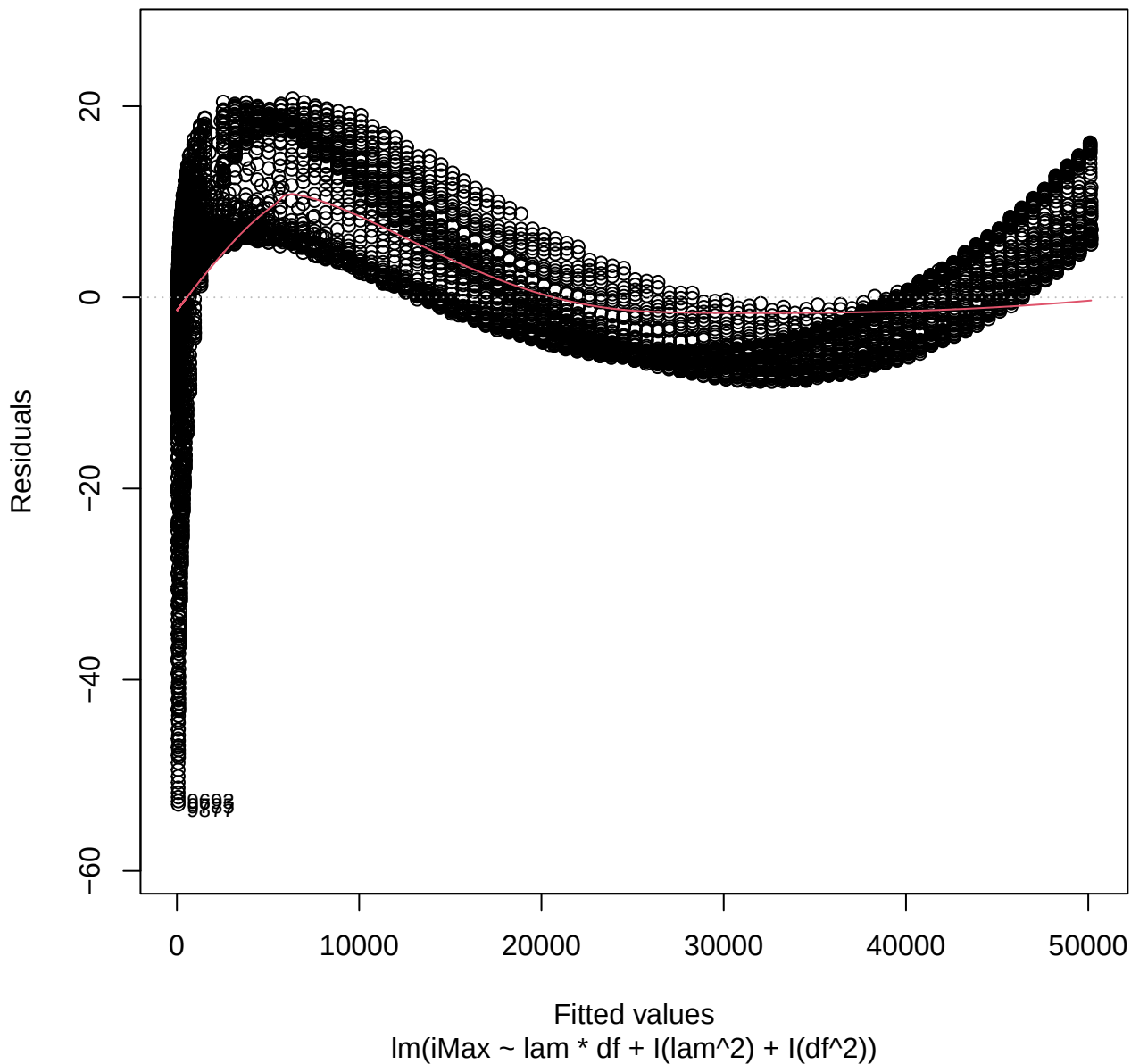
residuals(l.10)

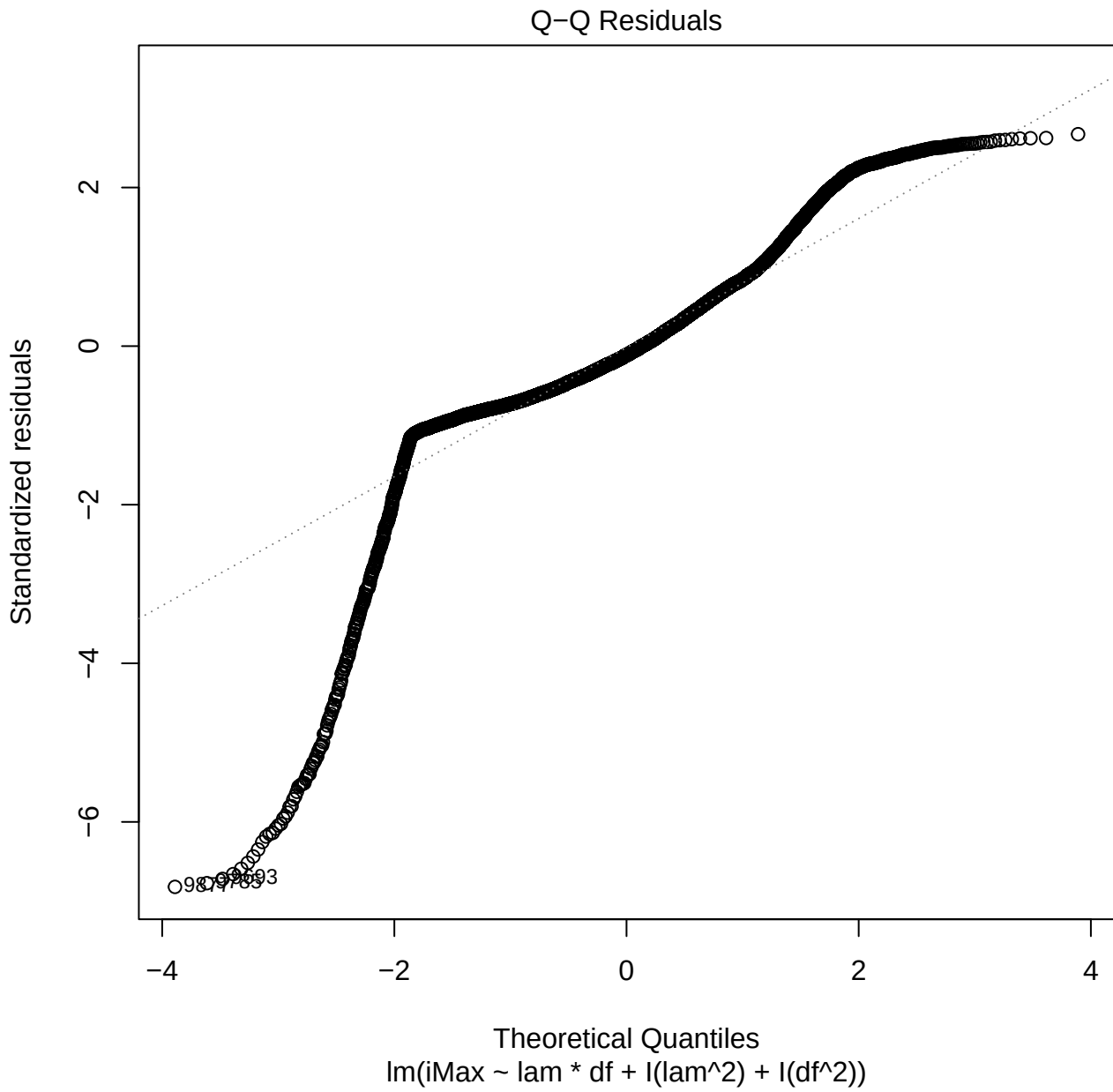


residuals(l.6)

