

report24

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simulated data, order = 2

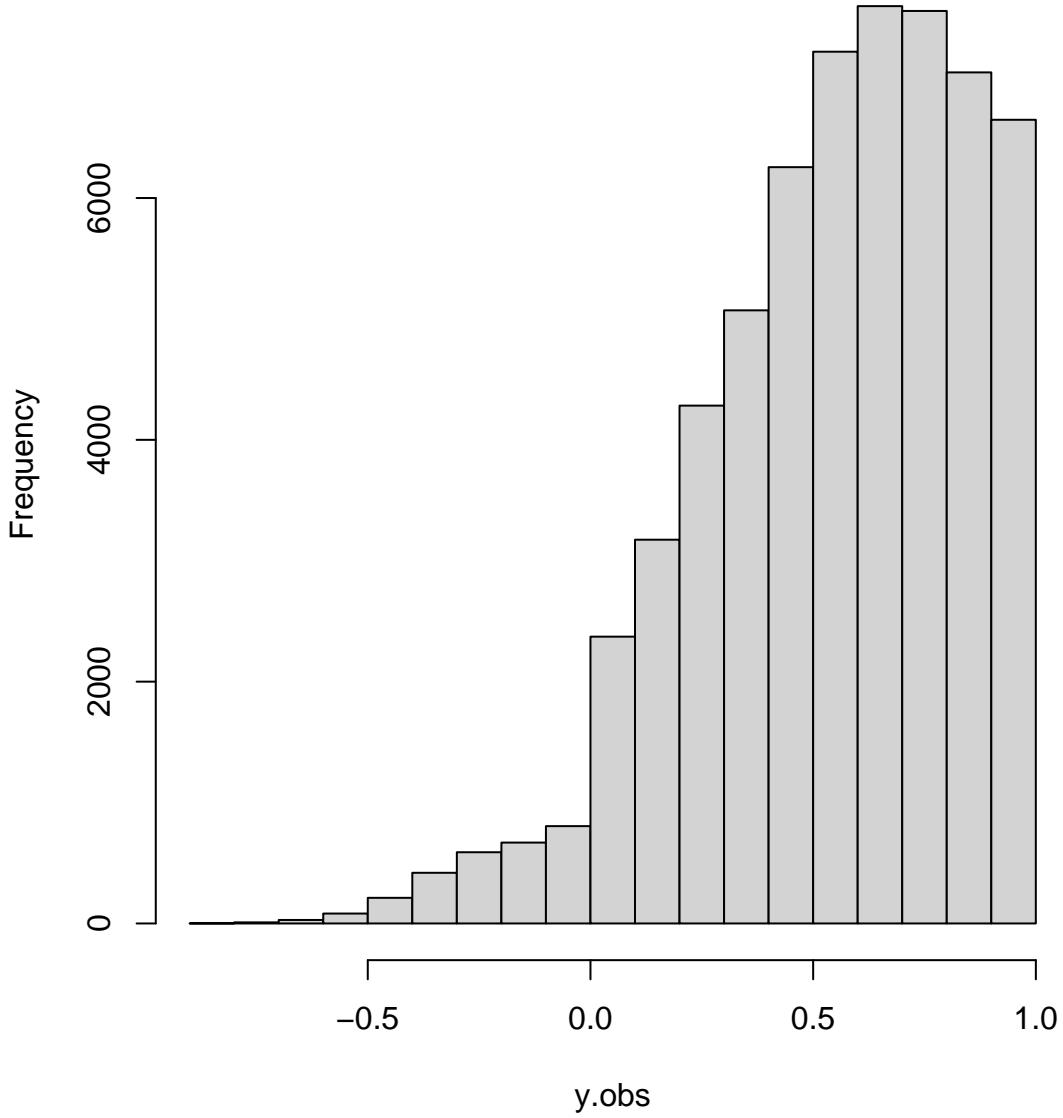
```
N_para <- 6
simulate <- TRUE
## Density regression with jump
if(simulate){
  set.seed(123)
  p <- 2
  n.obs <- 6e4
  b0x <- cbind(b0, threshold(rt(order, df=6), 1))
  while(ncol(b0x) < p) b0x <- cbind(b0x, 0)
  a0 <- c(1, 4, rep(0, p-2))
  shapes0 <- c(4,1)
  pers0 <- 1/2
  jbw0 <- 0.16*2*pers0
  pos.synth <- TRUE
  pos.est <- TRUE

  x.obs <- cbind(1, matrix(rnorm(n.obs*(p-1)), n.obs, p-1))
  y.obs <- simulate.fx(n.obs, b0x, x.obs, a0, shapes0, jbw0, positive=pos.synth)
}

N_para <- 6
set.seed(123)
b_init <- replicate(N_para, matrix(rnorm(n = order*p, sd = 3), order, p))
a_init <- replicate(N_para, rnorm(n = p, sd = 3))

hist(y.obs)
```

