

Оценка пространственной модели по российским данным

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Подгружаем пакеты:

```
library("ggplot2")
library("knitr")
library("MCMCpack")
library("pander")
library("dplyr")
library("MHadaptive")
library("mvtnorm")
library("psych")
library("pander")
library("knitr")
library("lme4")

library("microbenchmark") # test speed of various approaches
```

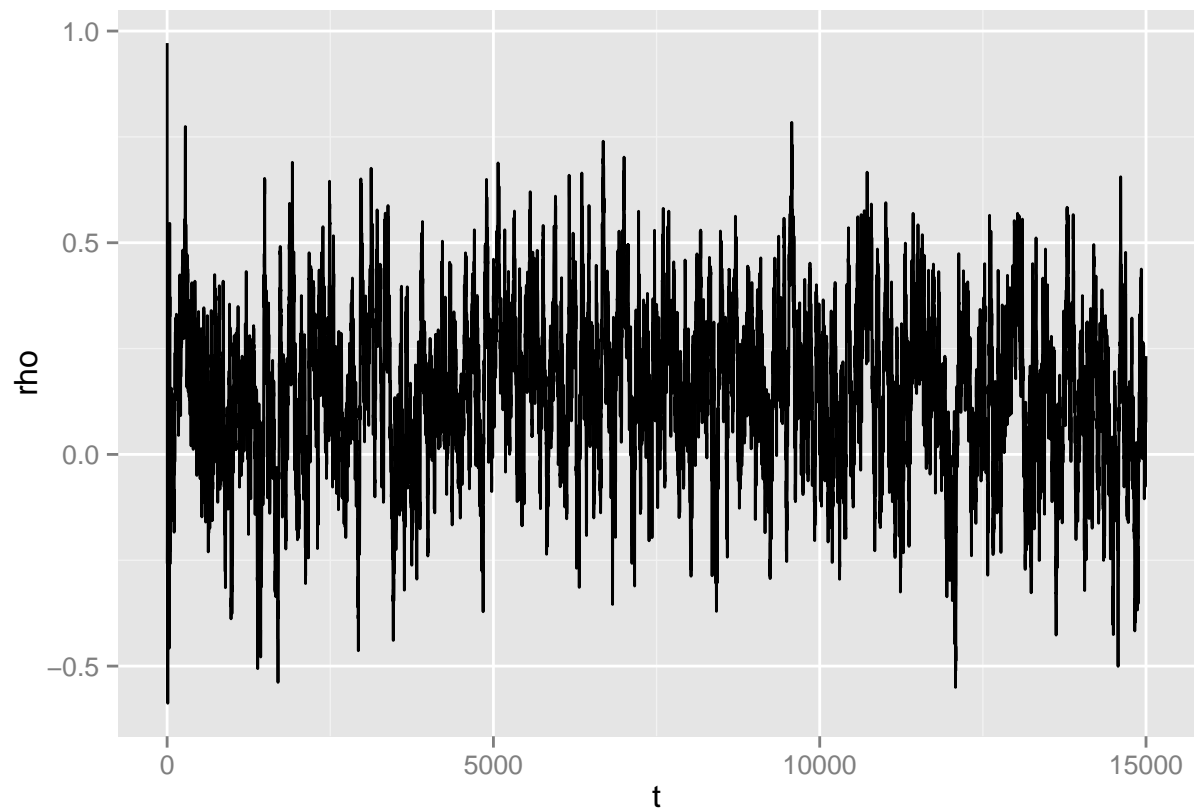
Загружаем результаты симуляций:

```
pars <- readRDS("./estimation/pars_chain.Rds")
pars <- as.data.frame(pars)