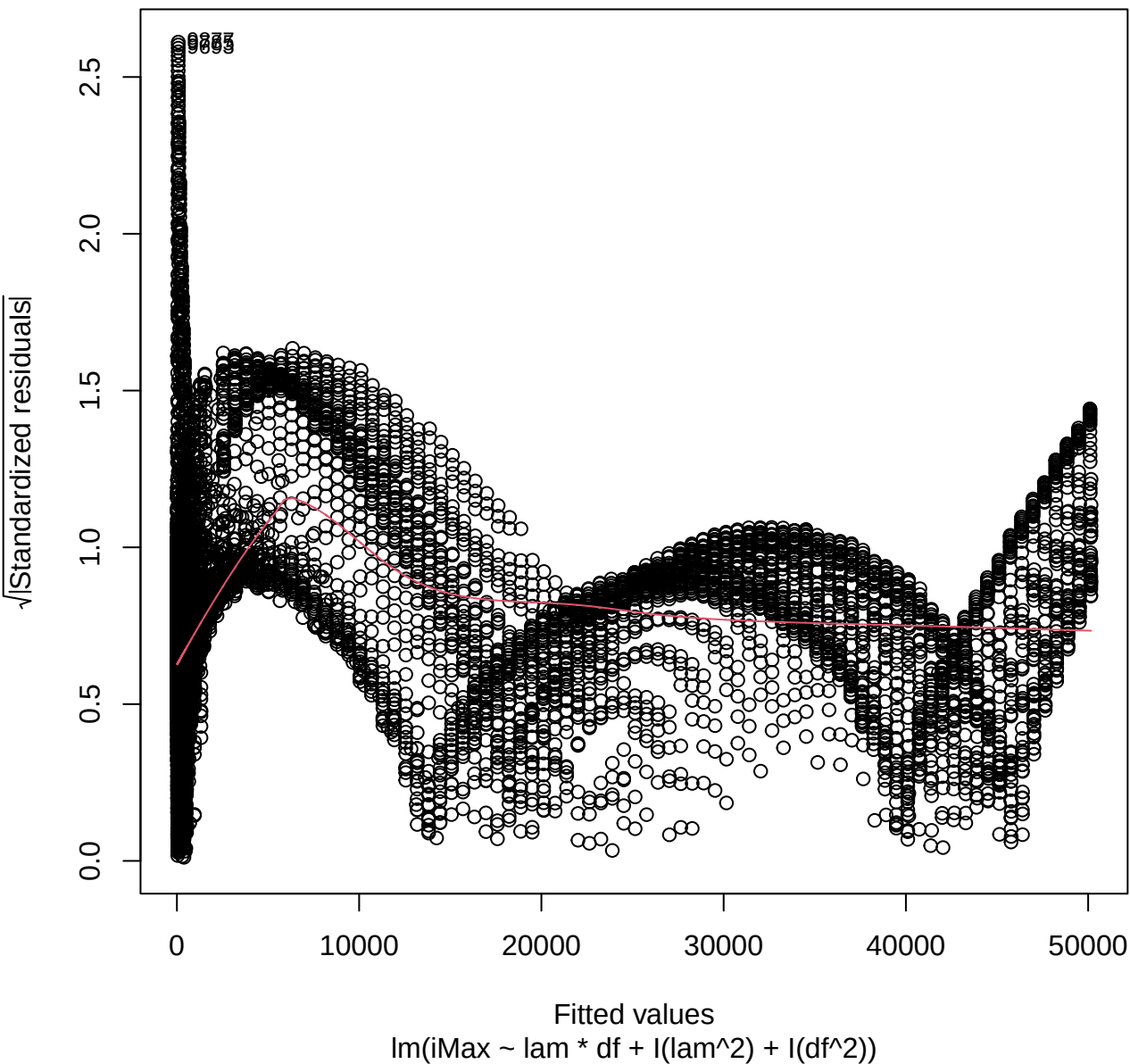


Residuals vs Fitted

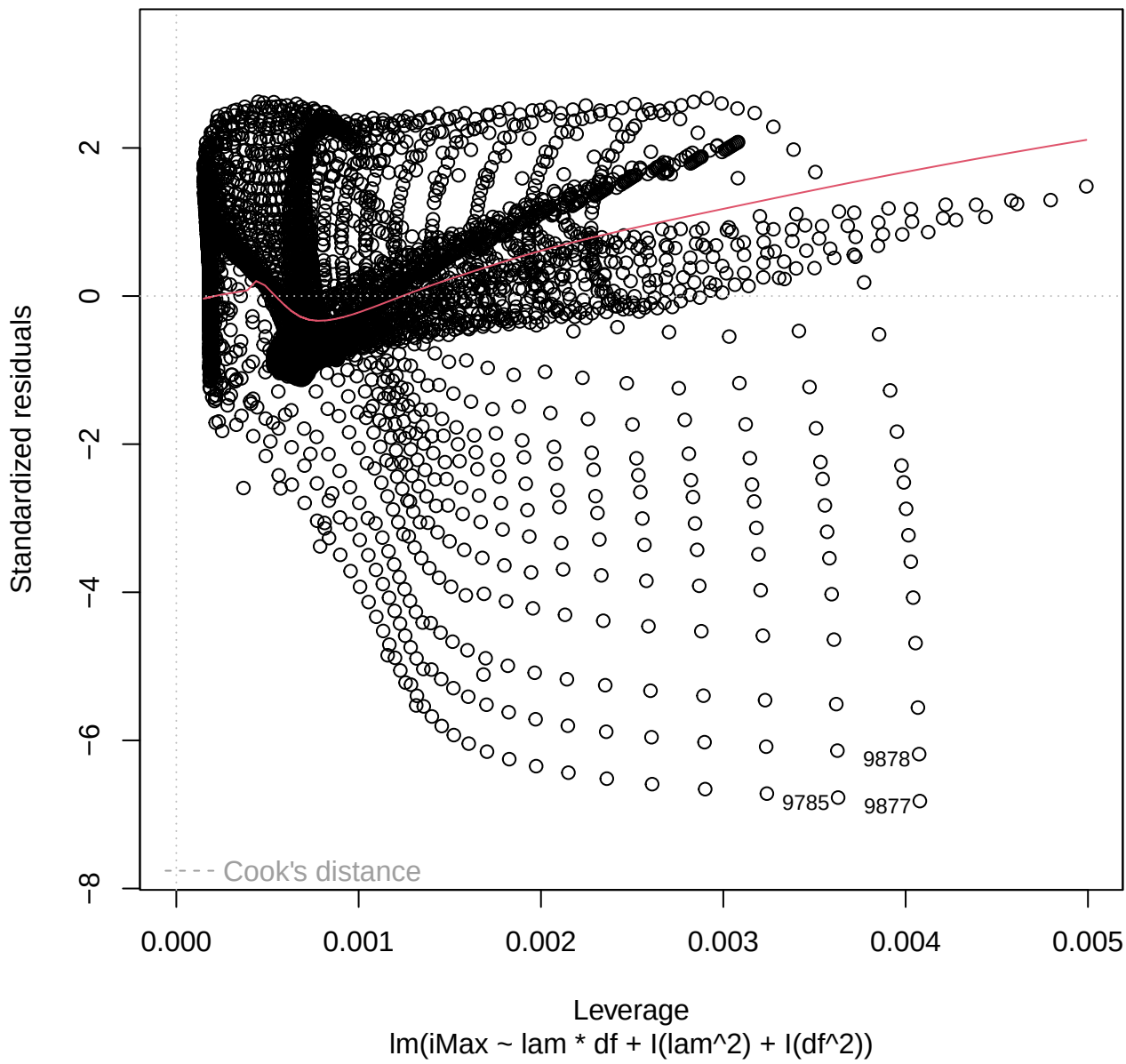


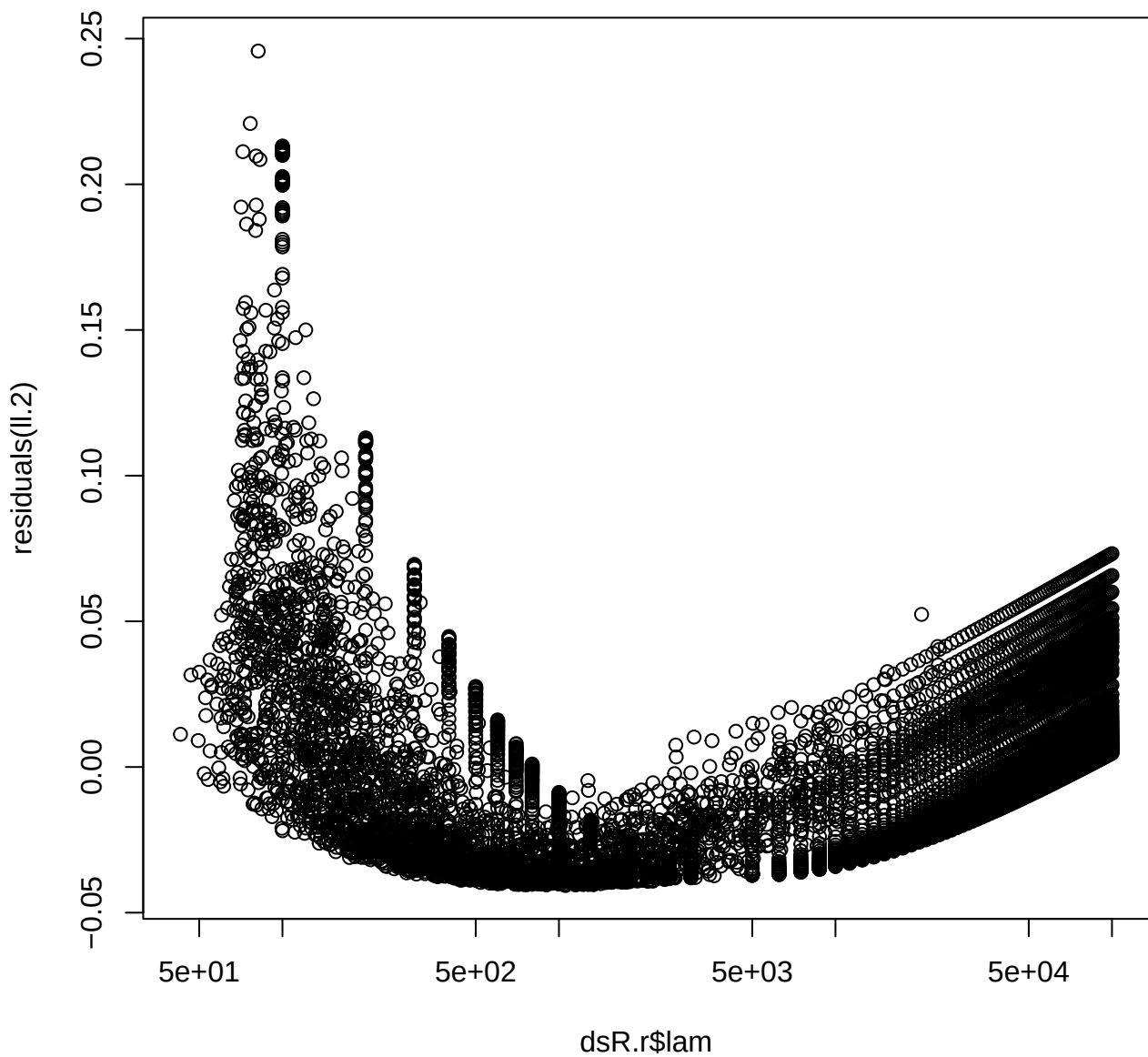


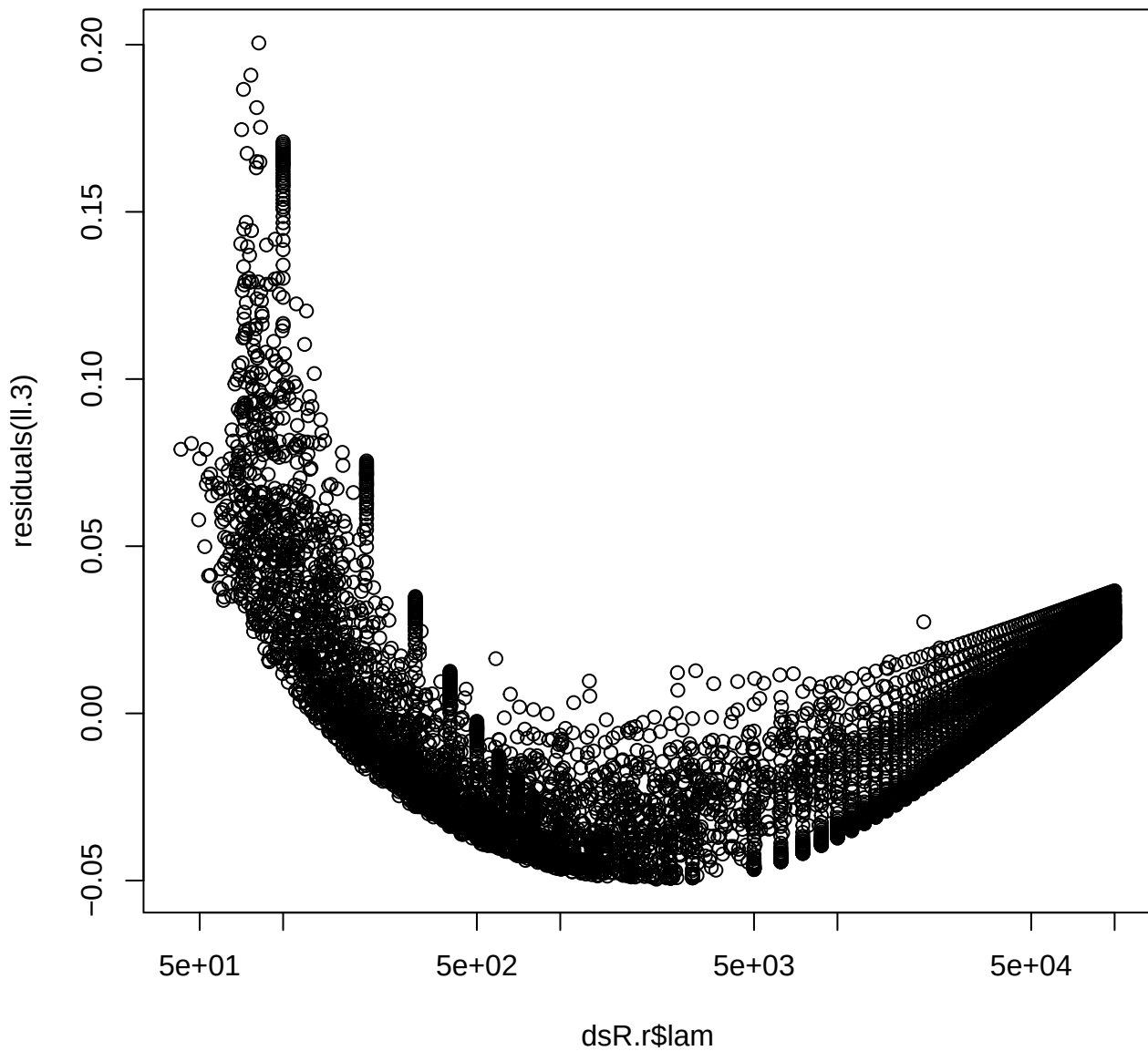
Scale-Location

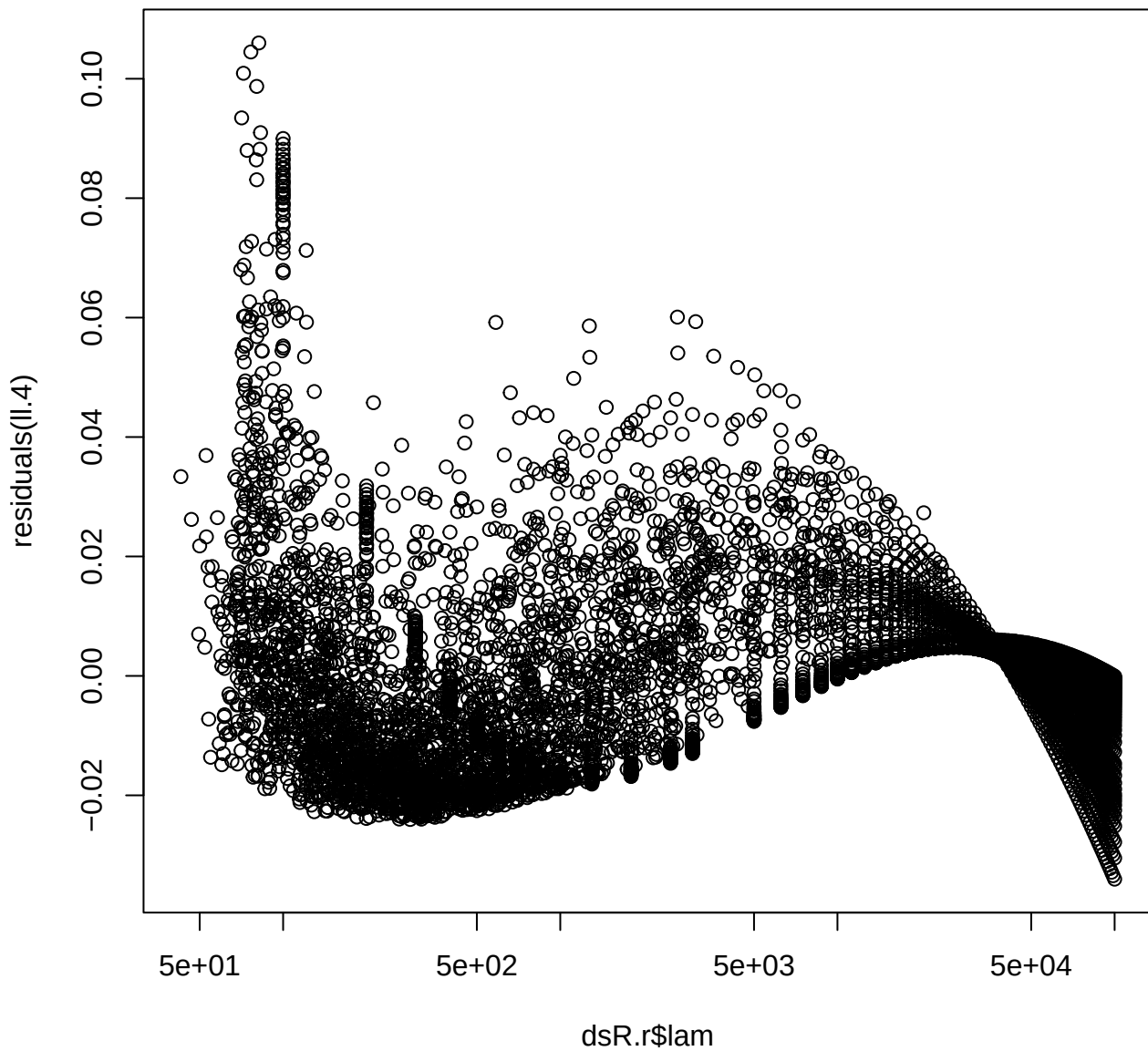


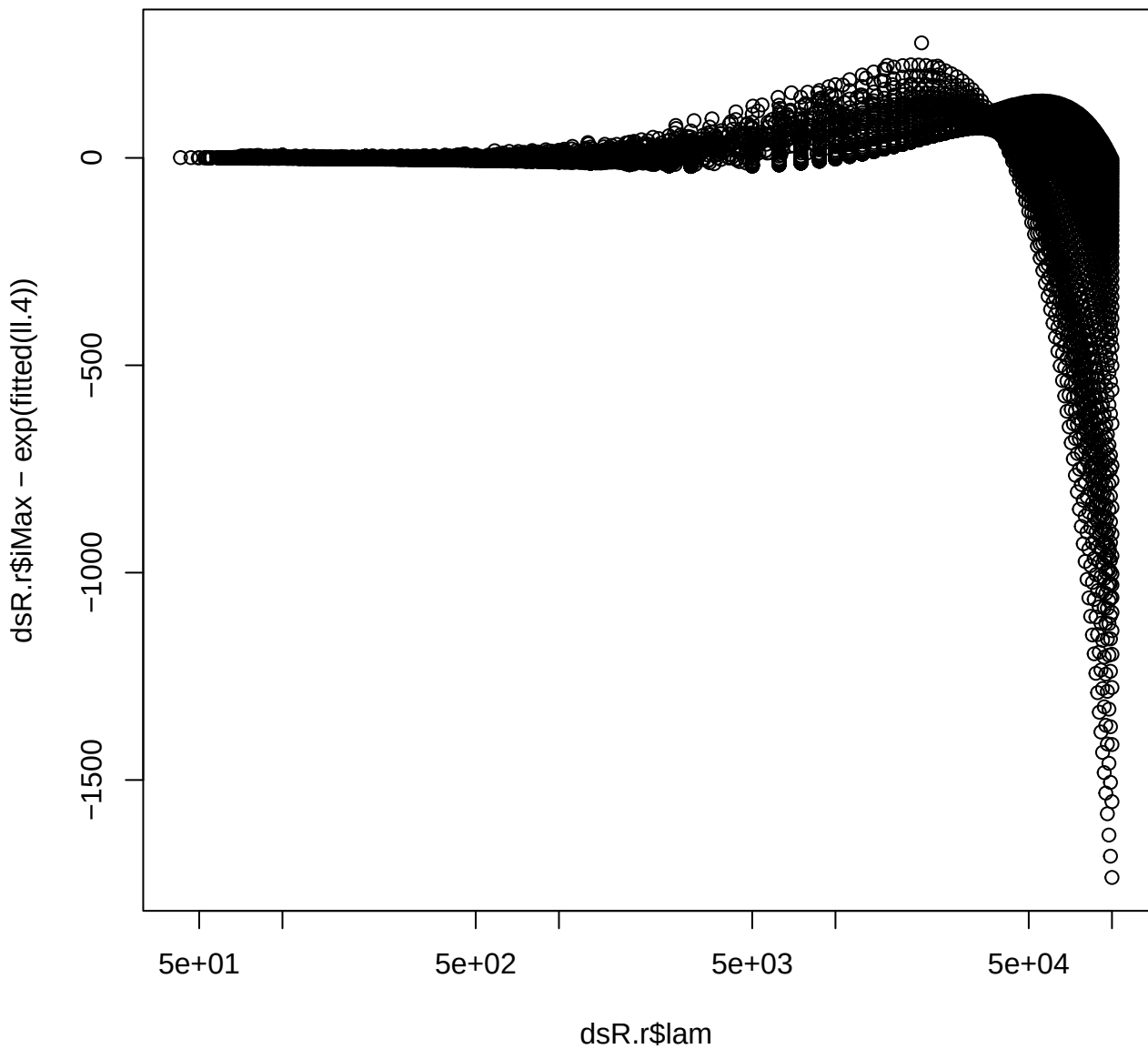
Residuals vs Leverage



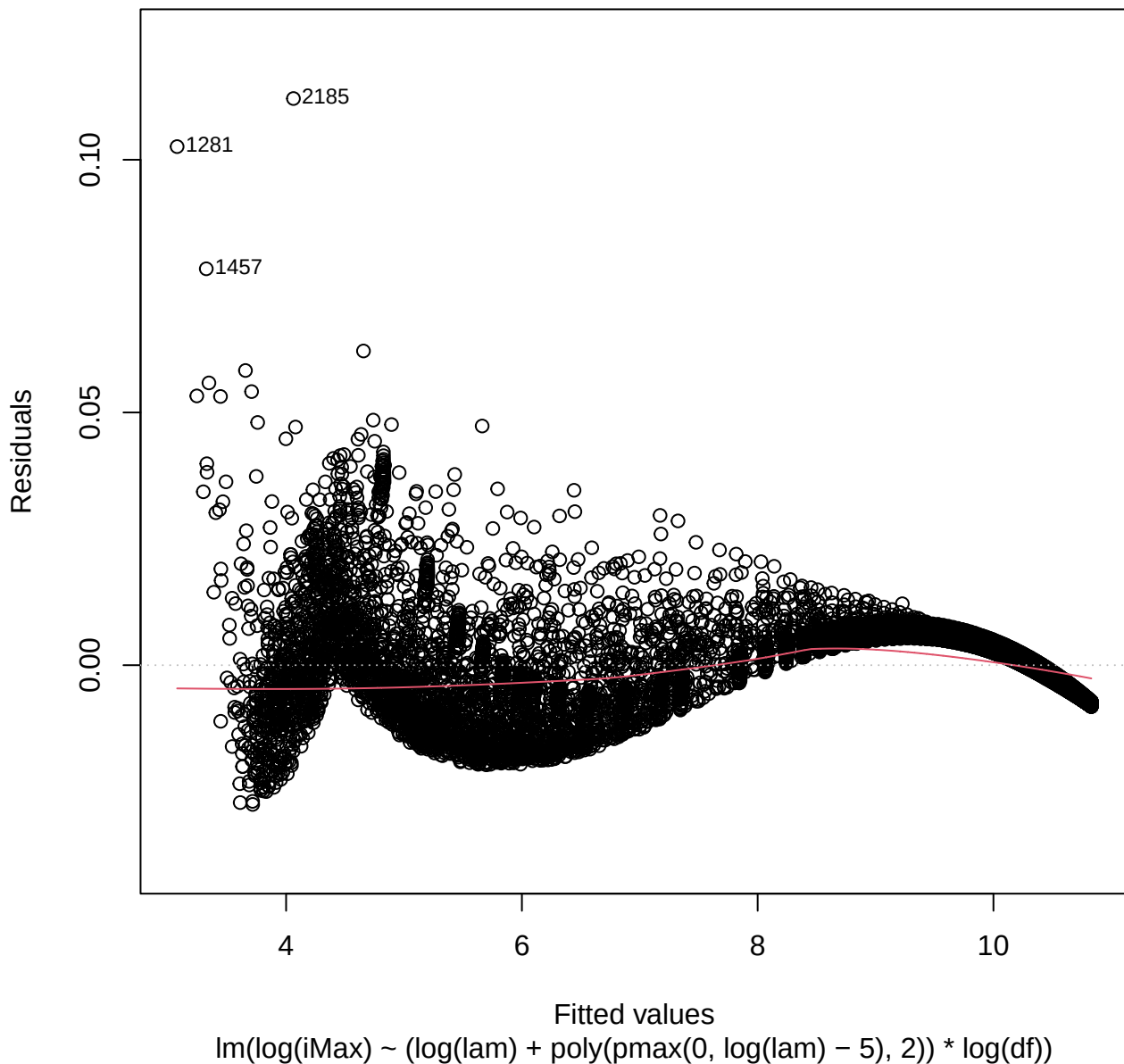