Histogram of y.obs



no trimming

```
set.seed(123)
order <- 2
b_init <- replicate(N_para, matrix(rnorm(n = order*p, sd=1), order, p))
a_init <- replicate(N_para, rnorm(n = p, sd = 1.5))

sim_notrim_order2 <- foreach(i = 1:N_para) %dorng%
  bdregjump_adapt_poly_trim_alphanoPG(y=y.obs, x=x.obs,
                                         b=b_init[,,i], burn=15000, nsamp=10000,
                                         thin=1, trim = 1, order = 2,
```

```
                jump=list(a=a_init[,i], prec = 1, positive=pos.est,
                           persistence=0.5, update.jbw=TRUE))

load("./report/report24/sim_notrim_order2.RData")

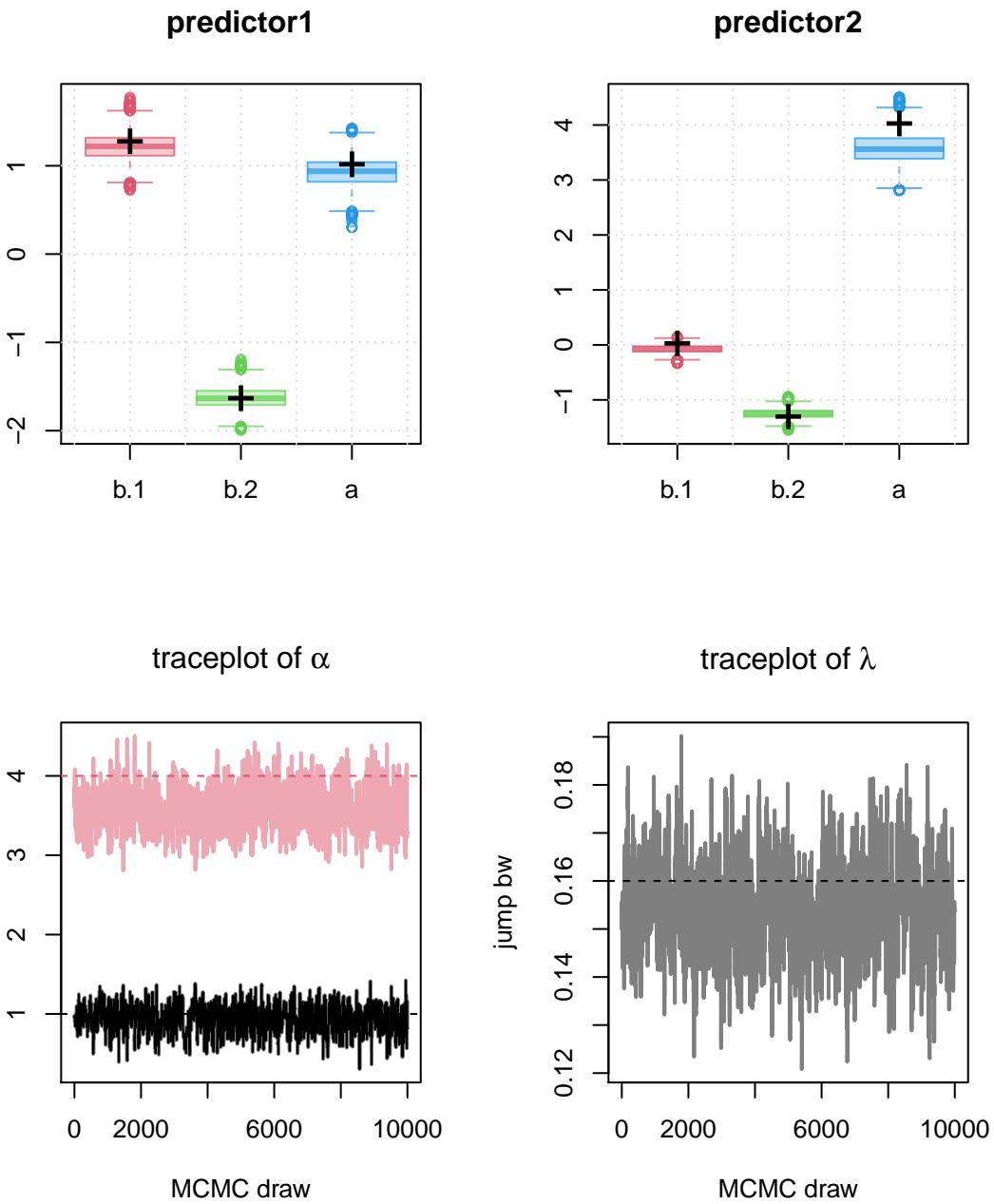
sim_notrim_order2[[1]]$shapes[,10000]

## [1] 4.283868 1.038746

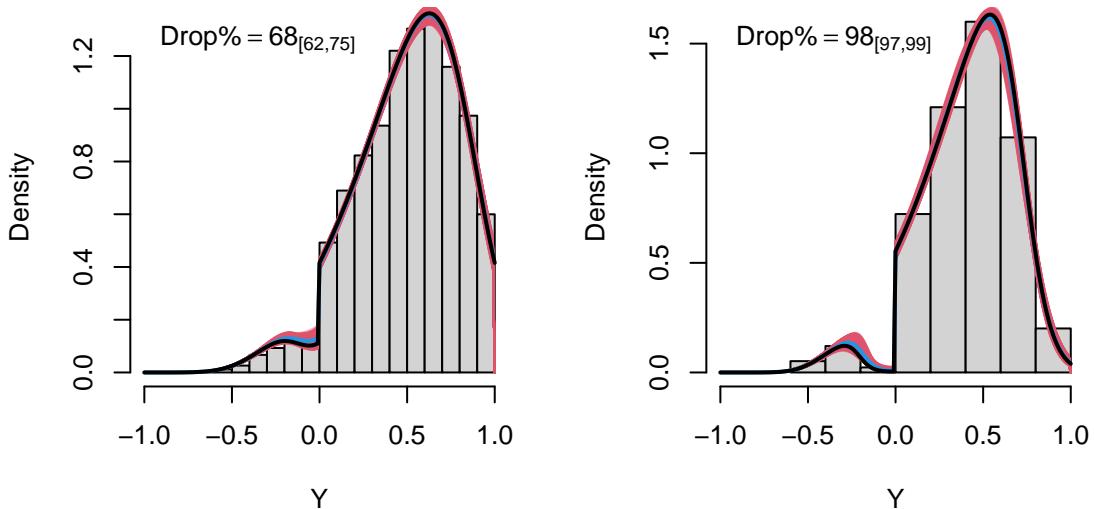
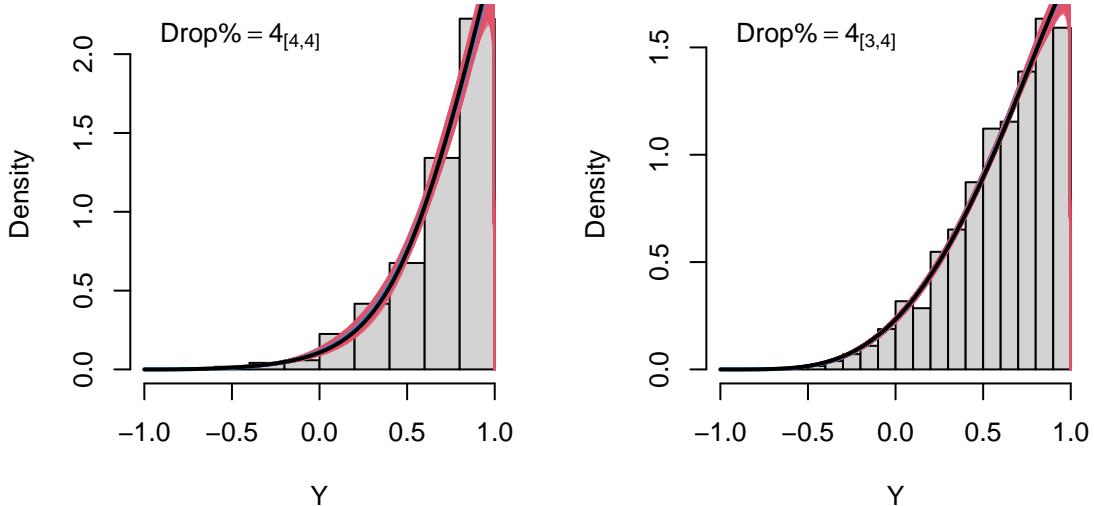
sim_notrim_order2_coda <- multi_chain_coda(sim_notrim_order2,
                                              burn = 15000, N_para, p, order = 2)

get.result.bdregjump(sim_notrim_order2[[1]], x.obs, y.obs, b0x, a0)

## Runtime 2945 seconds
```



```
## Estimated jump persistence (true= 0.5 )
## 0.42 0.46 0.48 0.5 0.54
```