# pars <- dplyr::filter(pars, q>0) # was ist das?

n_sim_done <- nrow(pars)
pars <- mutate(pars, t = 1:n_sim_done)
```

Всего было 15000 симуляций. График для ρ весь:

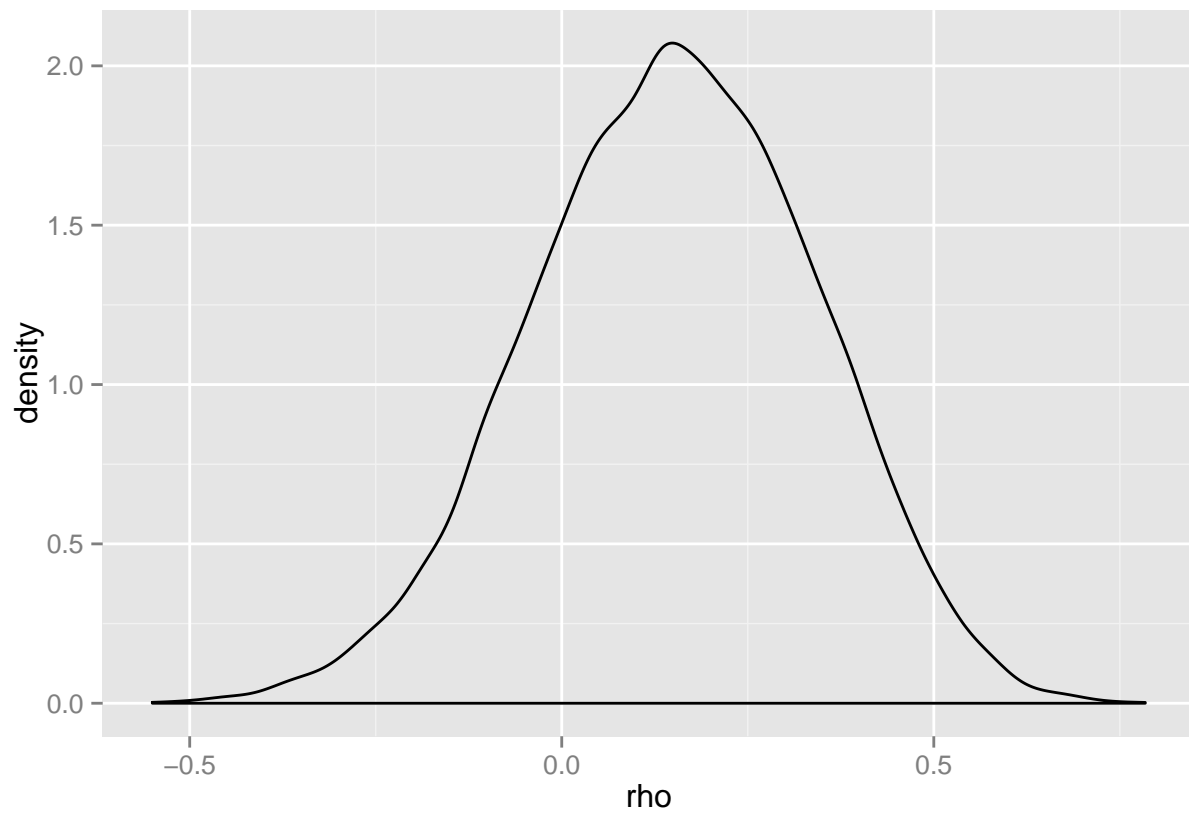
```
qplot(data=pars, t, rho, geom="line")
```



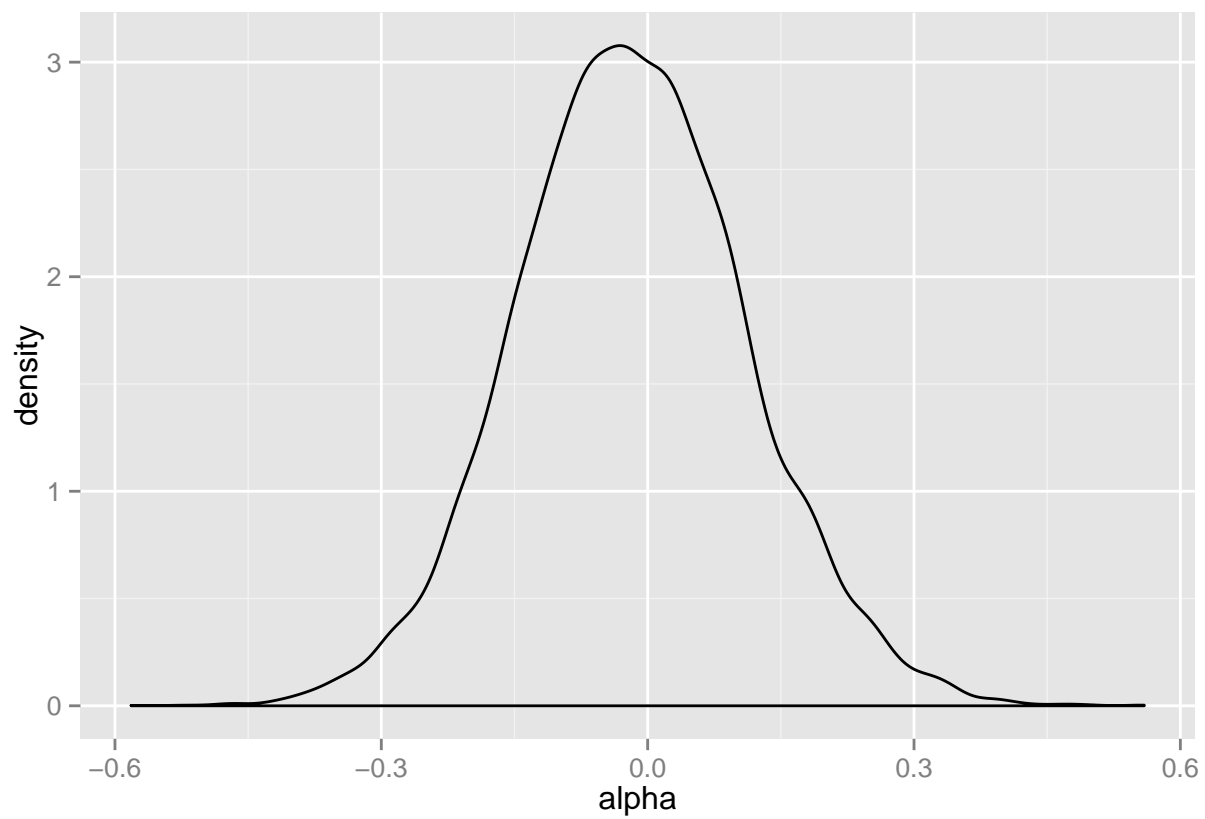