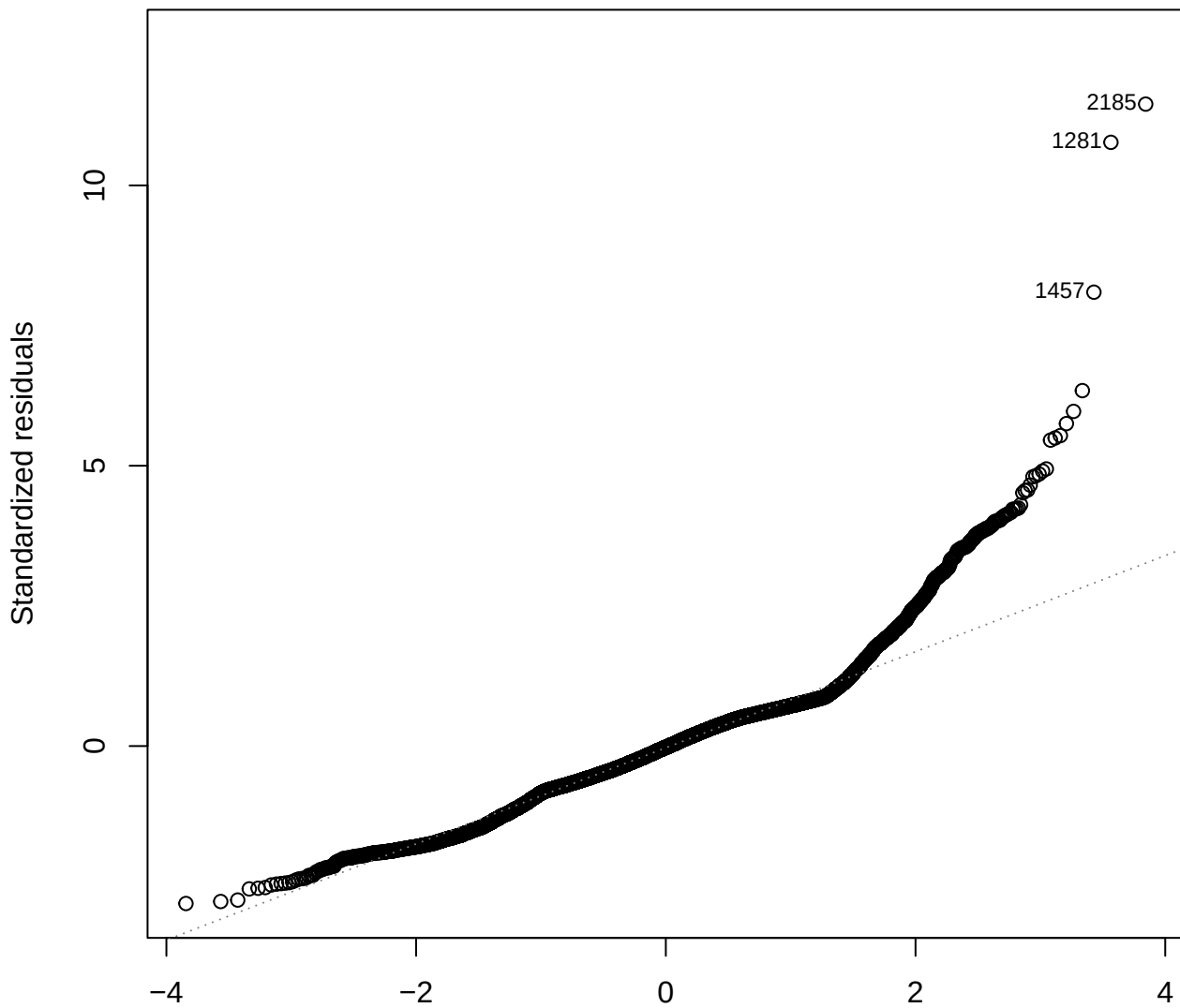




Residuals vs Fitted

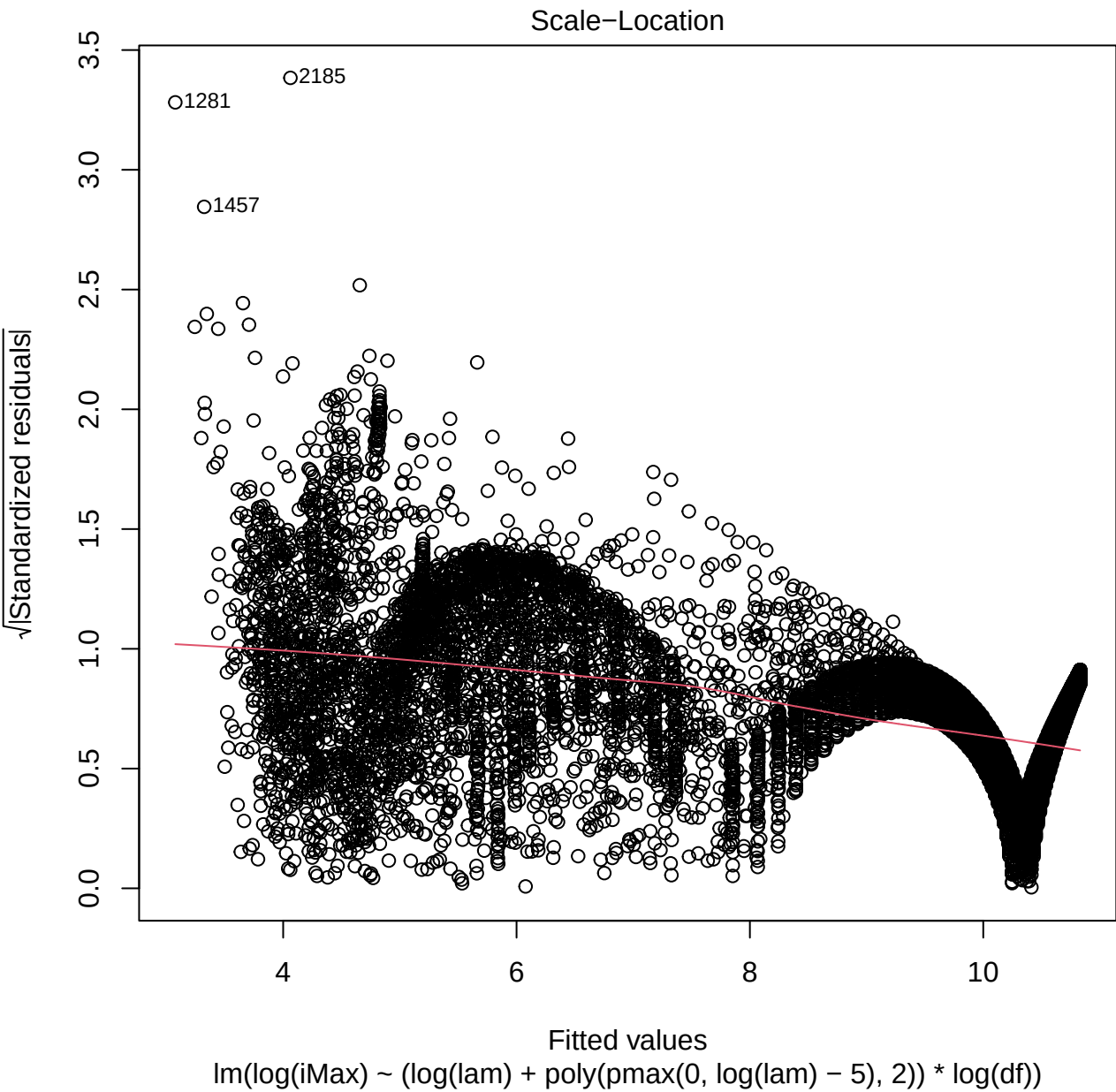


Q-Q Residuals

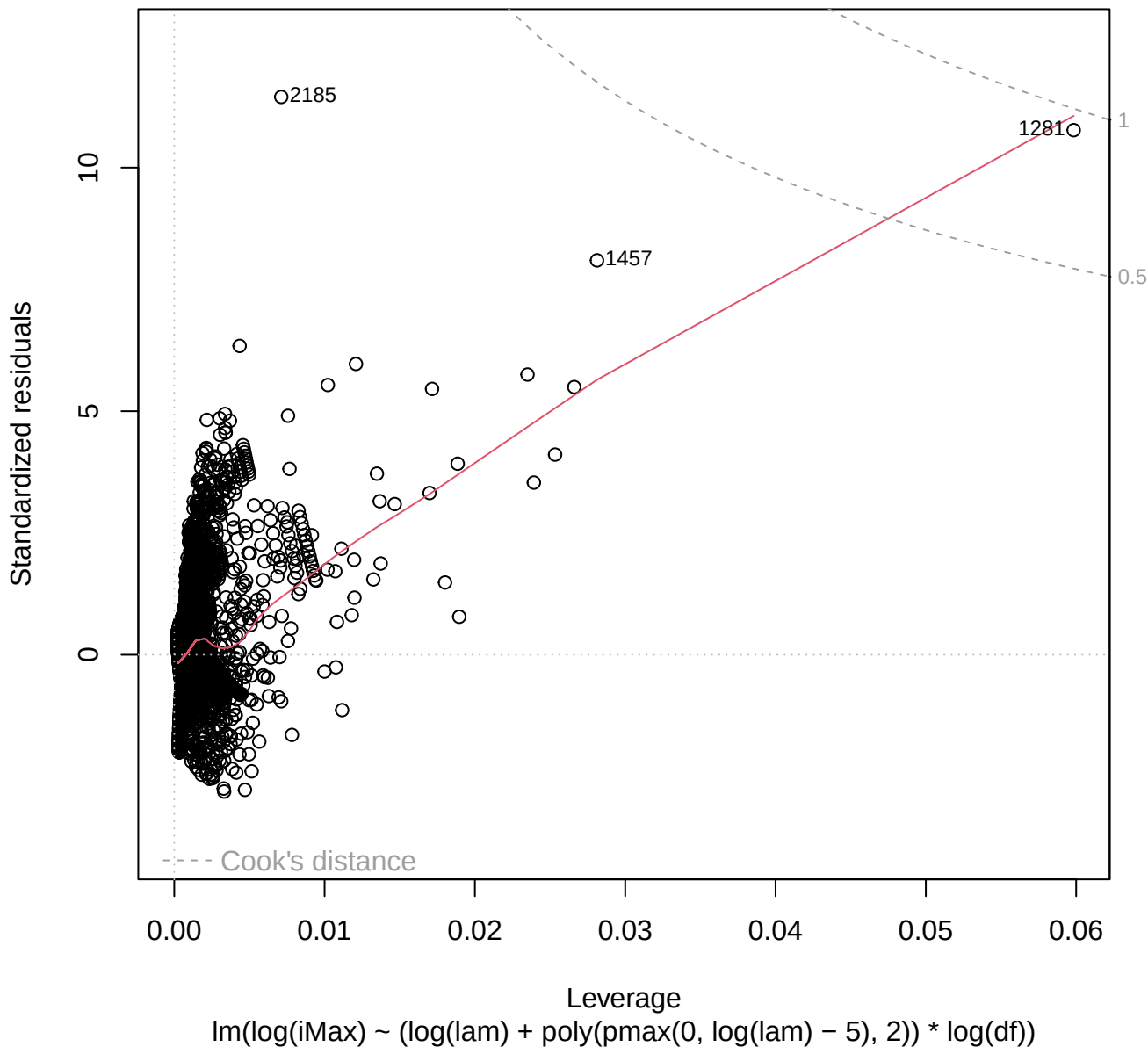


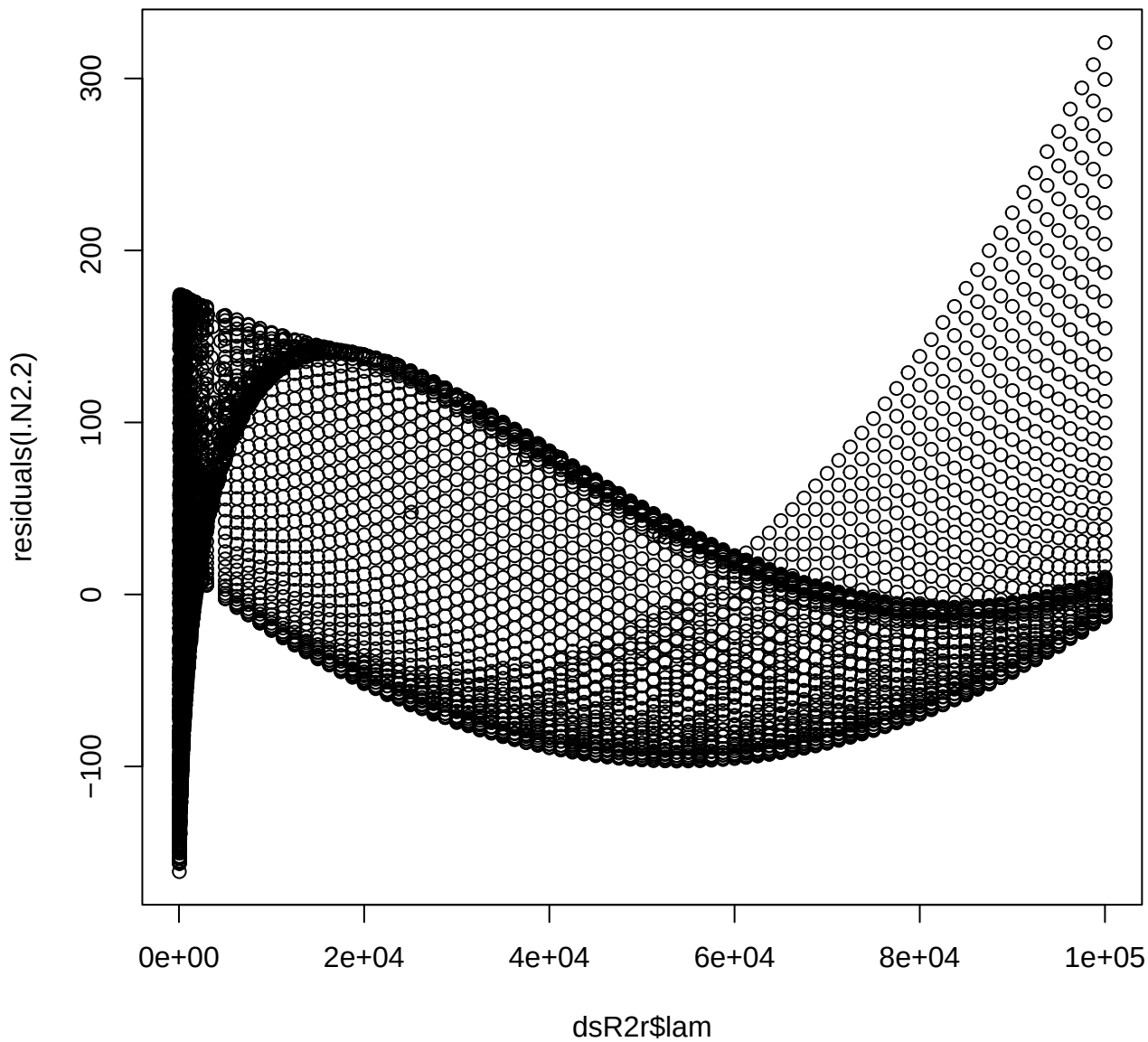
Theoretical Quantiles

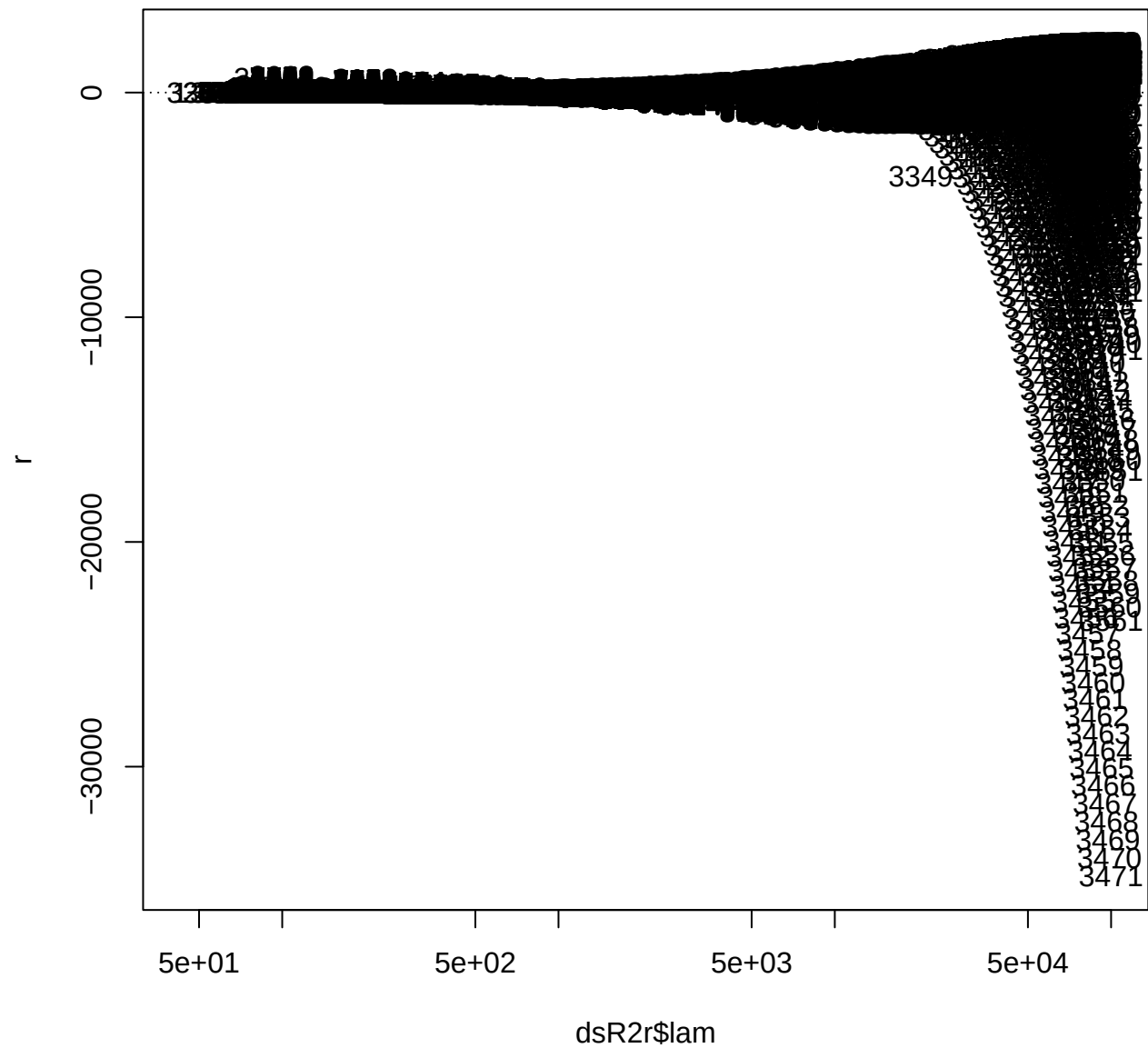
$\ln(\log(iMax) \sim (\log(lam) + \text{poly}(\text{pmax}(0, \log(lam) - 5), 2)) * \log(df))$