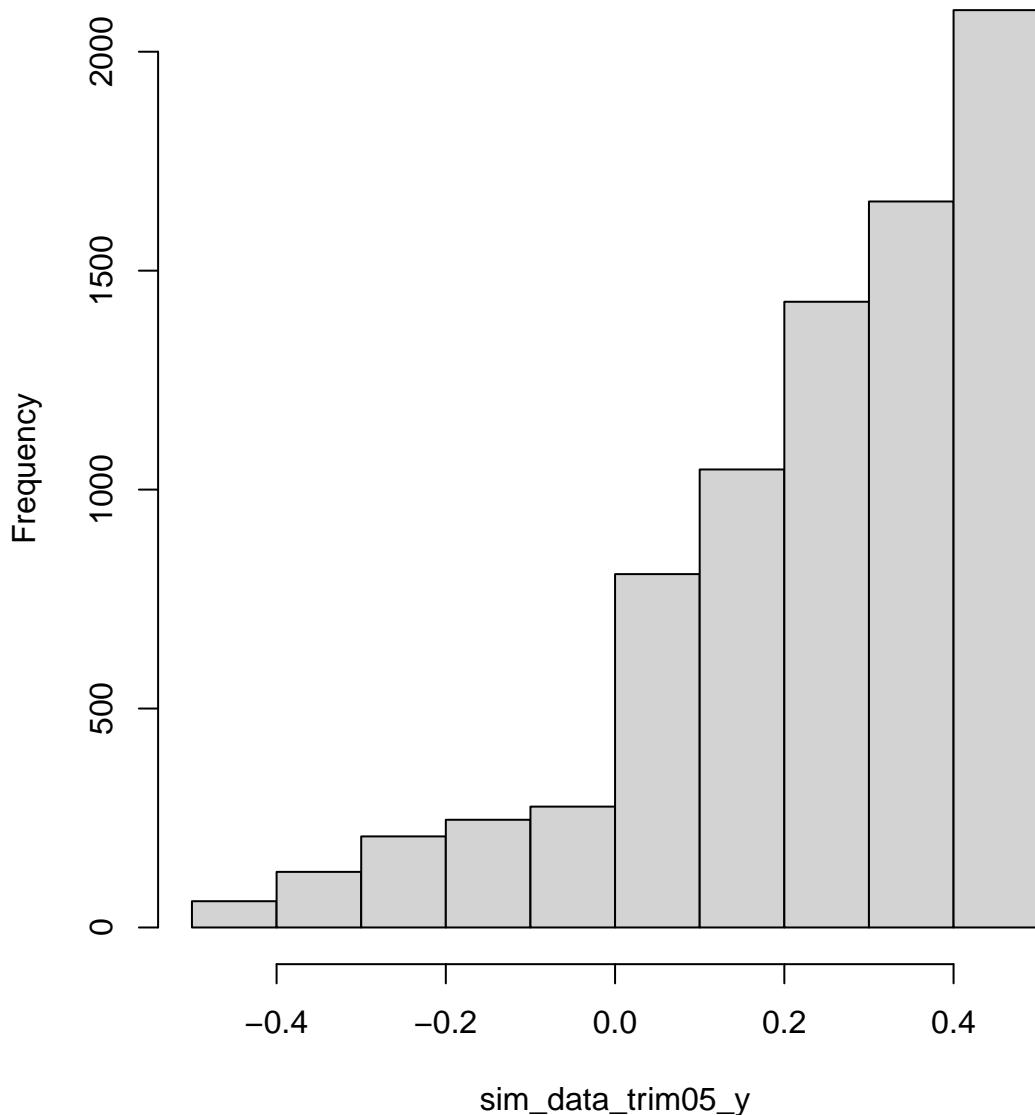
```
## accperatnce rate: 23 59 %
```

trimming = 0.5

```
trim05_ind <- (abs(y.obs) < 0.5)
sim_data_trim05_y <- y.obs[trim05_ind]
sim_data_trim05_x <- x.obs[trim05_ind,]
```

```
hist(sim_data_trim05_y)
```