Отберем с 100-го наблюдения:

```
pars <- dplyr::filter(pars, t>100)
```

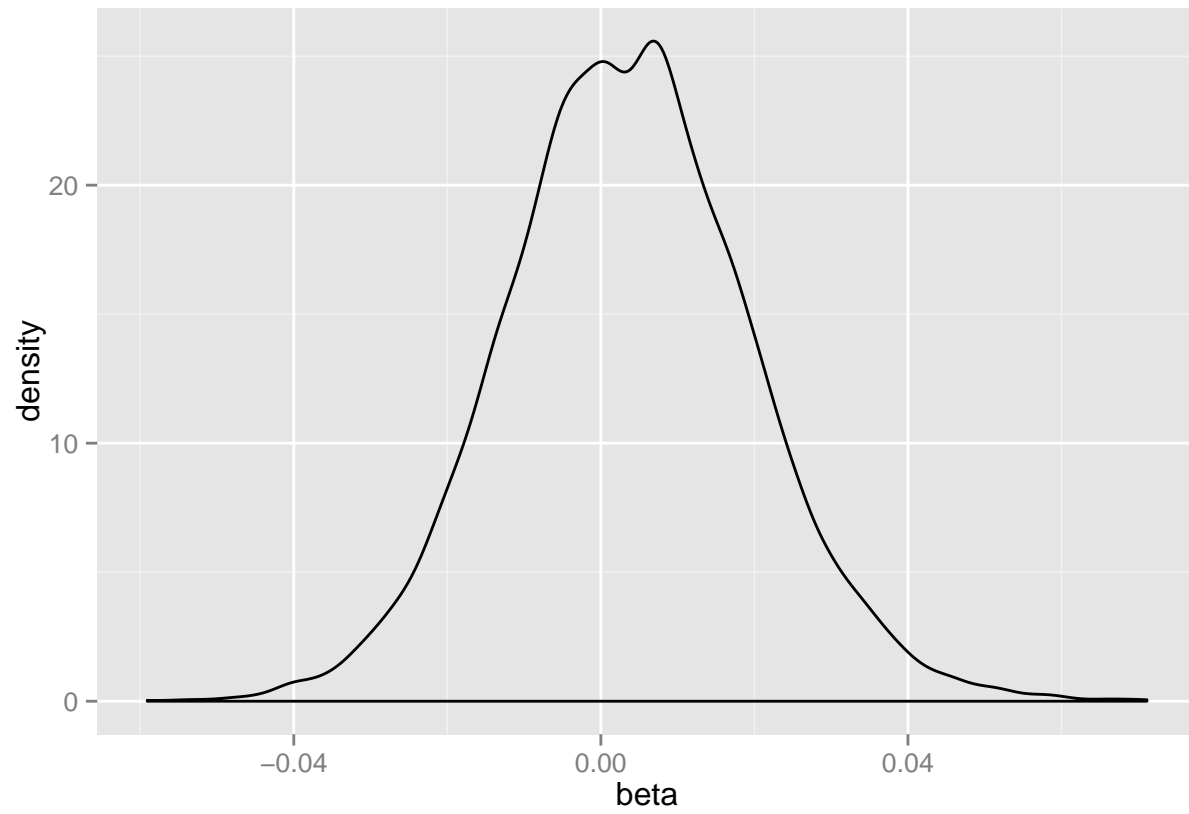
```
qplot(data=pars, rho, geom="density")