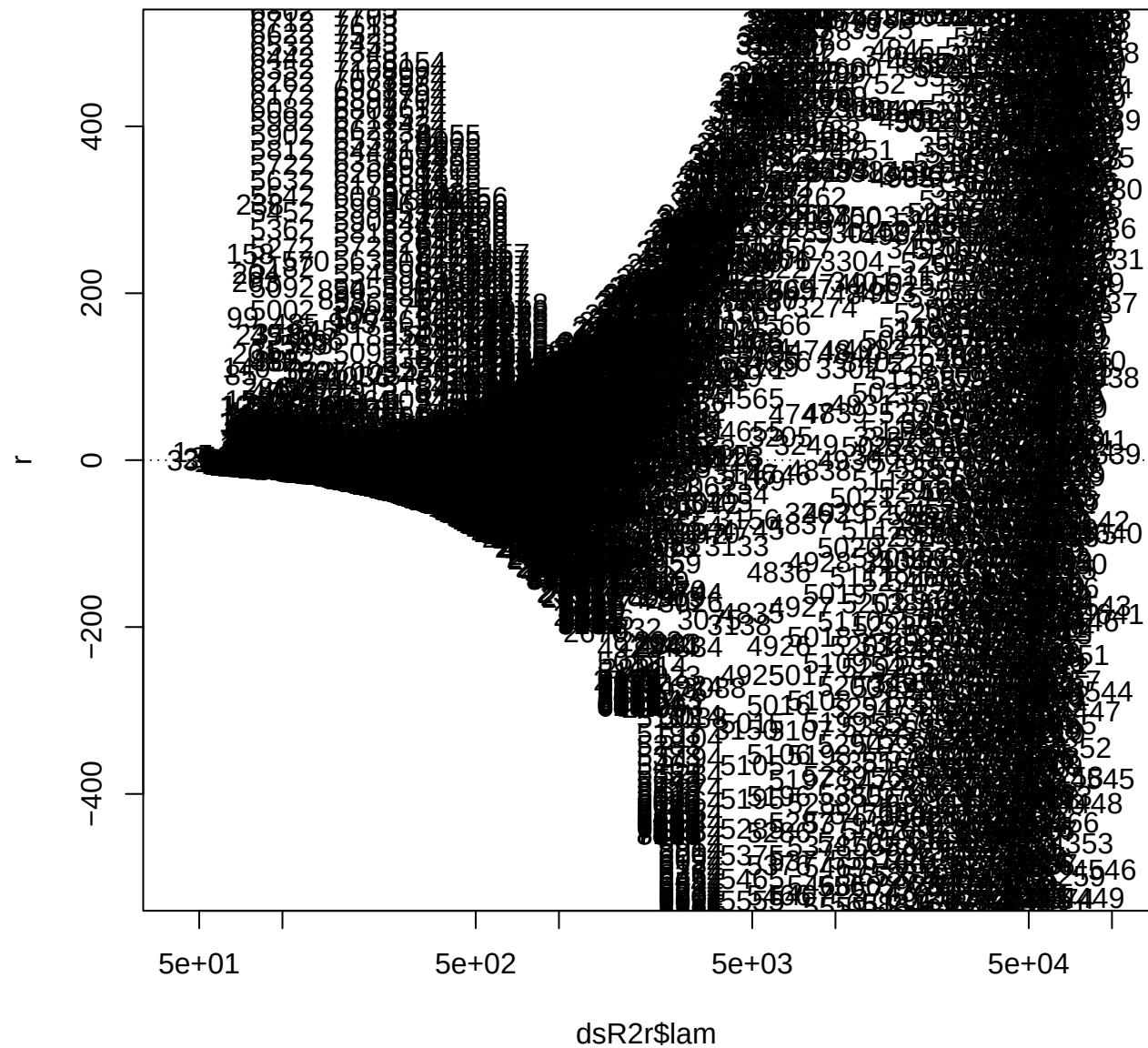


Residuals vs Leverage

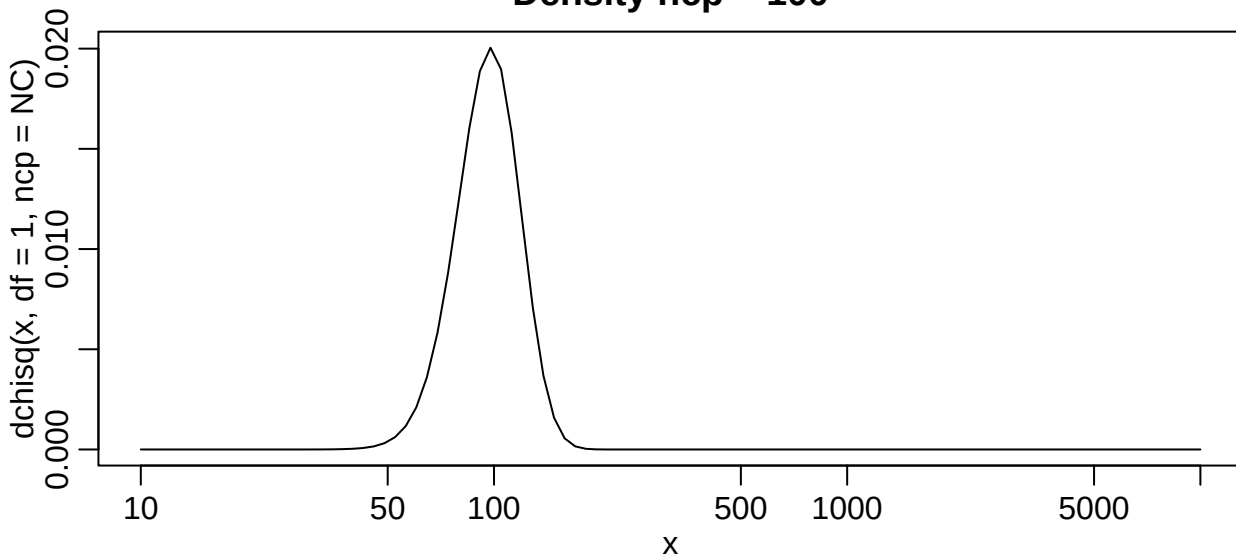




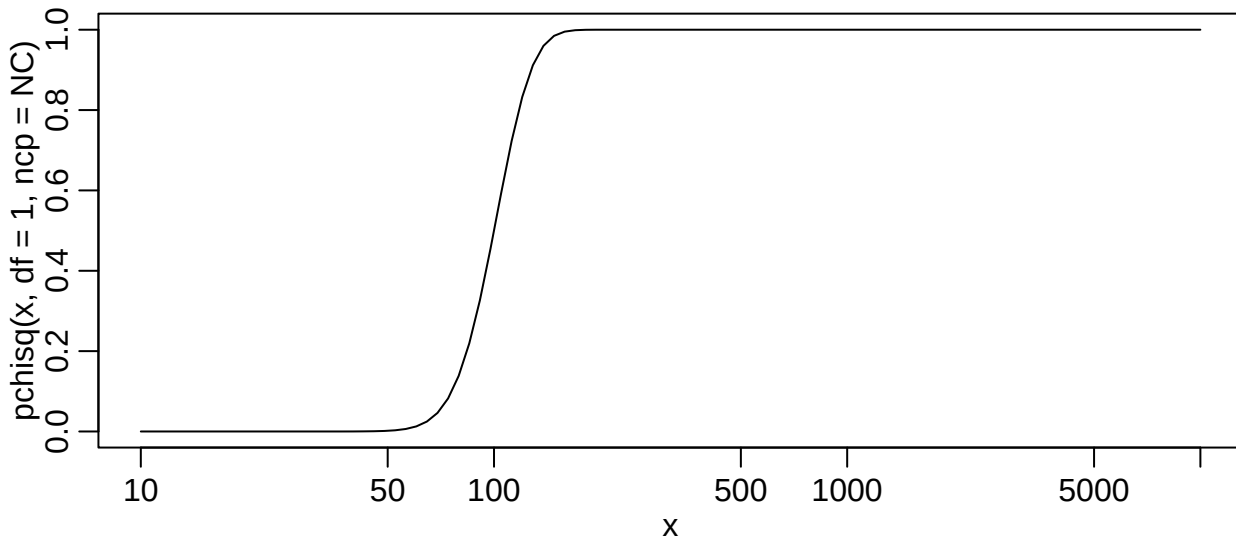




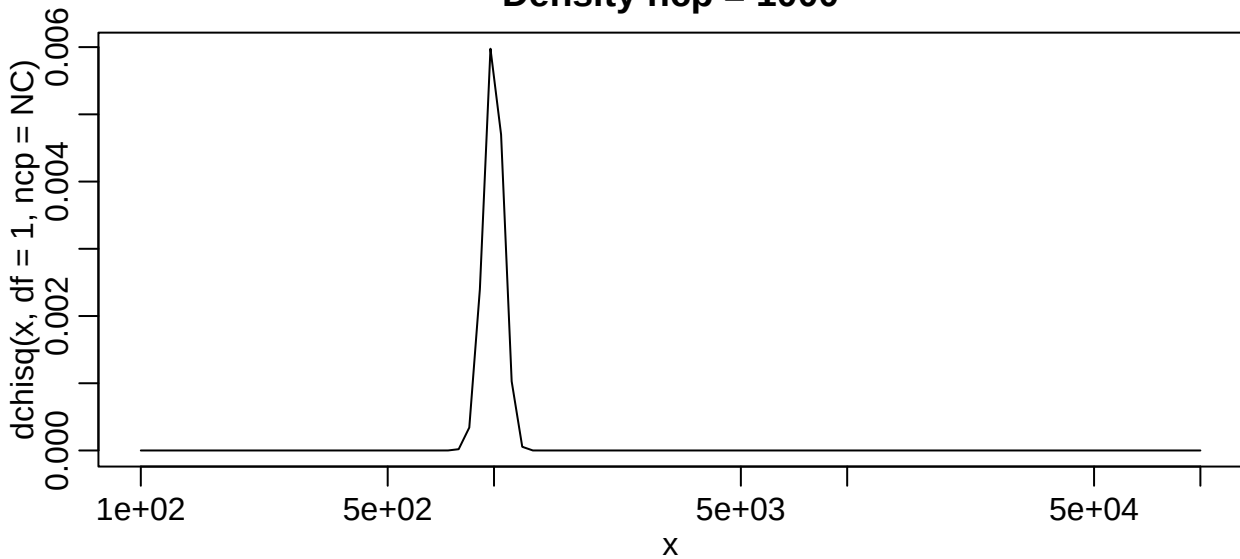
Density ncp = 100



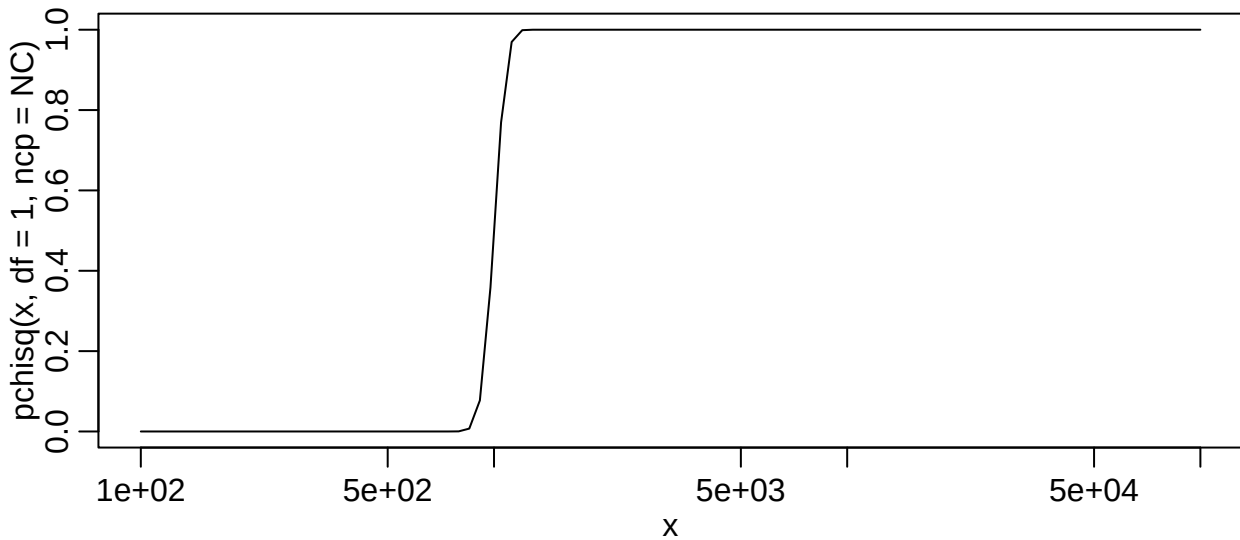
CDF ncp = 100



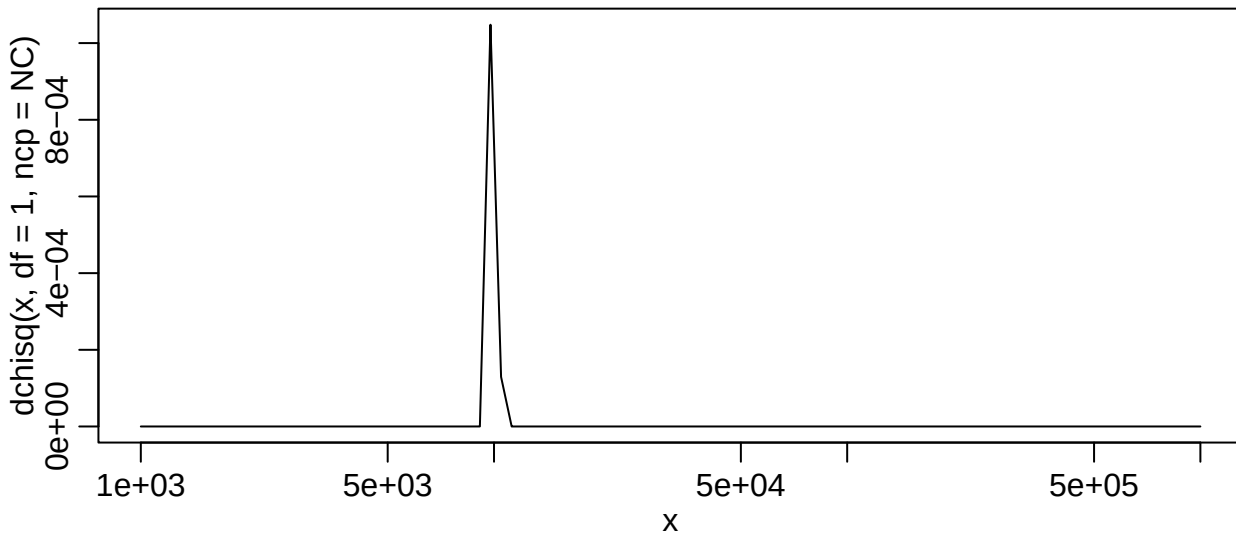
Density ncp = 1000



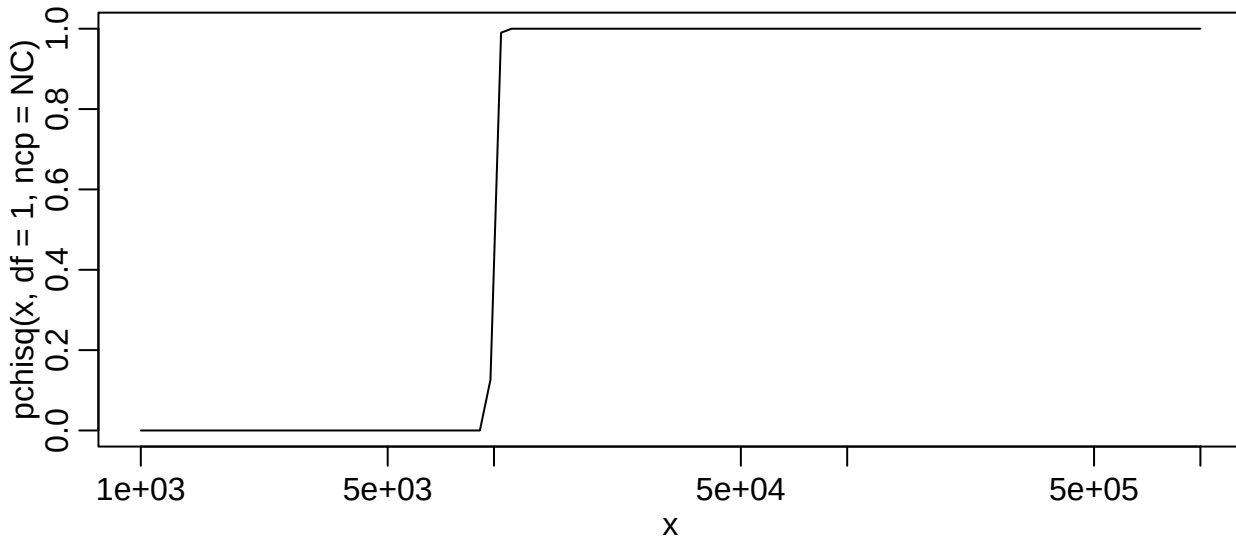
CDF ncp = 1000



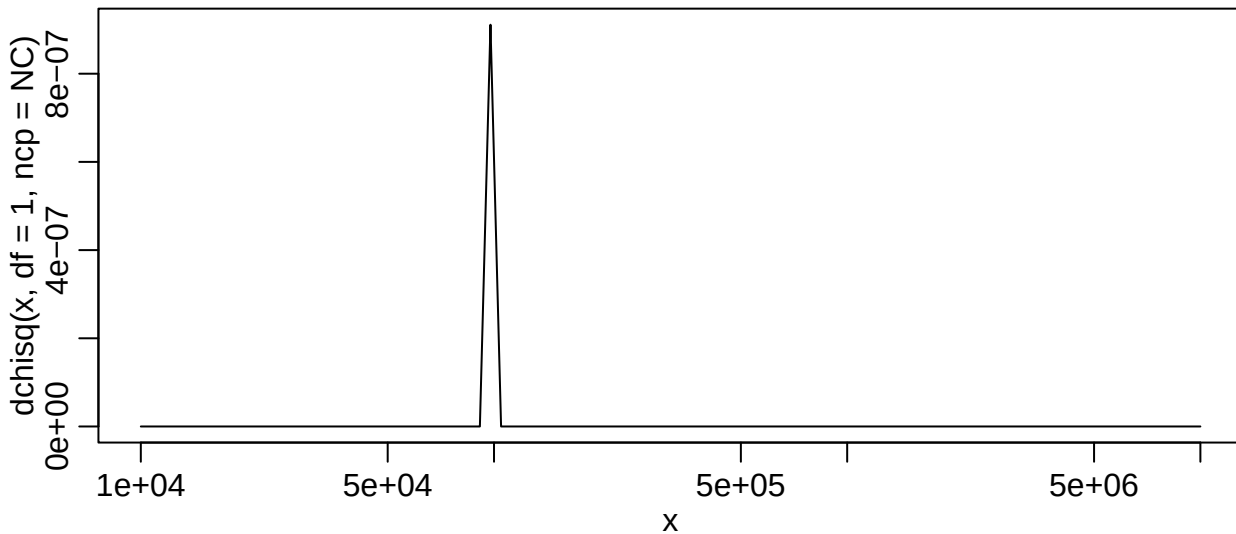
Density ncp = 10000



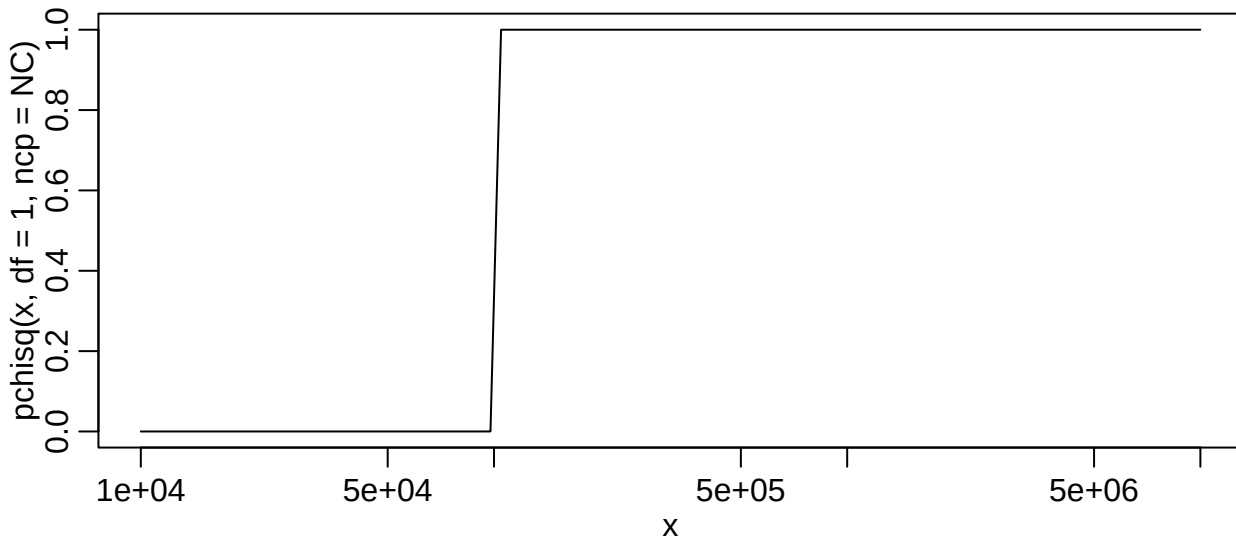
CDF ncp = 10000



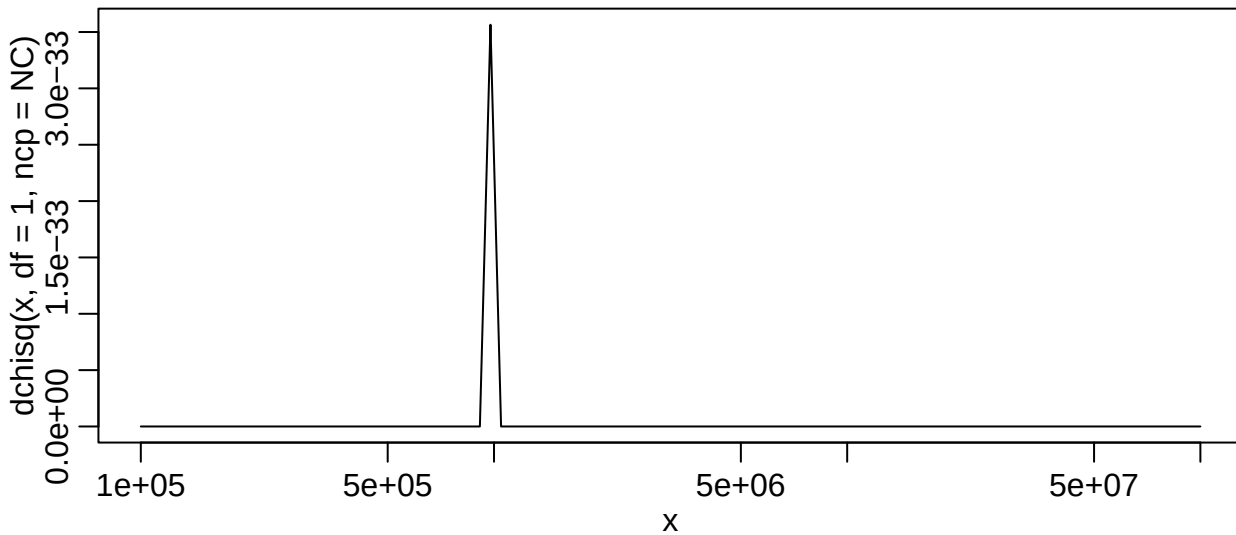
Density ncp = 1e+05



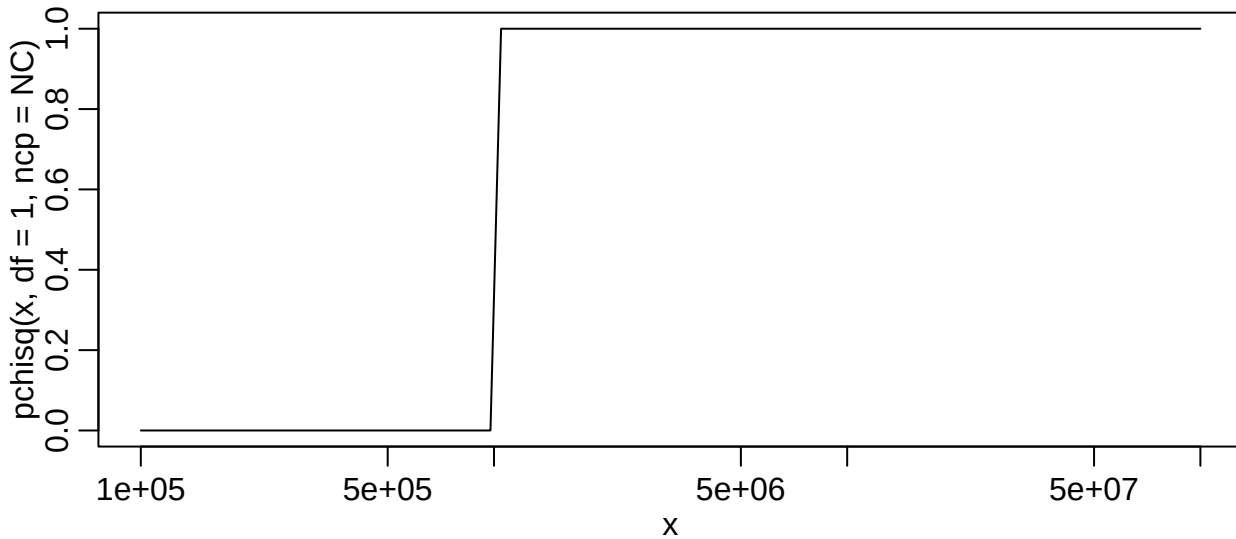
CDF ncp = 1e+05

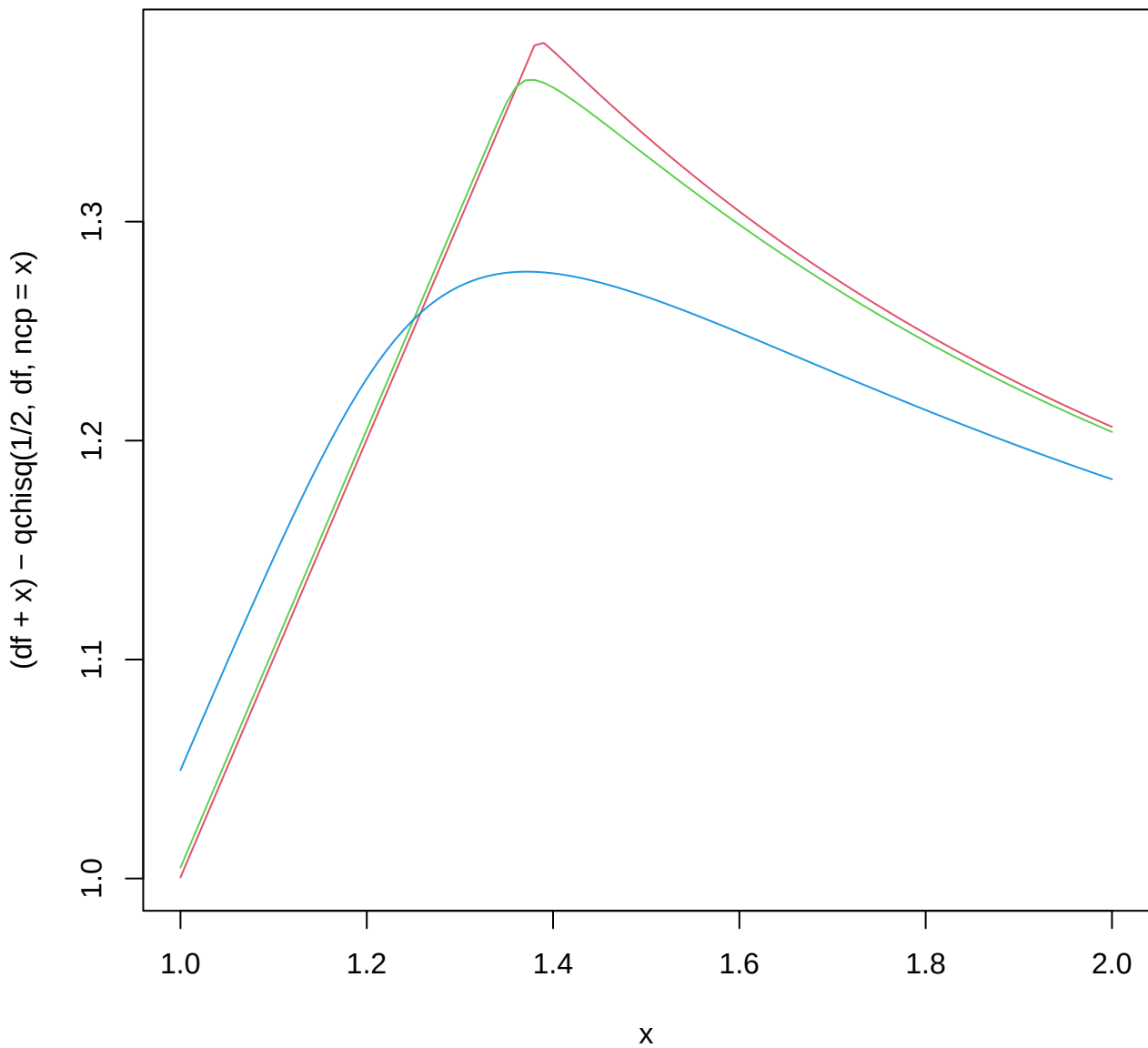