Histogram of sim_data_trim05_y



```
i <- 1
sim_trim05_order2_i1_shapeadapt22 <- bdregjump_adapt_poly_trim_alphaPG_shapeadapt(y=sim_data_trim05_y,
order = 2, jump=list(a=a_init[,i], prec = 1, positive=pos.est, persistence=0.5, update.jbw=TRUE),
print.process = TRUE)

load("./report/report24/sim_trim05_order2_i1_shapeadapt22.RData")

sim_trim05_order2_i1_shapeadapt22$shapes[,10000]

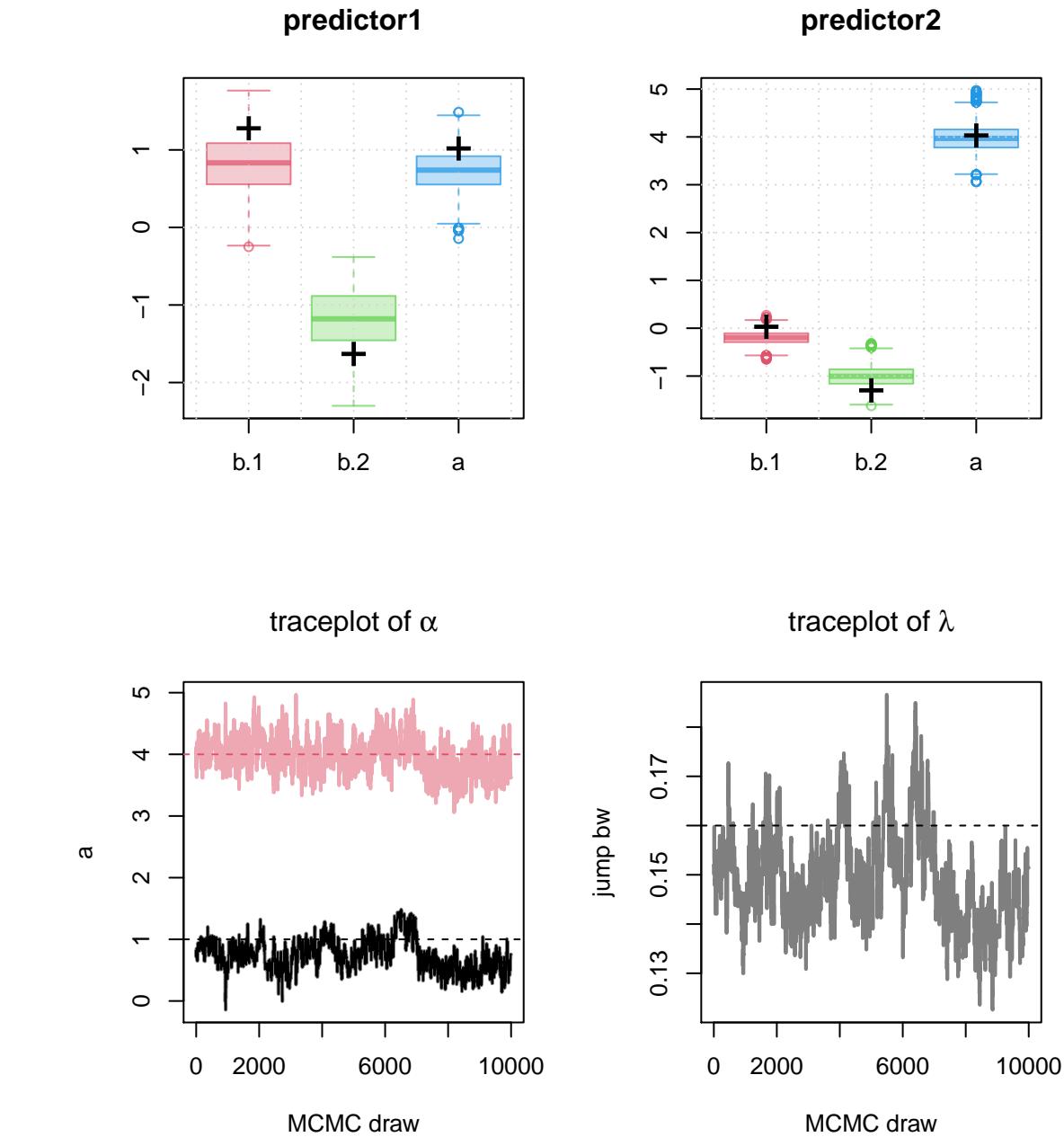
## [1] 4.131409 1.009781
```

```

set.seed(123)
get.result.bdregjump(sim_trim05_order2_i1_shapeadapt22,
                      sim_data_trim05_x, sim_data_trim05_y, b0x, a0,
                      trim=0.5)