```



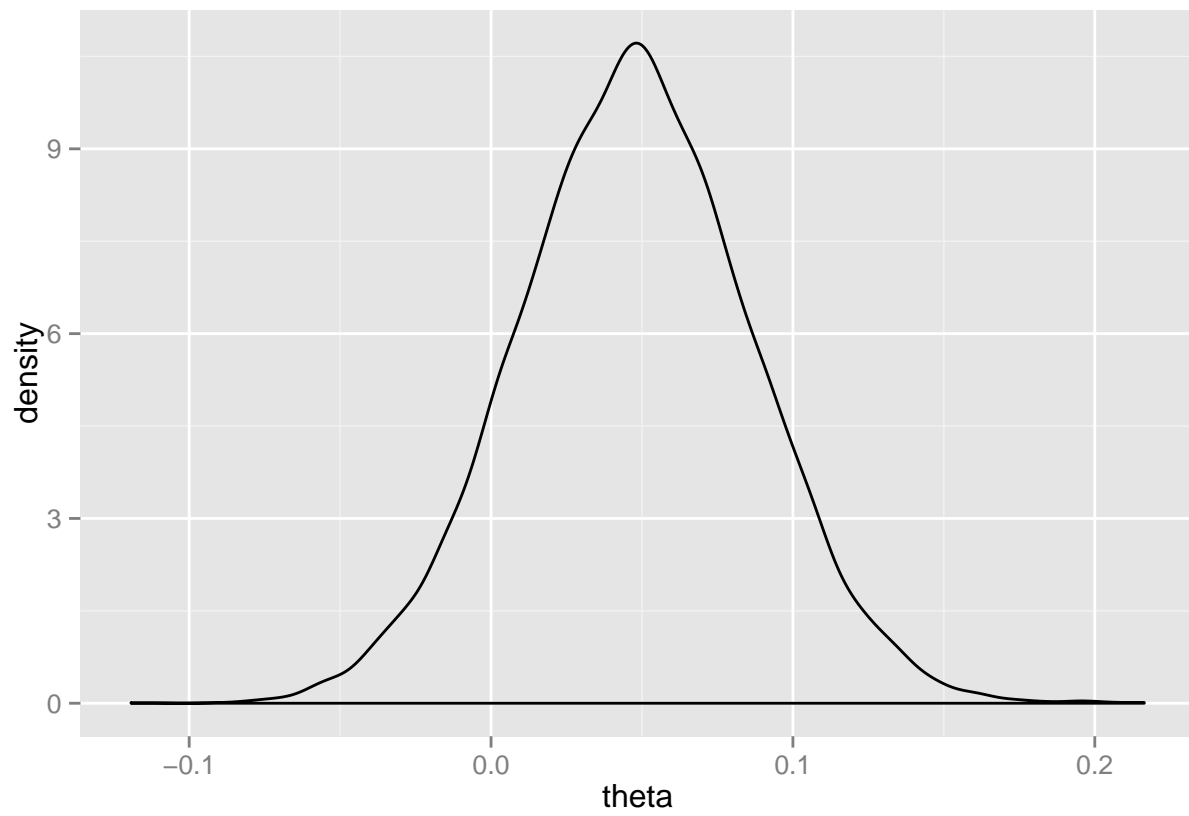
```
qplot(data=pars, alpha, geom="density")
```



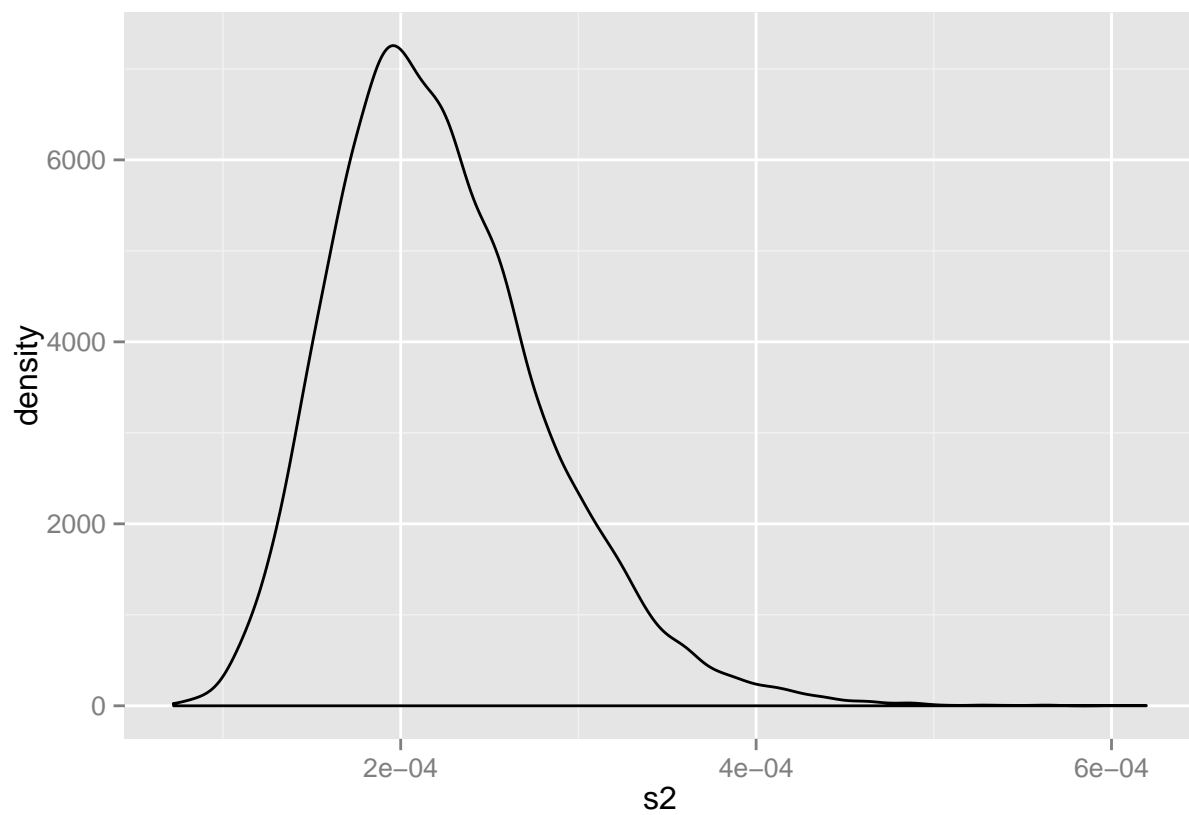
```