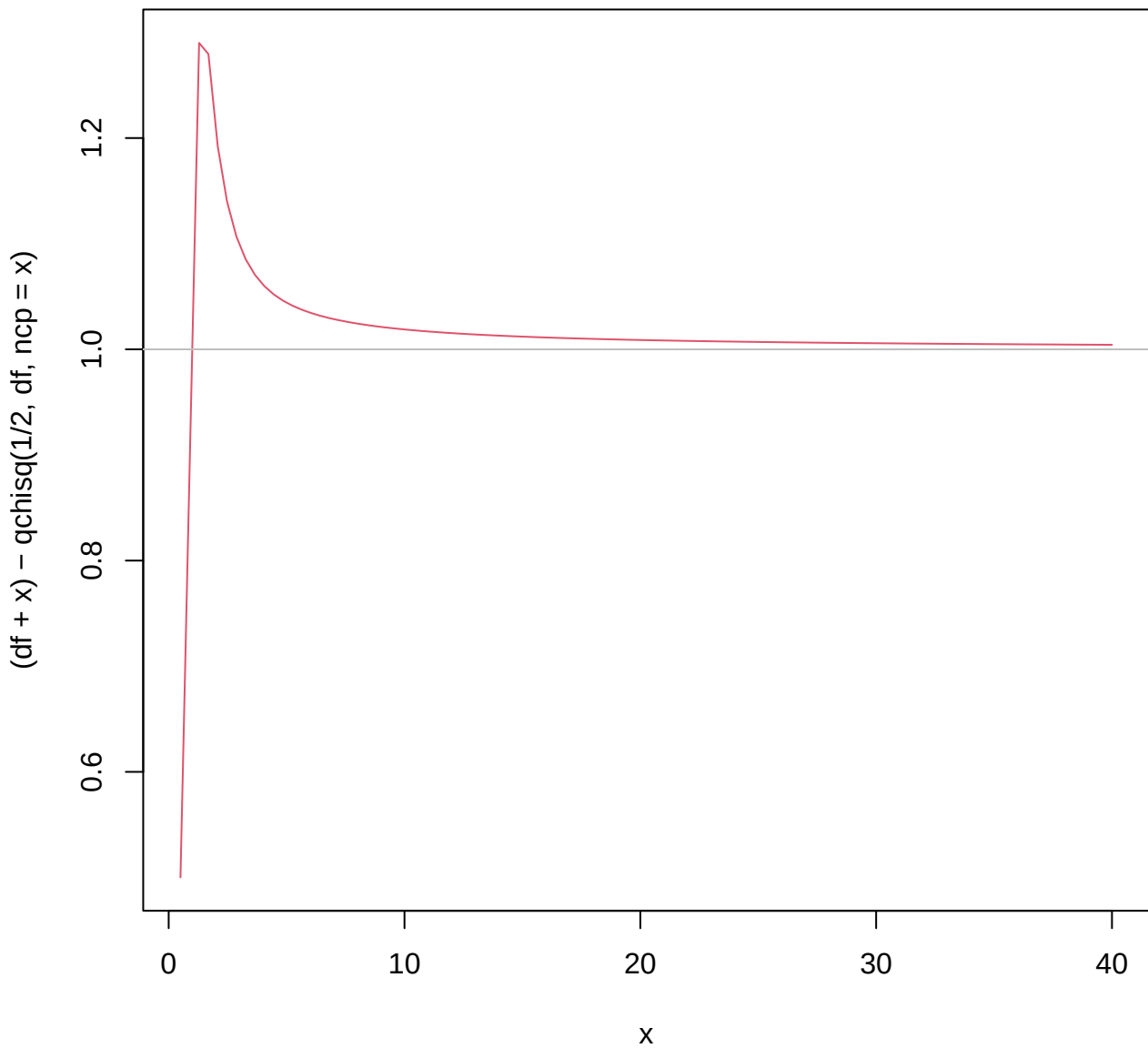
Density ncp = 1e+06

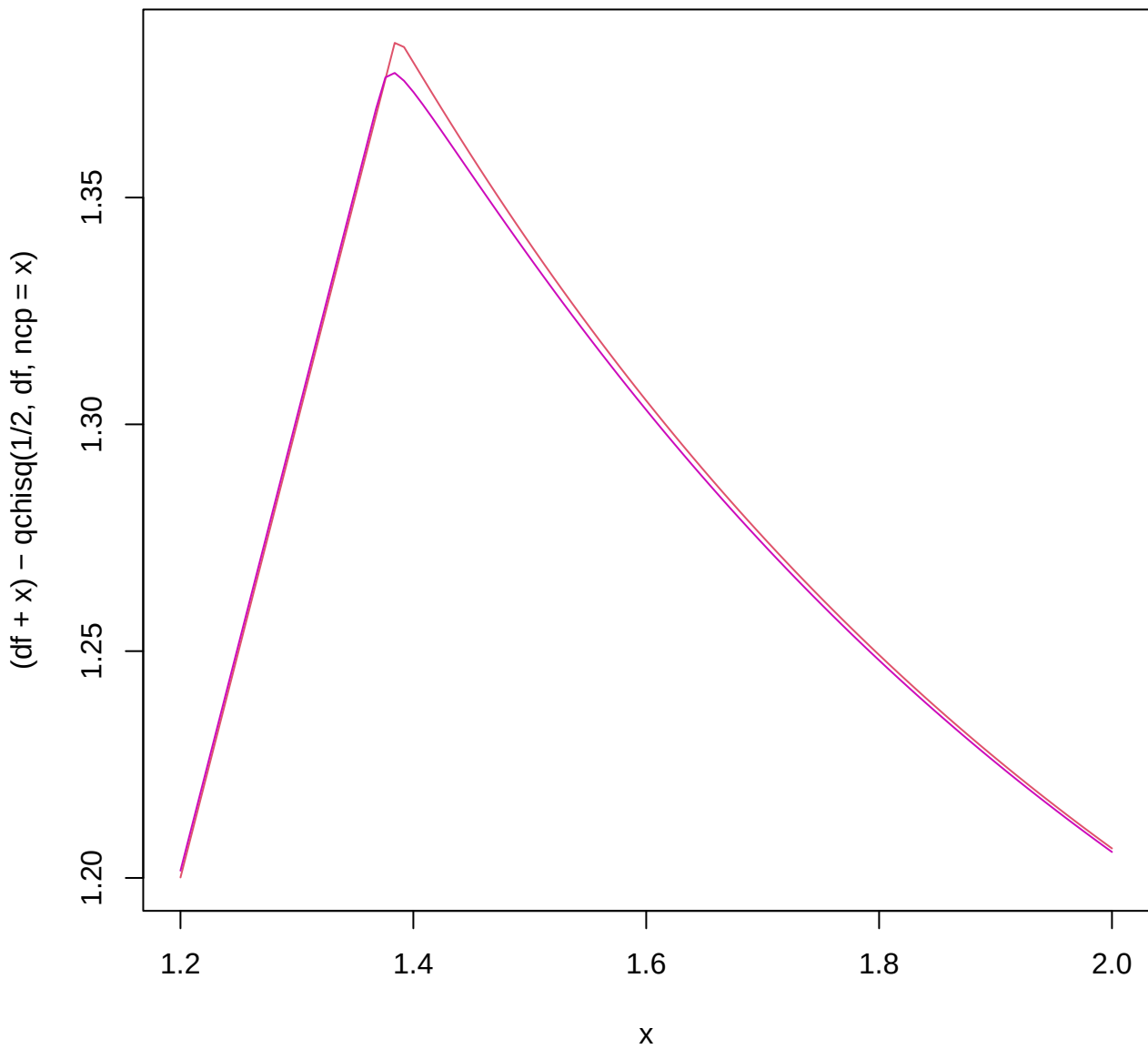


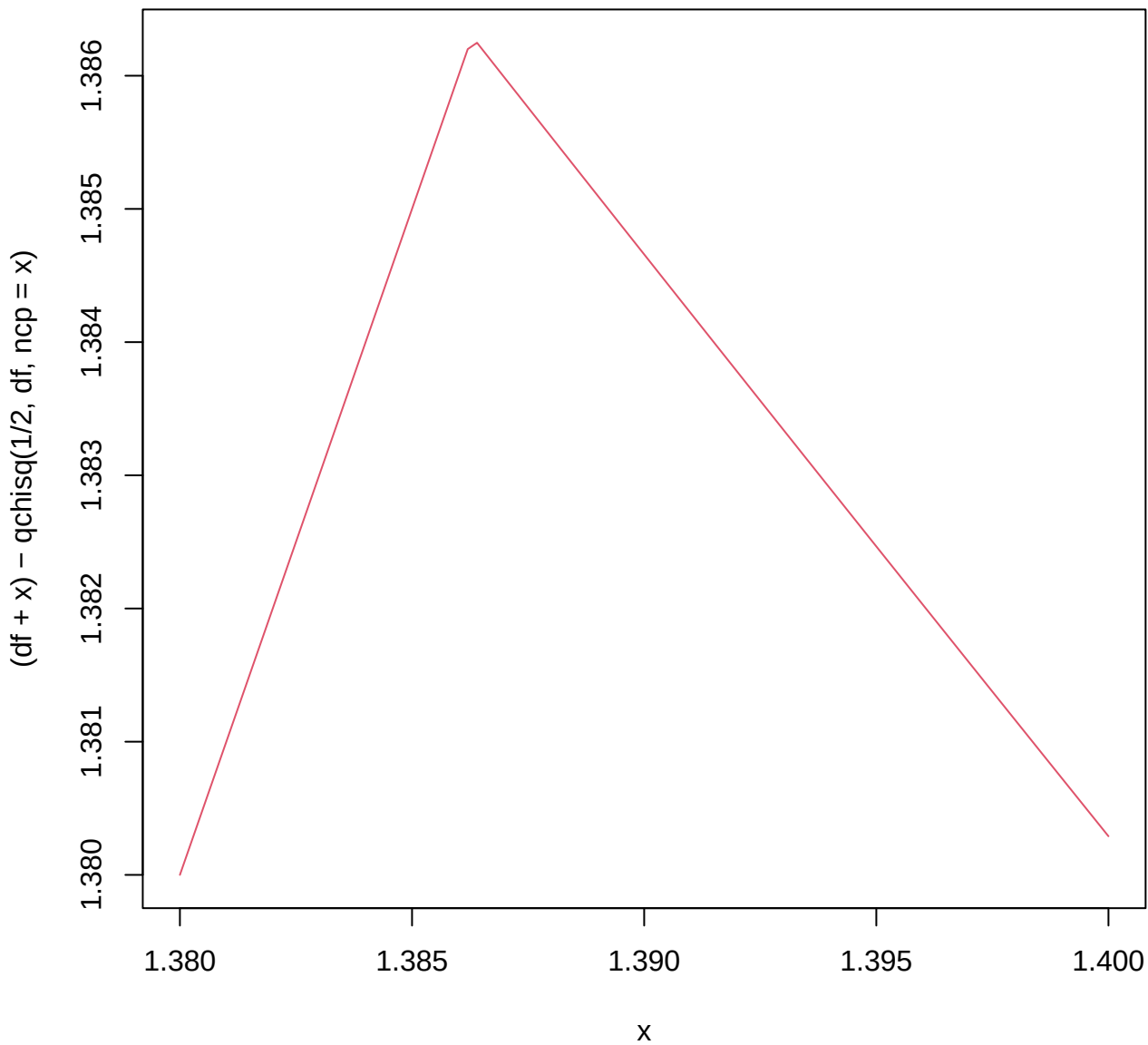
CDF ncp = 1e+06



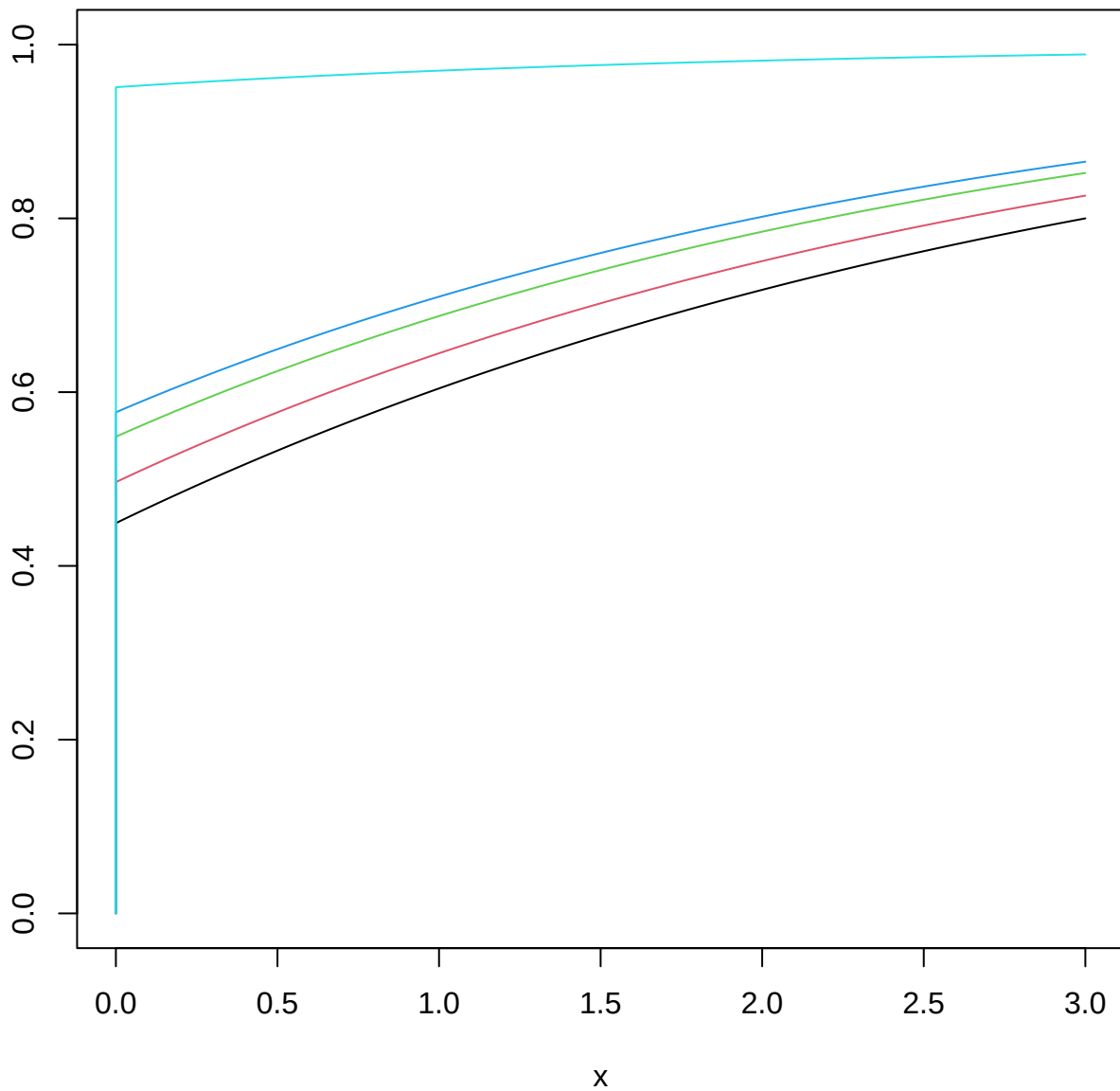




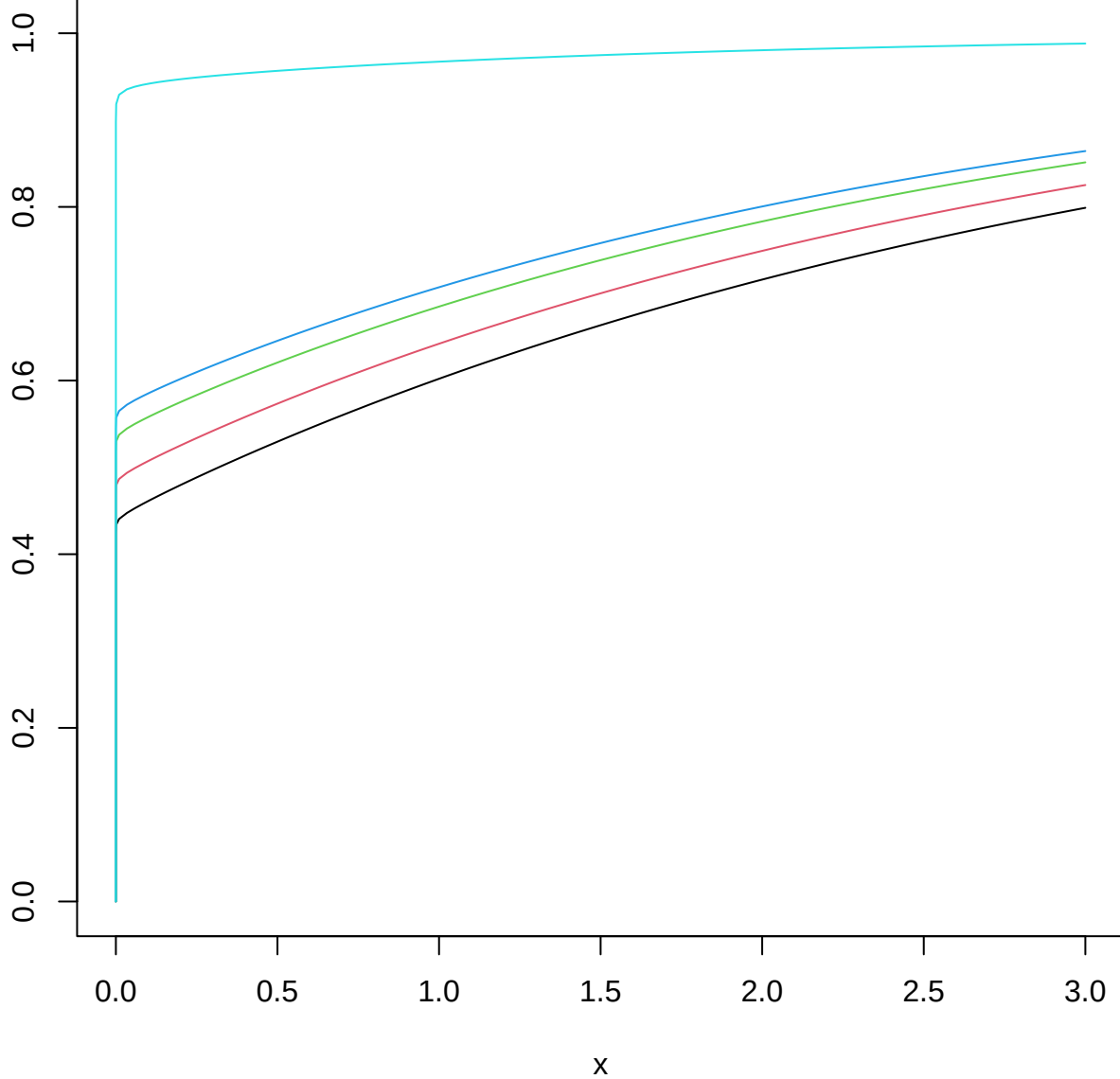


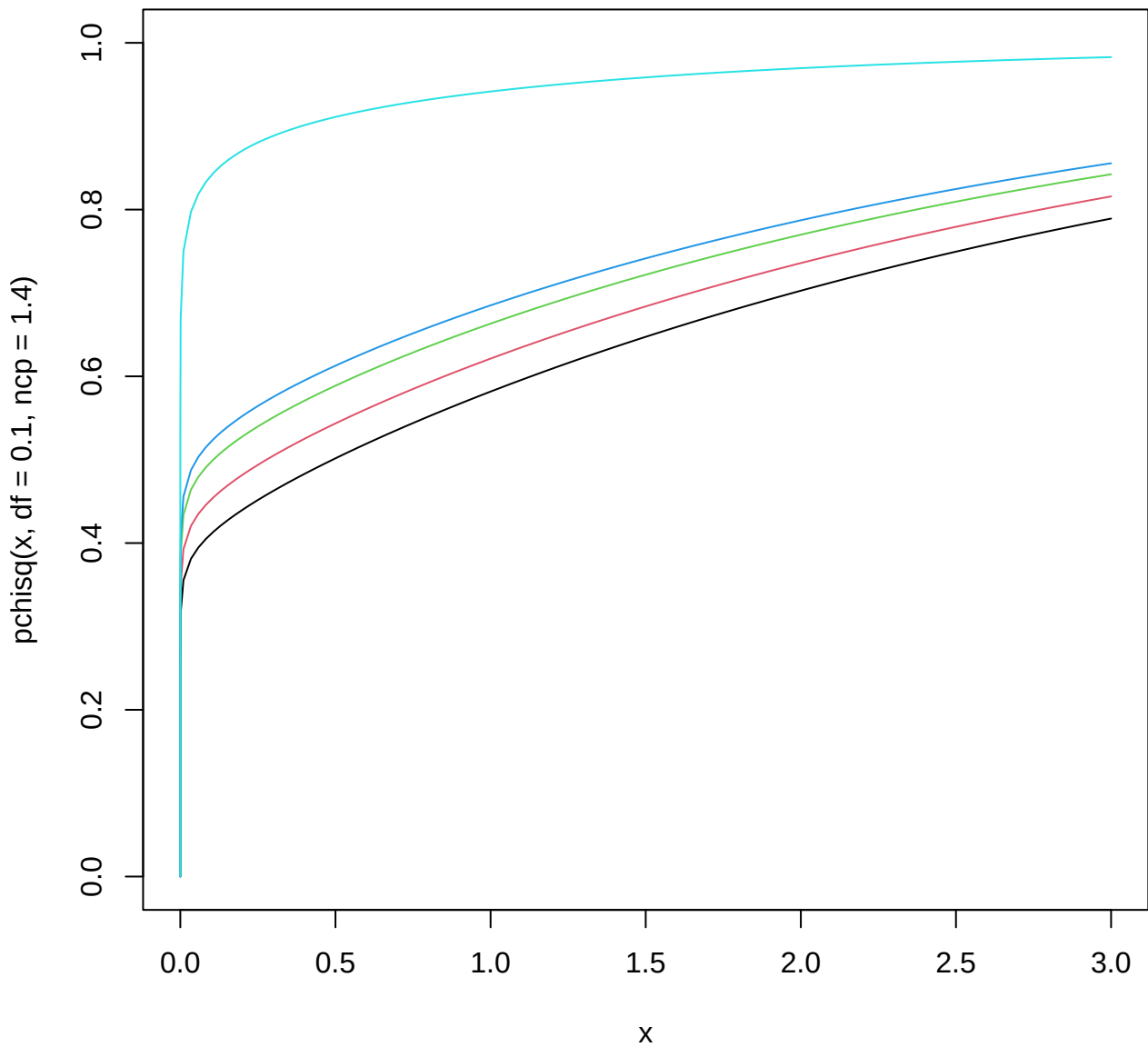


pchisq(x, df = 1e-04, ncp = 1.4)



pchisq(x, df = 0.01, ncp = 1.4)



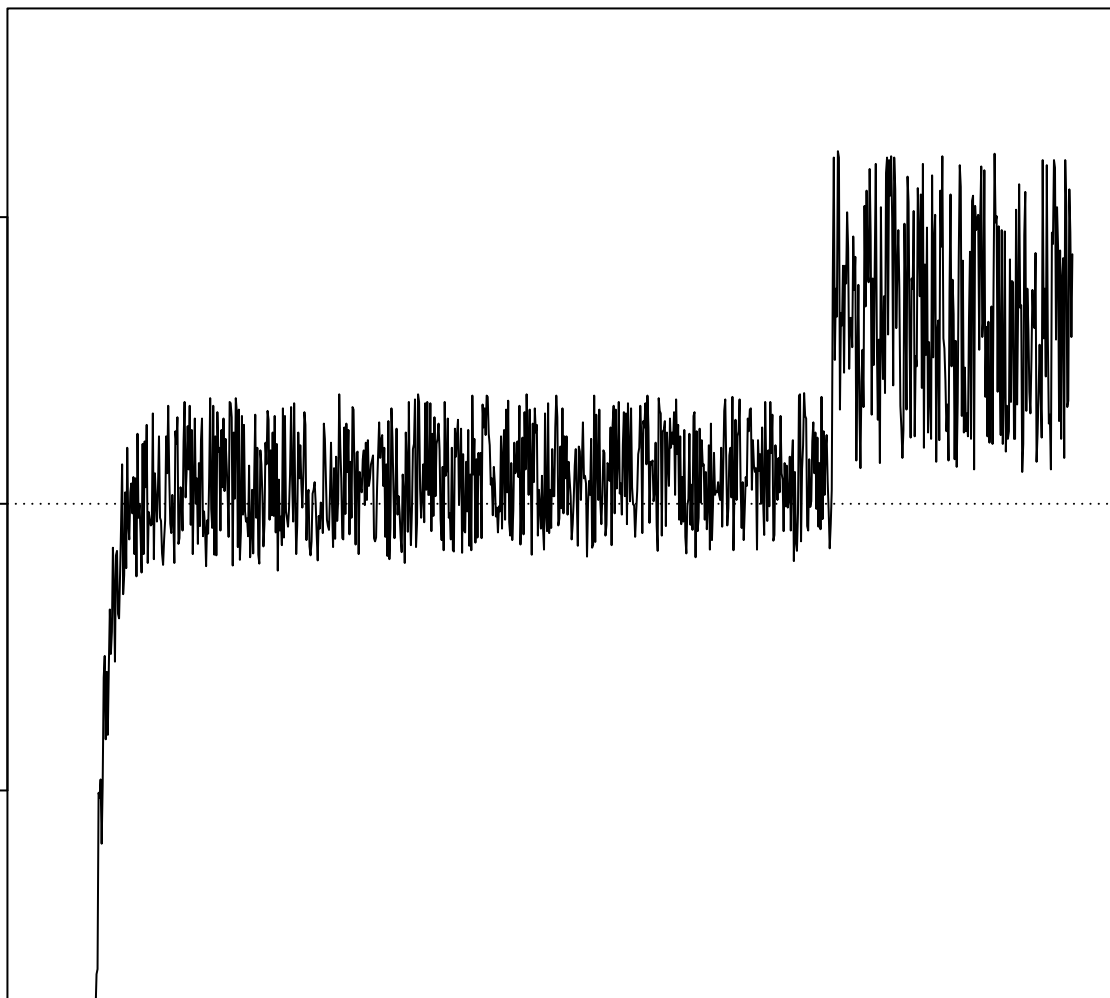


pchisq(x, 1.01, ncp = 80, log = TRUE)

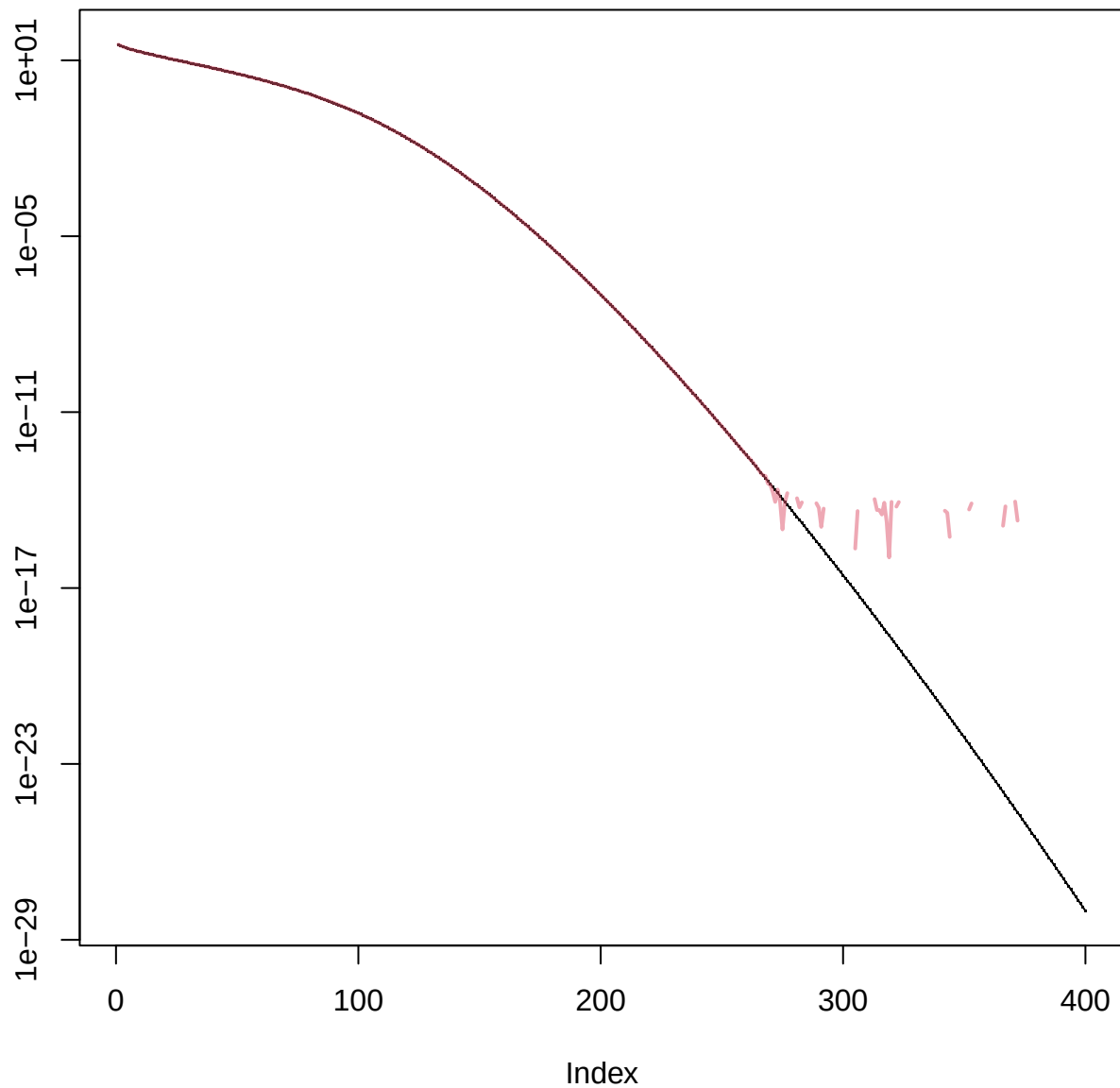
5e-14
0e+00
-5e-14

250 300 350 400 450 500 550 600

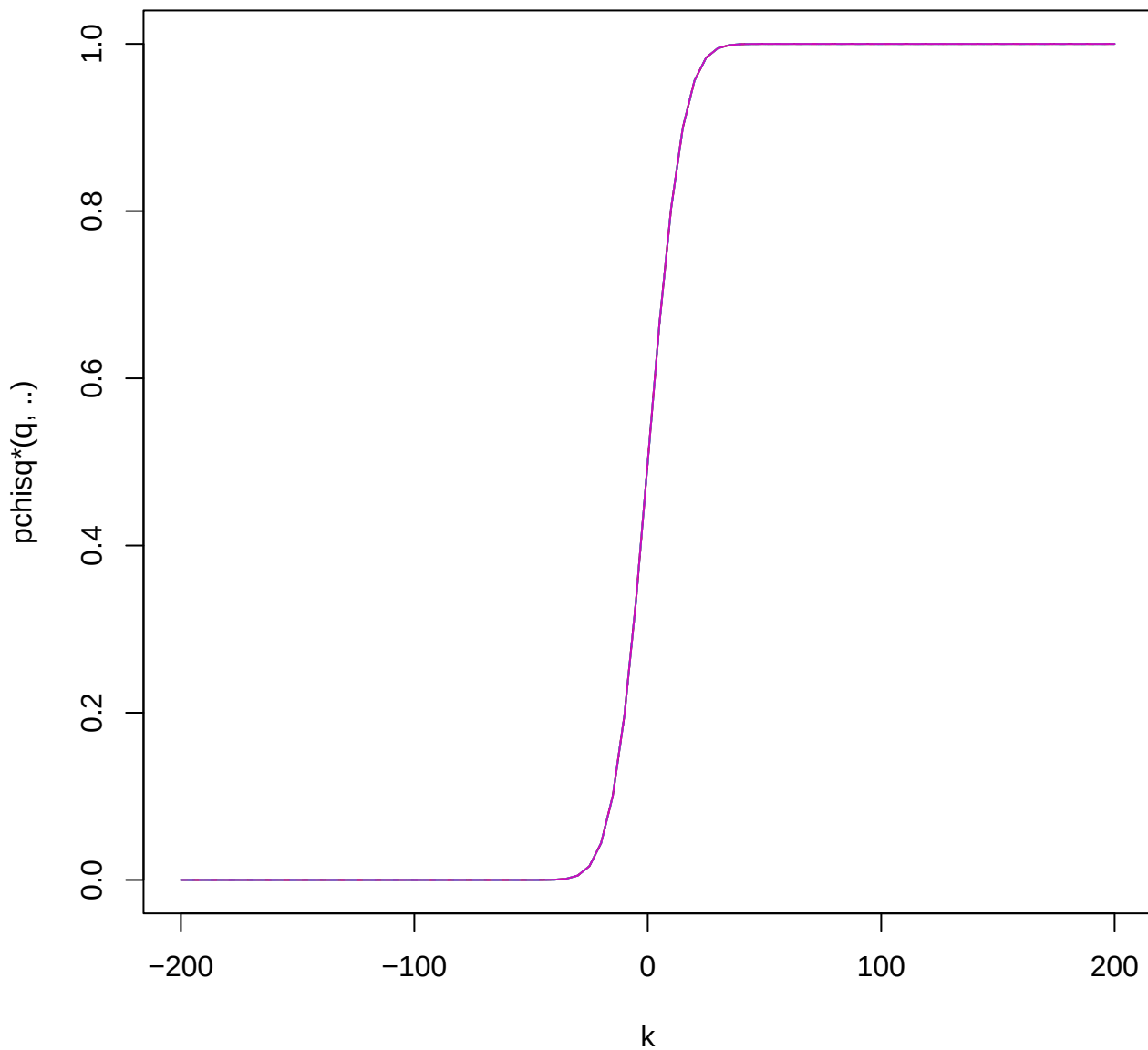
x



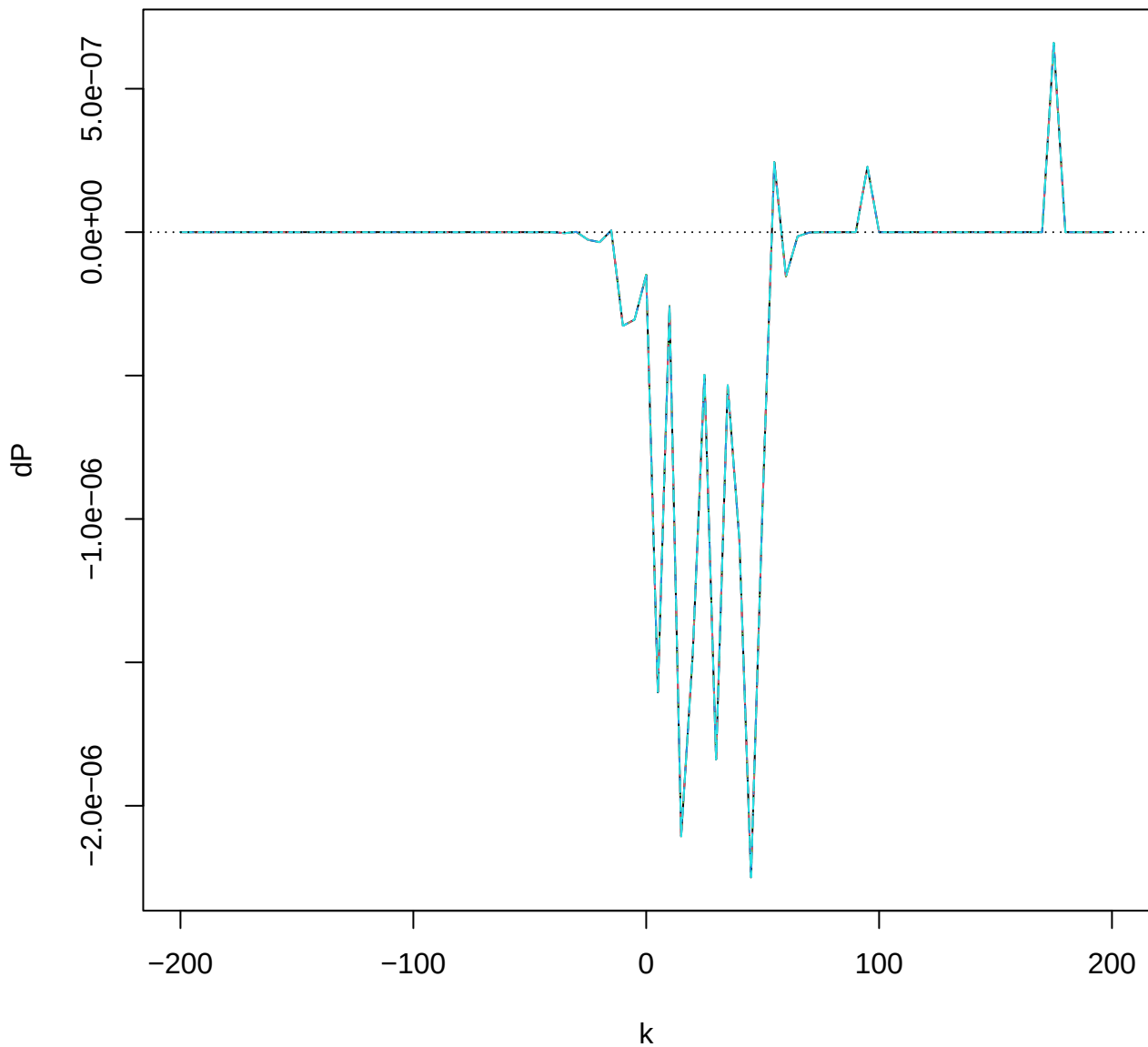
`p1 <- -pchisq(1:400, ncp = 80 * (1 - .Machine$double.eps), log = TRUE)`