```

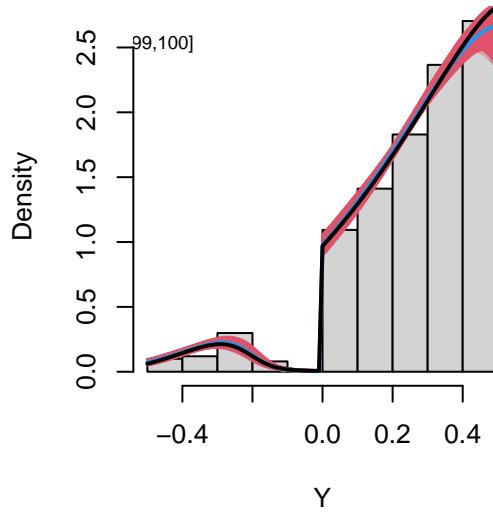
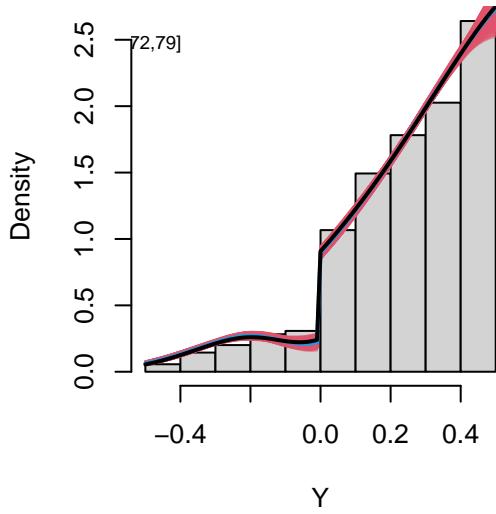
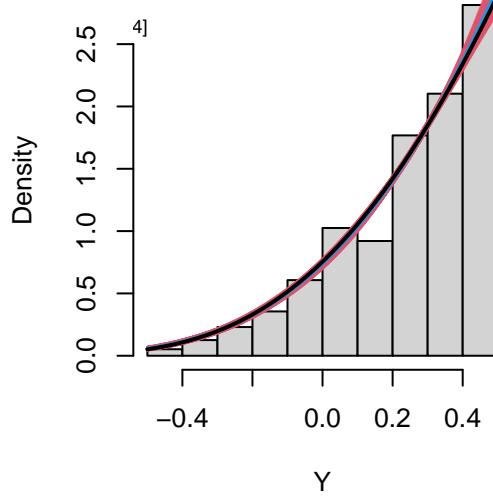
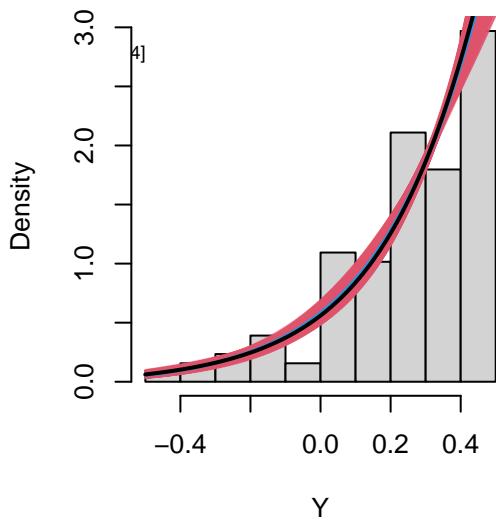
Runtime 4296 seconds



```

## Estimated jump persistence (true= 0.5 )
## 0.42 0.44 0.46 0.48 0.53

```



acceptance rate: 22 22 %