qplot(data=pars, beta, geom="density")
```



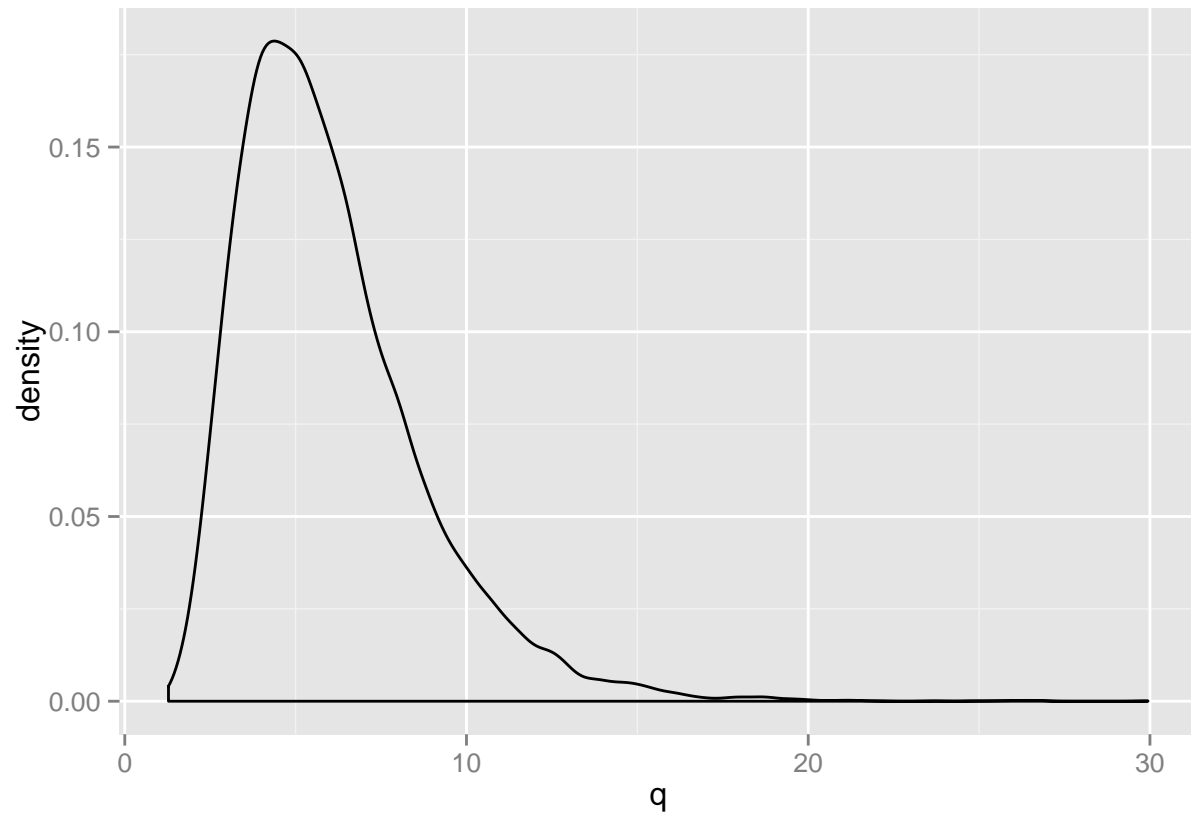
```
qplot(data=pars, theta, geom="density")
```



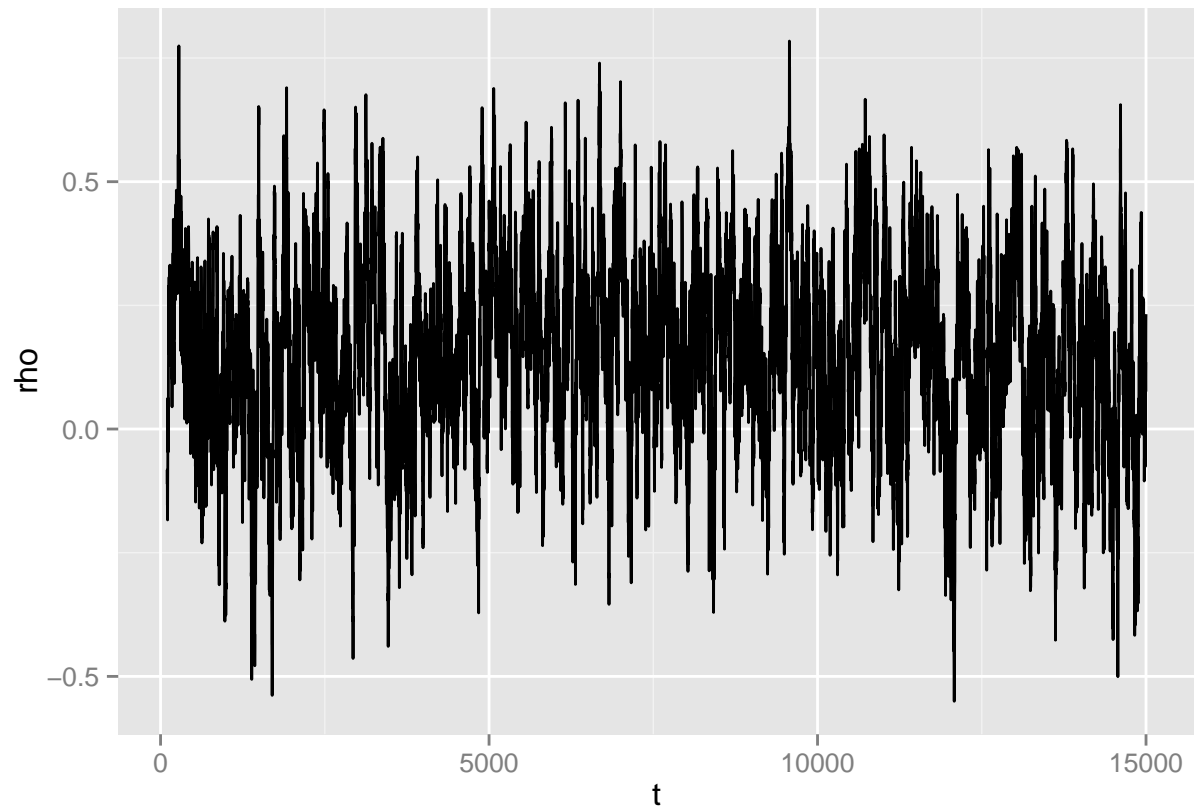