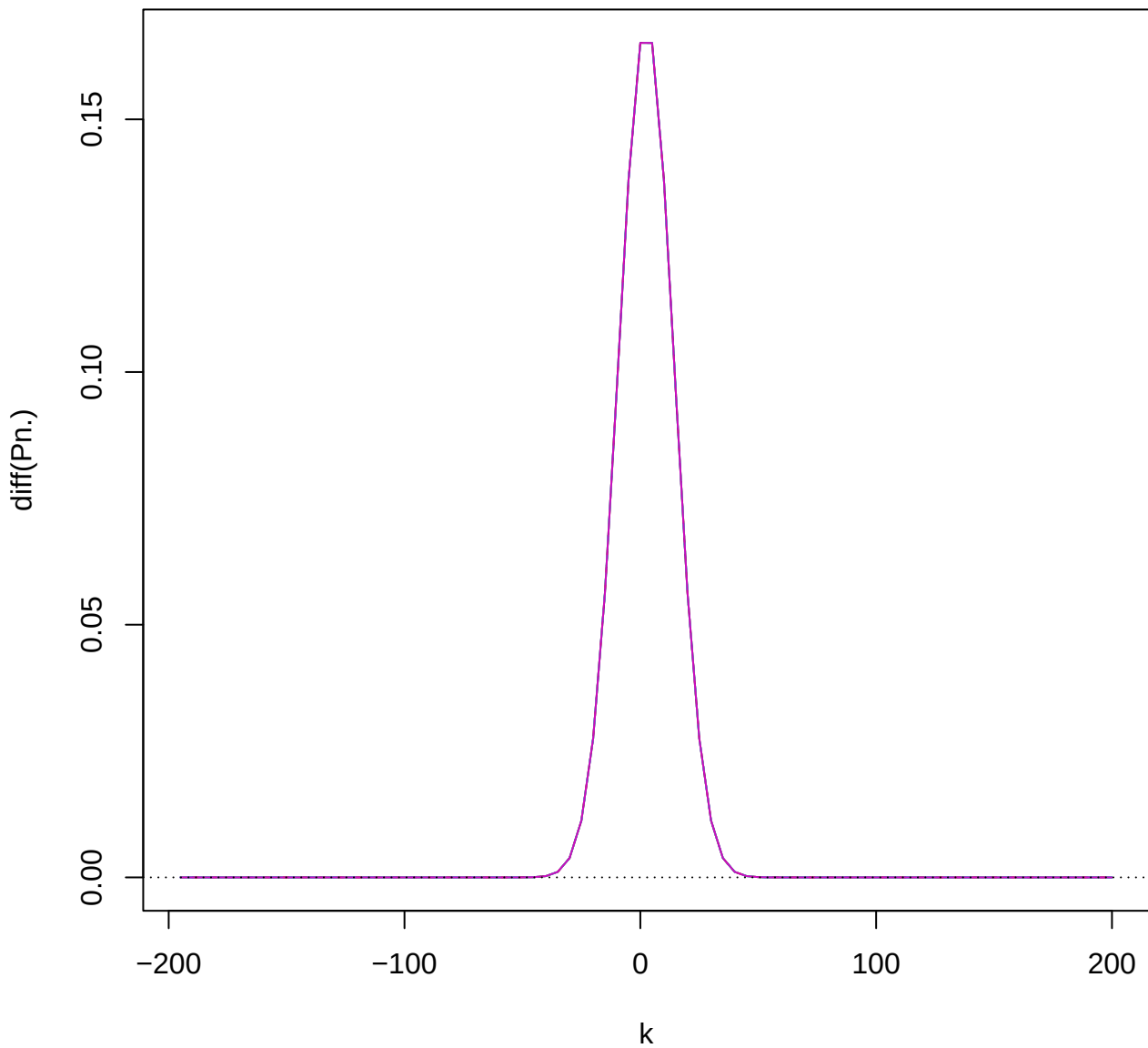


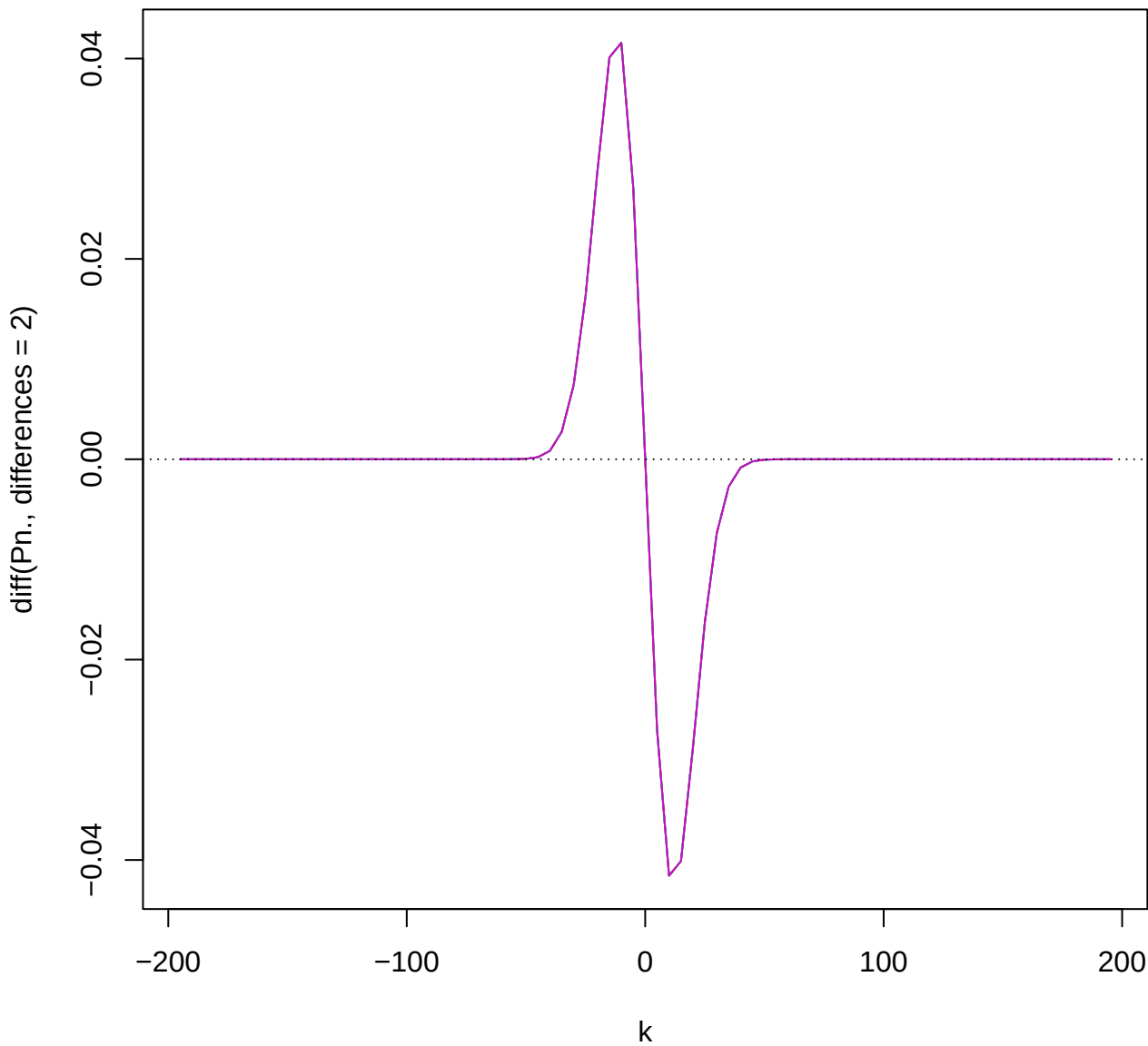
$\text{pchisq}^*(q = \mu(1 + k2^{-18}), df = 1e+09, ncp = 99)$

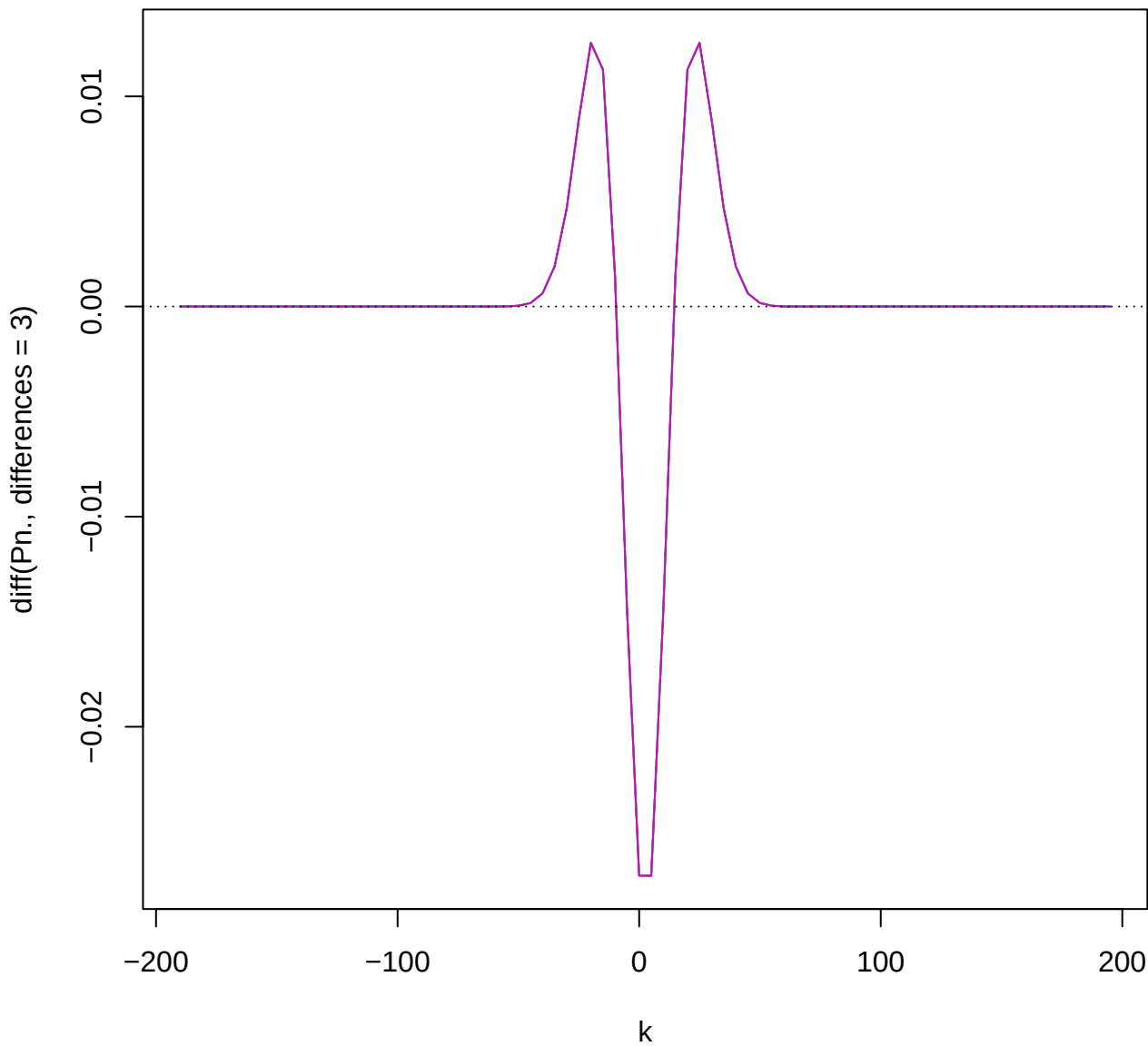


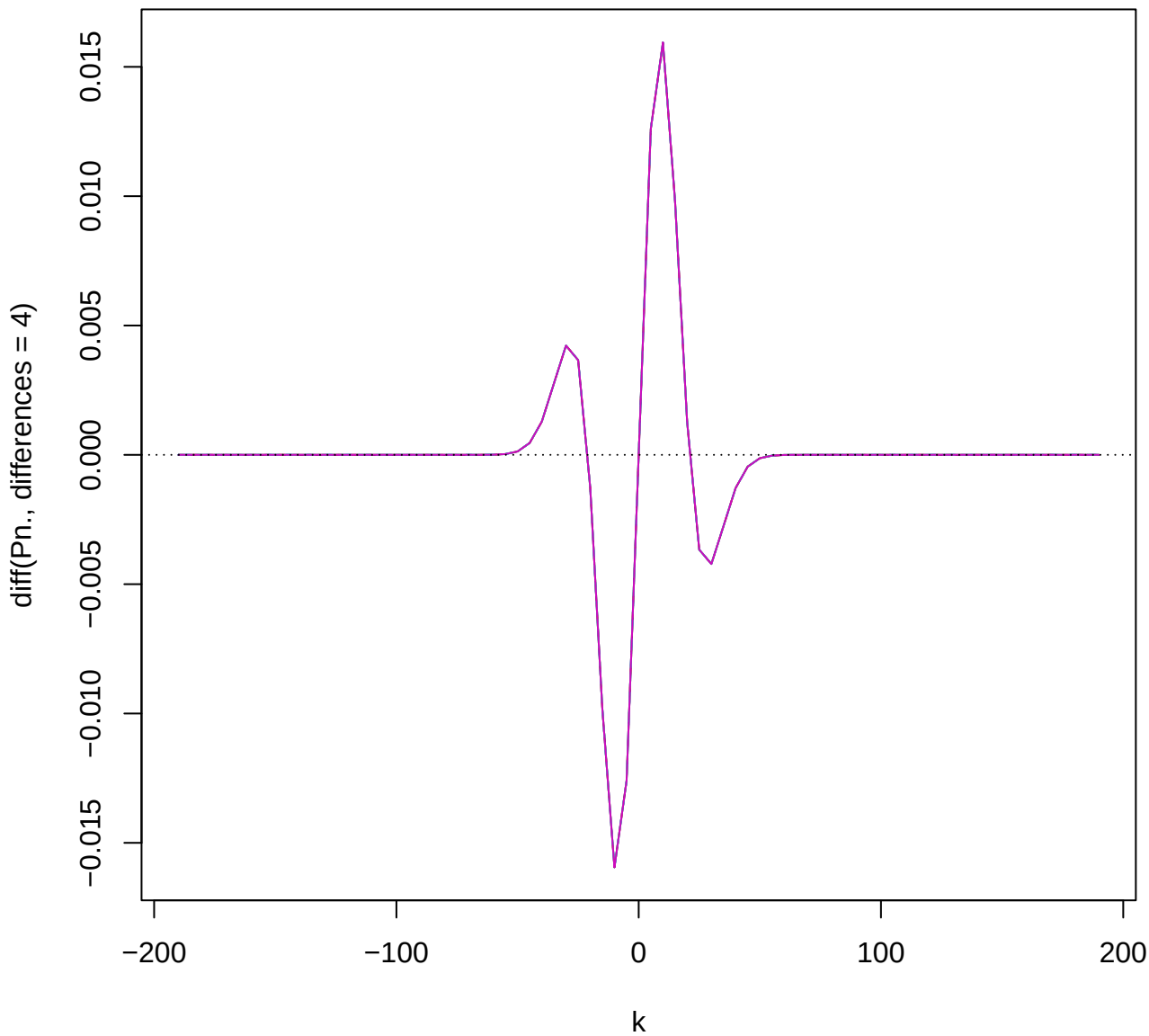
Difference $\text{pchisq}^* - \text{pchisq}(\cdot)$
Difference $\text{list}(q == \mu(1 + k * 2^{-18}), df == 1e+09, ncp == 99) - \text{pchisq}(\cdot)$

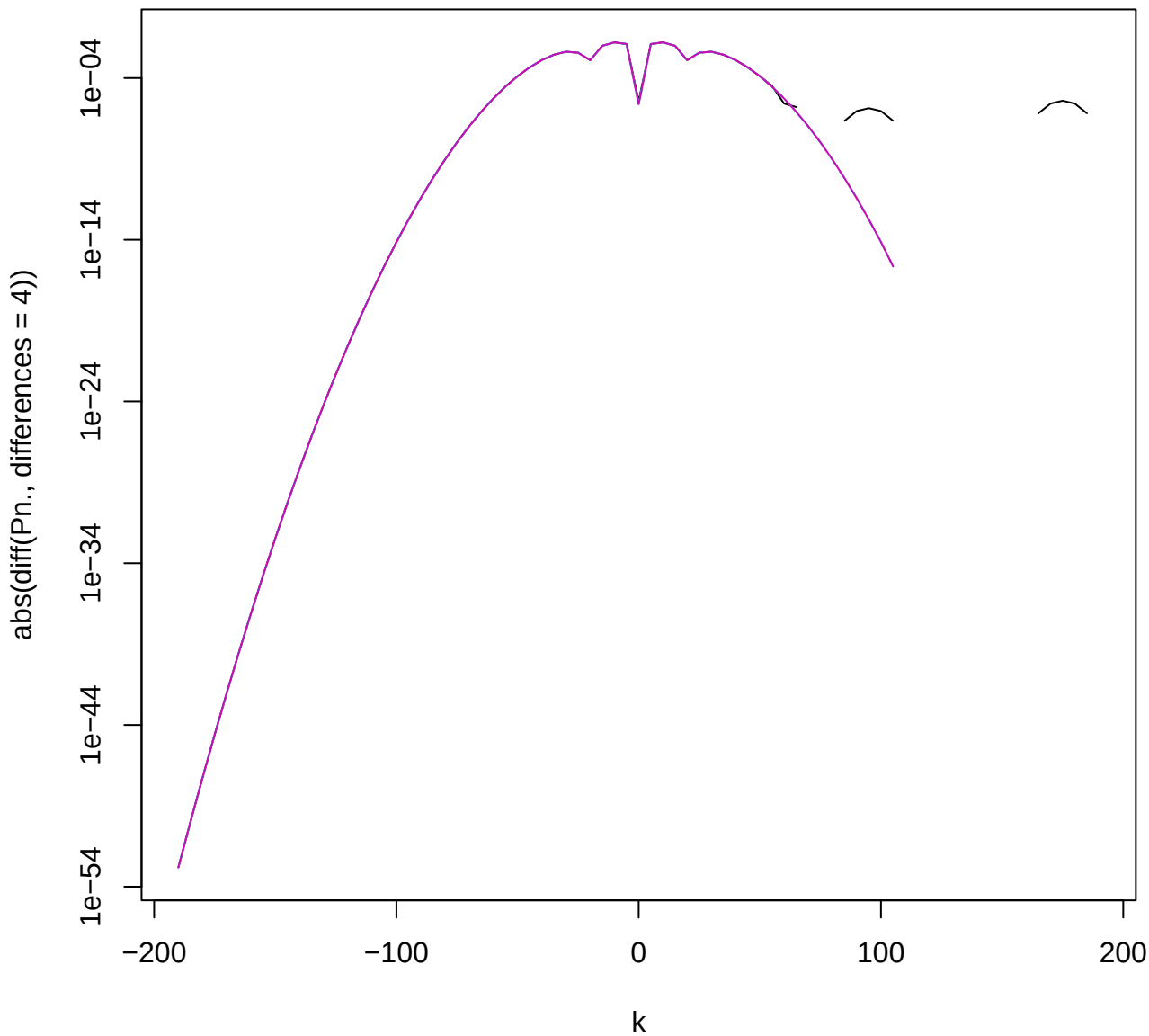




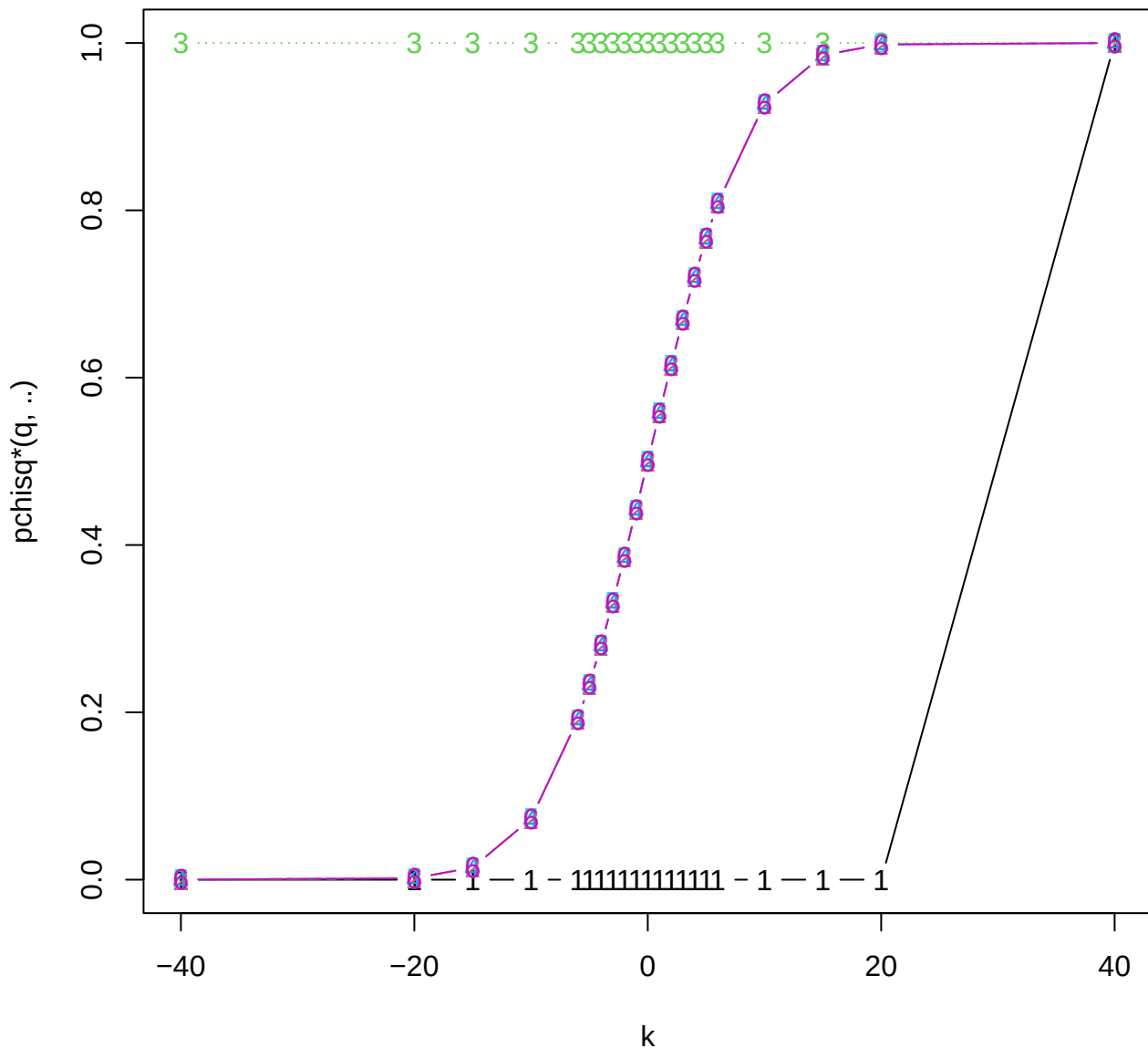




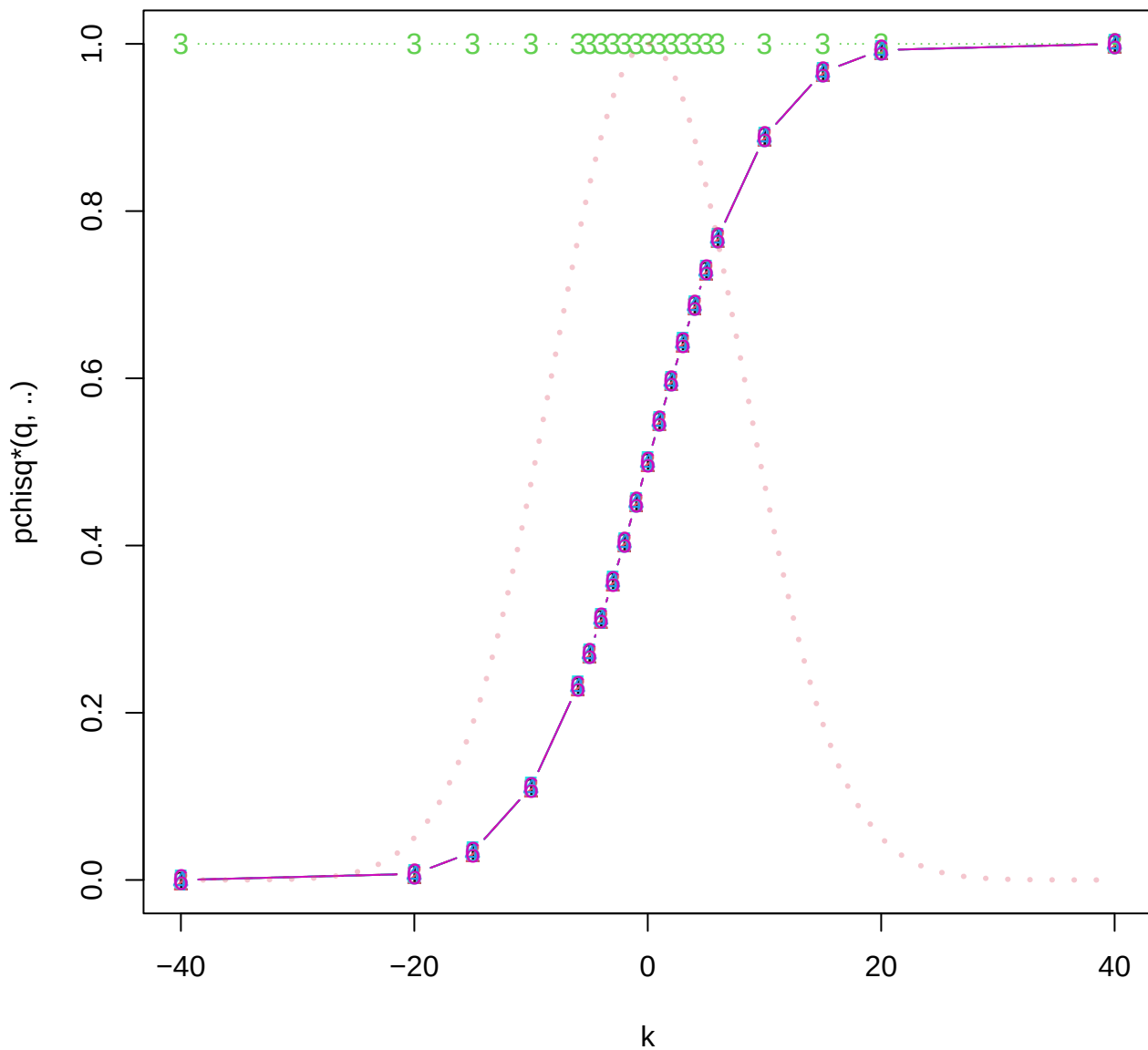




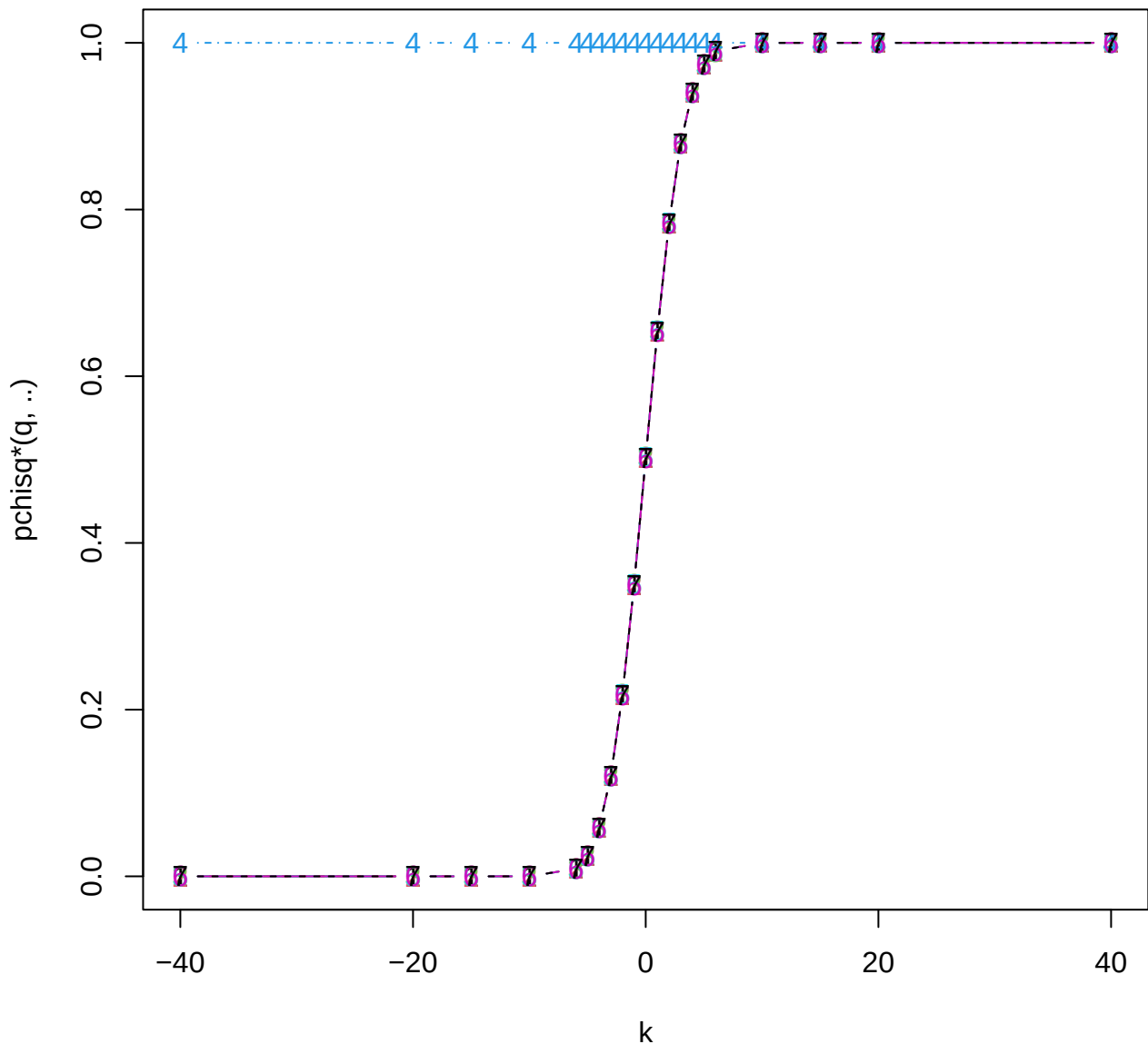
$\text{pchisq}^*(q = \mu(1 + k2^{-35}), \mu = v + \lambda = 99 + 1e+20, df = 99, ncp = 1e+20)$



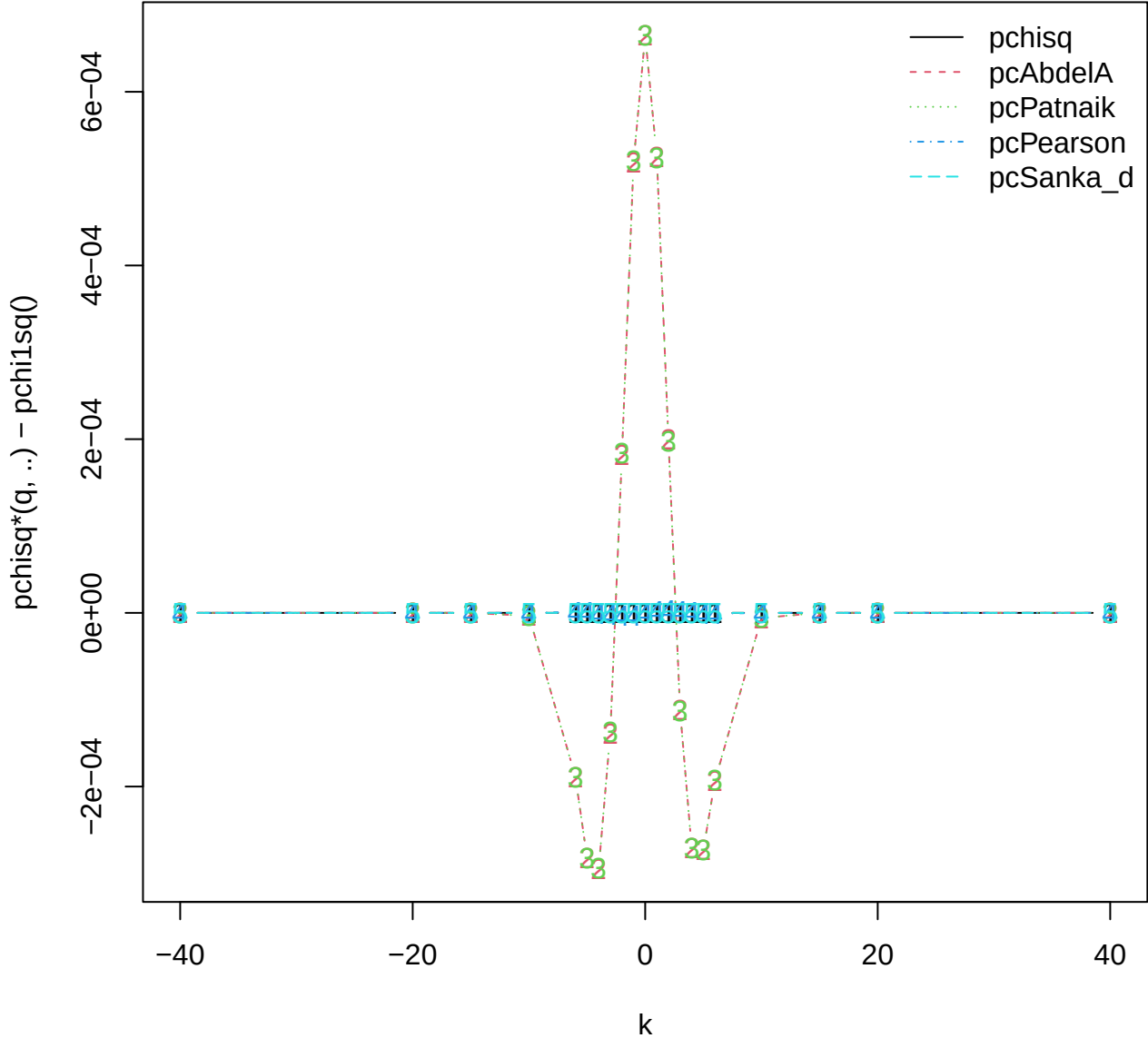
$\text{pchisq}^*(q = \mu(1 + k2^{-12}), \mu = v + \lambda = 99 + 1\text{e}+06, \text{df} = 99, \text{n}cp = 1\text{e}+06)$



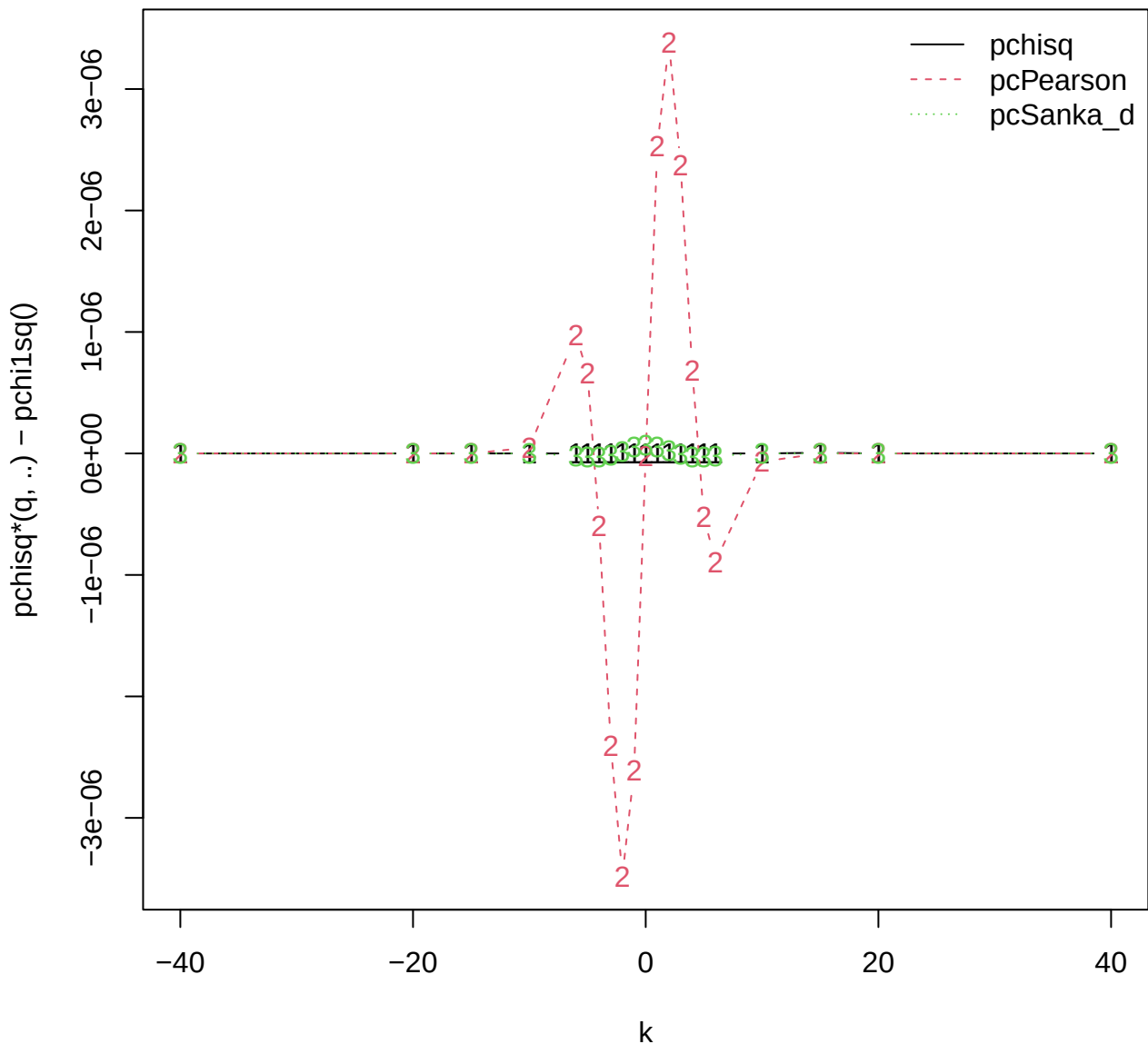
$$\text{pchisq}(q = \mu(1 + k2^{-7}) - \text{pchisq.1}, \mu = v + \lambda = 1 + 10000, \text{df} = 1, \text{ncp} = 10000)$$



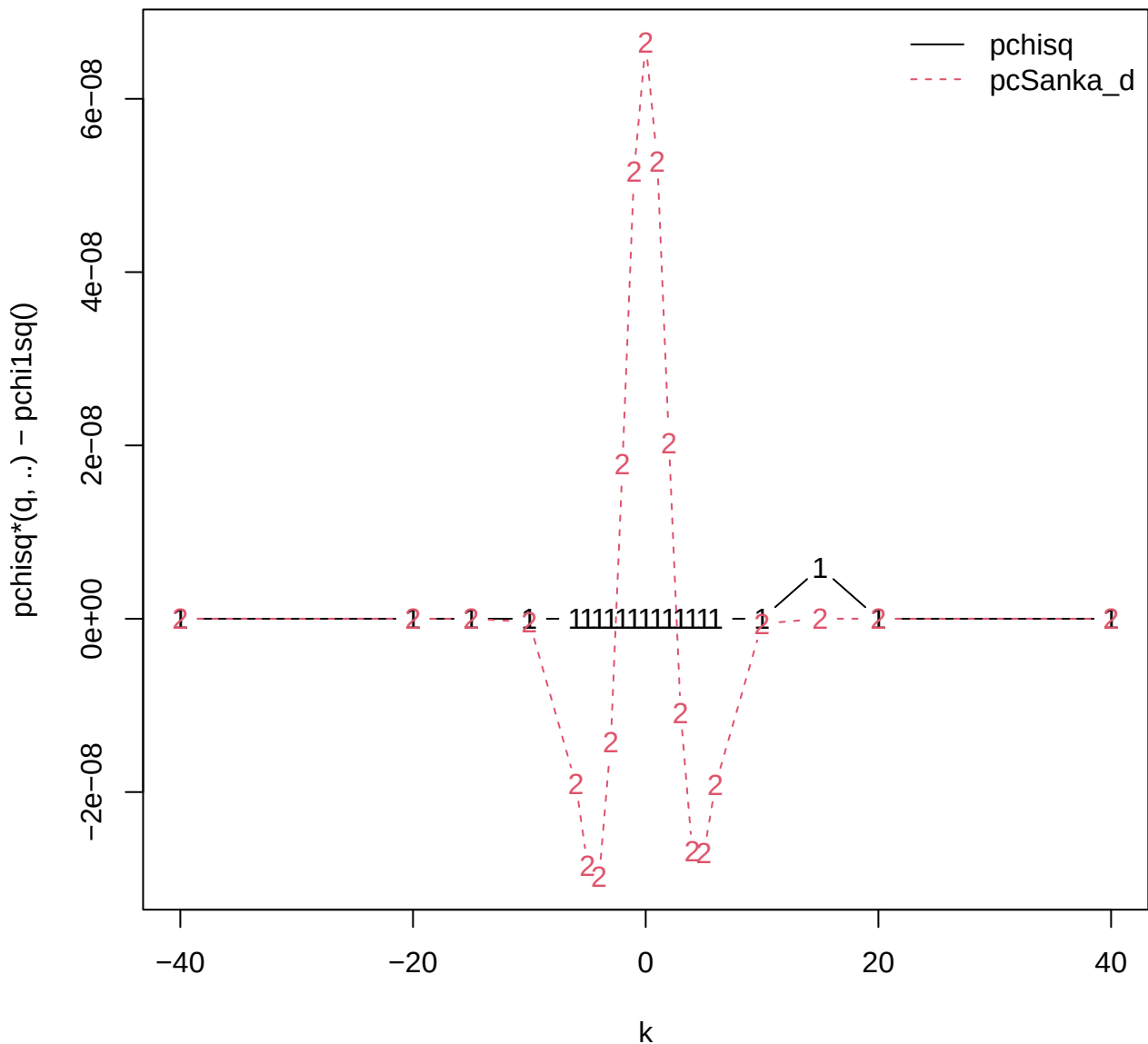
$$pchi^*(q = \mu(1 + k2^{-7}) - pchi.1, \mu = v + \lambda = 1 + 10000, df = 1, ncp = 10000)$$



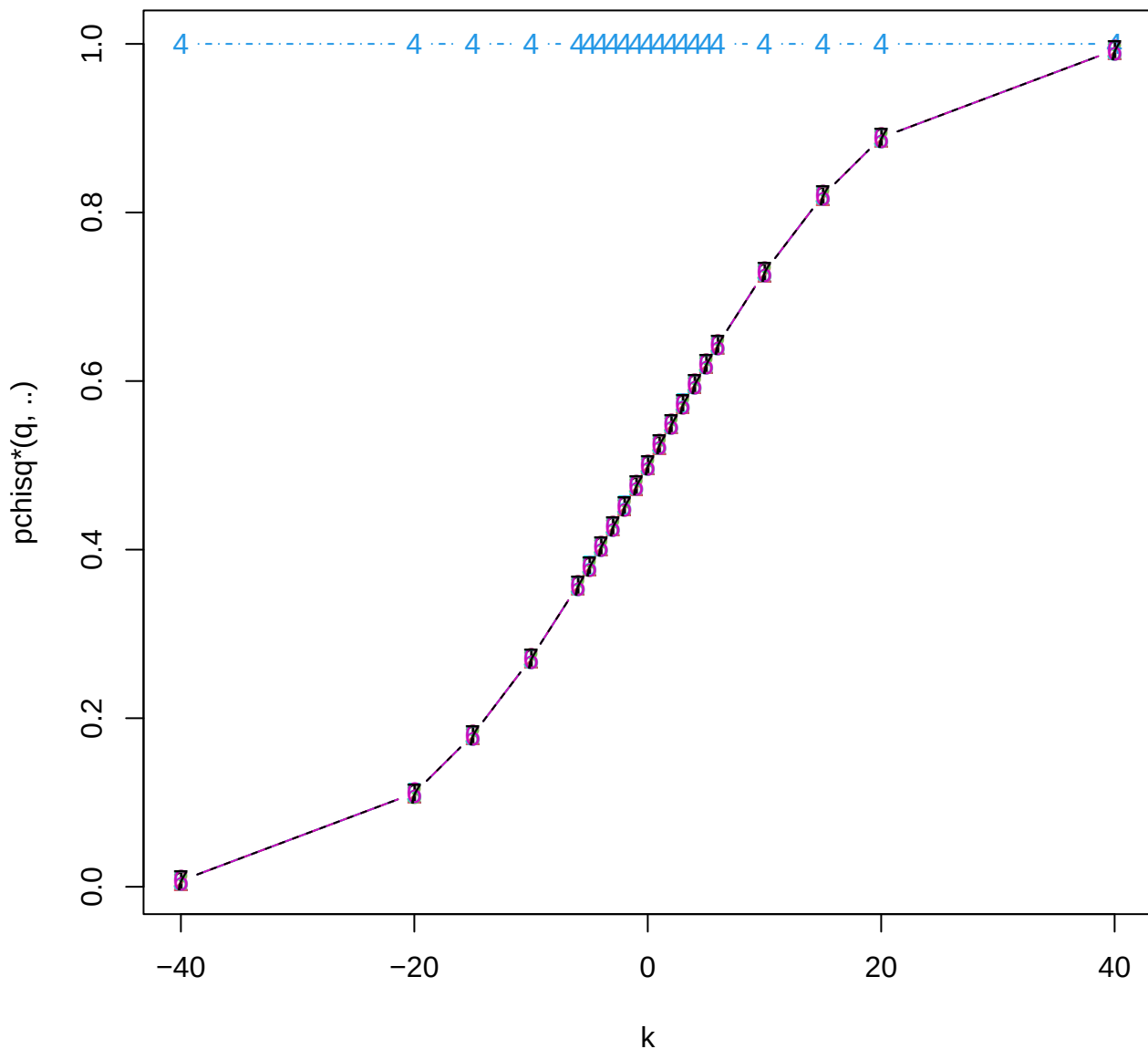
$$\text{pchisq}^*(q = \mu(1 + k2^{-7}) - \text{pchisq}.1, \mu = v + \lambda = 1 + 10000, \text{df} = 1, \text{ncp} = 10000)$$



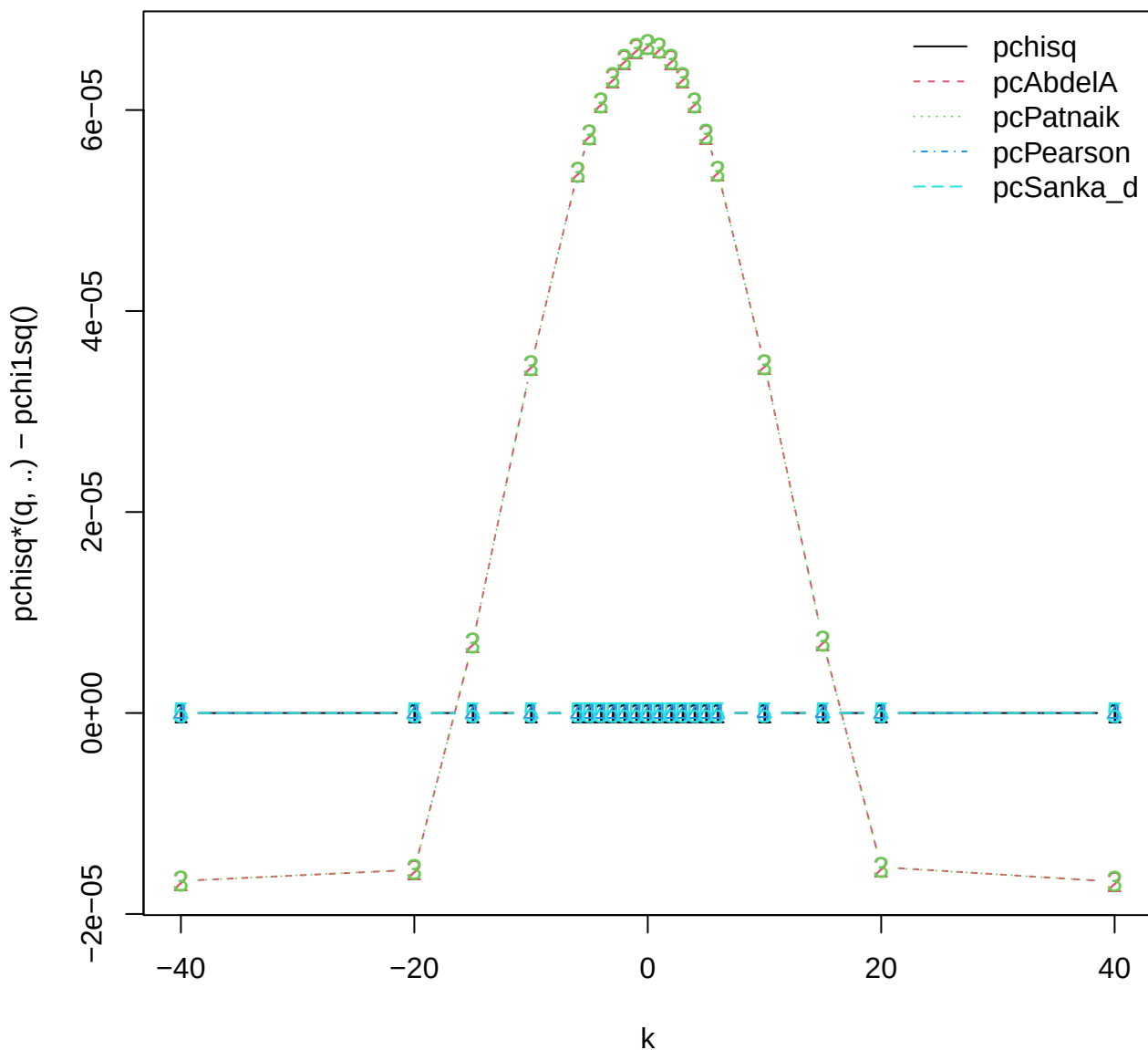
$$pchi^*(q = \mu(1 + k2^{-7}) - pchi.1, \mu = v + \lambda = 1 + 10000, df = 1, ncp = 10000)$$



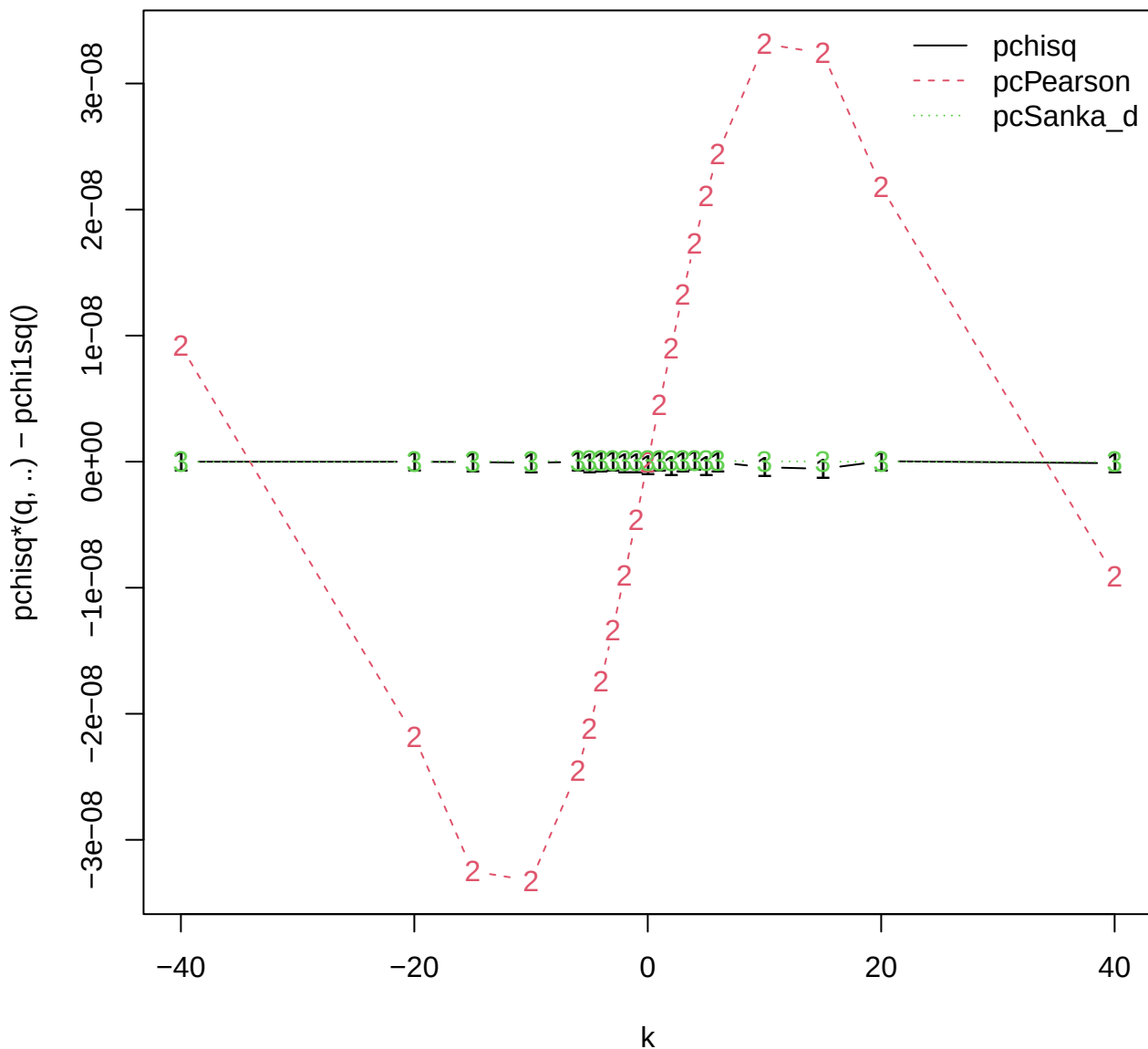
$\text{pchisq}(q = \mu(1 + k^2)^{-13}) - \text{pchisq.1}, \mu = v + \lambda = 1 + 1\text{e}+06, \text{df} = 1, \text{ncp} = 1\text{e}+06$



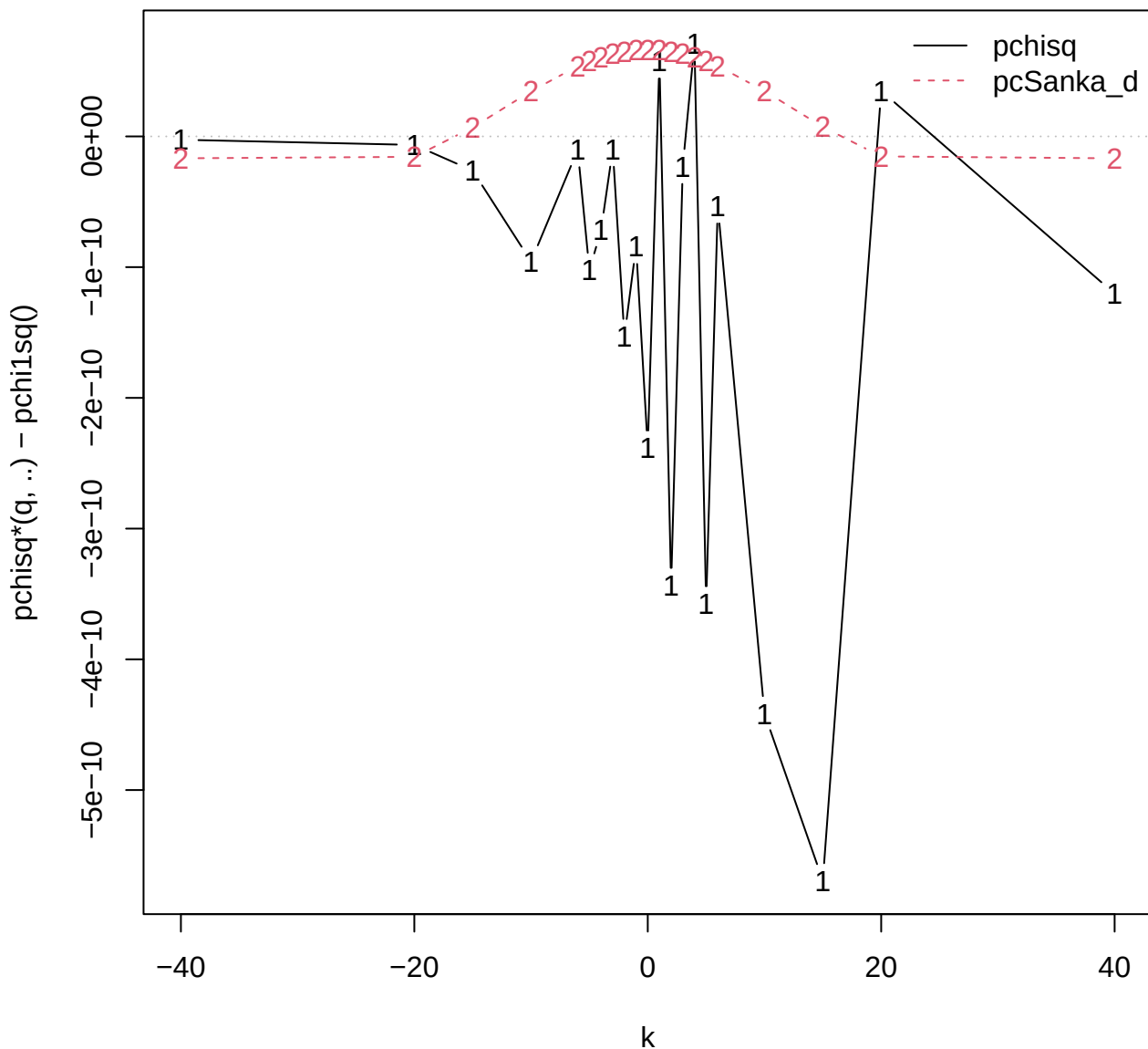
$\text{pchi}^*(q = \mu(1 + k2^{-13}) - \text{pchi.1}, \mu = v + \lambda = 1 + 1\text{e}+06, \text{df} = 1, \text{ncp} = 1\text{e}+06)$



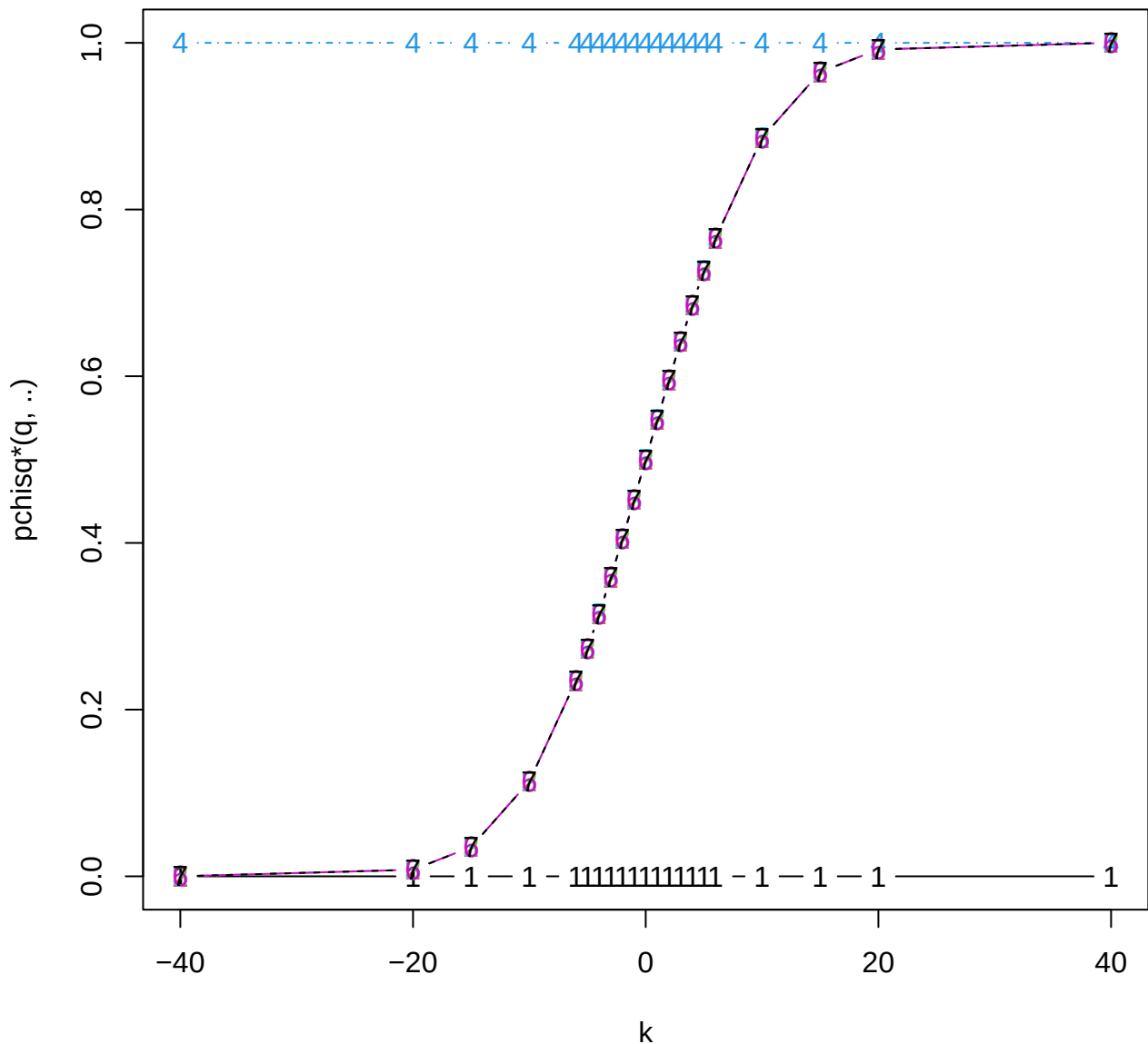
$\text{pchi}^*(q = \mu(1 + k2^{-13}) - \text{pchi.1}, \mu = v + \lambda = 1 + 1\text{e}+06, \text{df} = 1, \text{ncp} = 1\text{e}+06)$



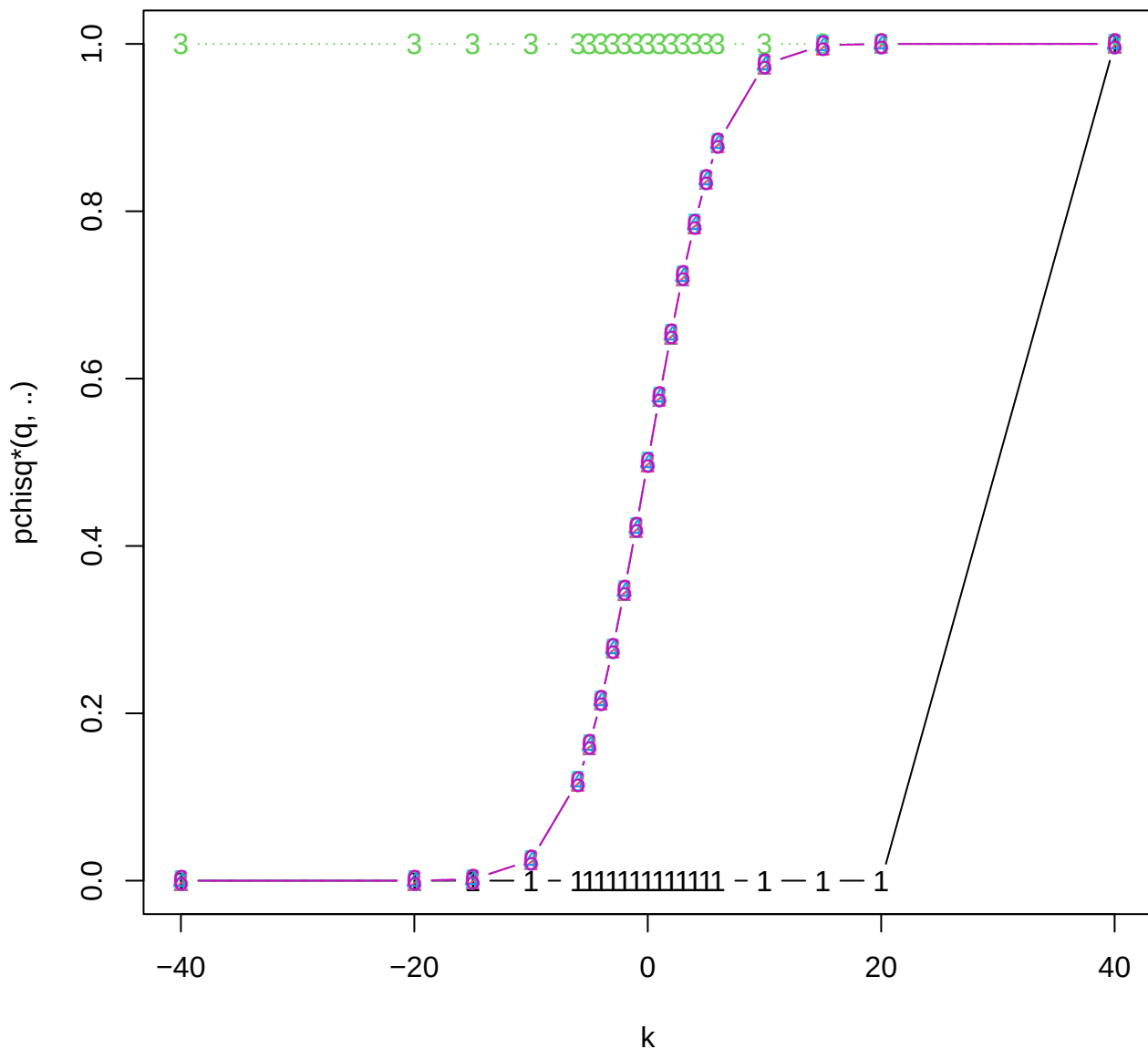
$\text{pchisq}(q = \mu(1 + k2^{-13}) - \text{pchisq}, \mu = v + \lambda = 1 + 1e+06, df = 1, ncp = 1e+06)$



$$\text{pchisq}^*(q = \mu(1 + k2^{-17}), \mu = v + \lambda = 3 + 1\text{e}+09, \text{df} = 3, \text{ncp} = 1\text{e}+09)$$



$\text{pchisq}^*(q = \mu(1 + k2^{-17}), \mu = v + \lambda = 1\text{e}+09 + 1, \text{df} = 1\text{e}+09, \text{ncp/df} = 1)$



$\text{pchisq}^*(q = \mu(1 + k2^{-14}), \mu = v + \lambda = 2\text{e}+06 + 0.5, \text{df} = 2\text{e}+06, \text{ncp}/\text{df} = 0.5)$