```
qplot(data=pars, s2, geom="density")
```



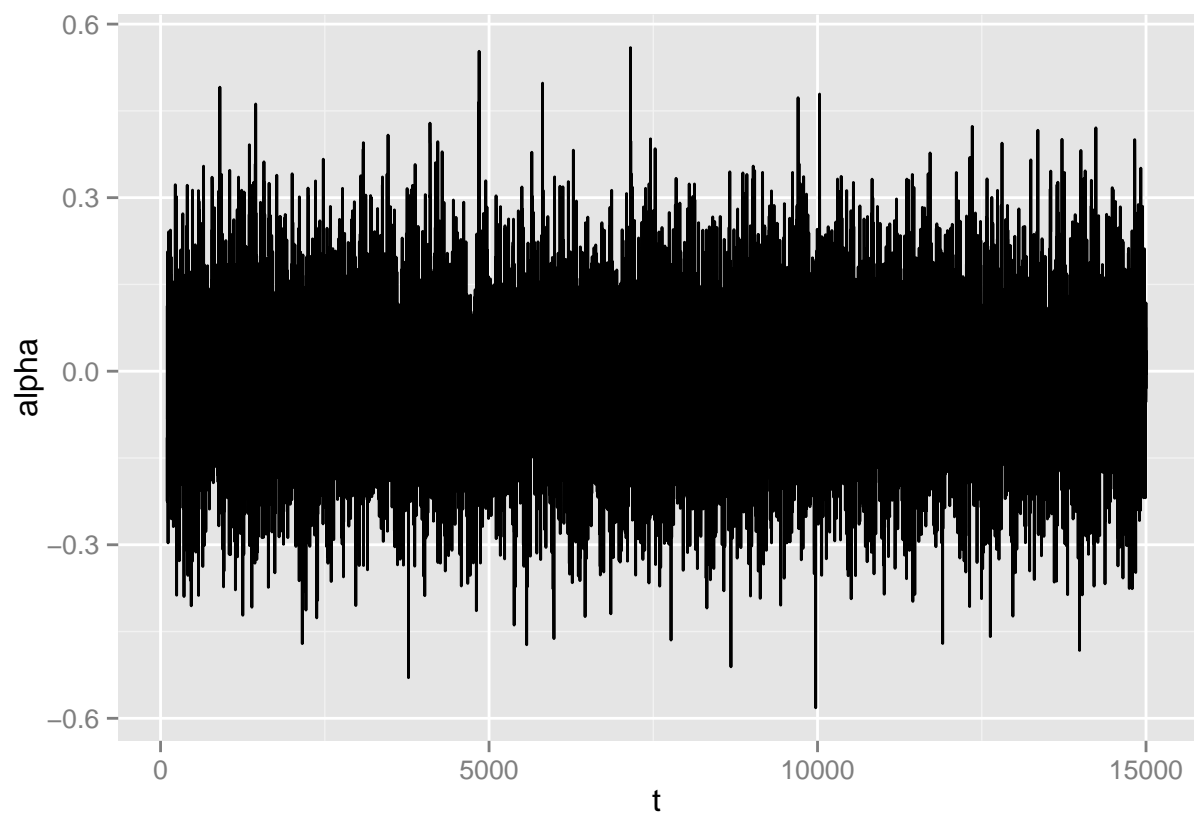
```
qplot(data=pars, q, geom="density")
```



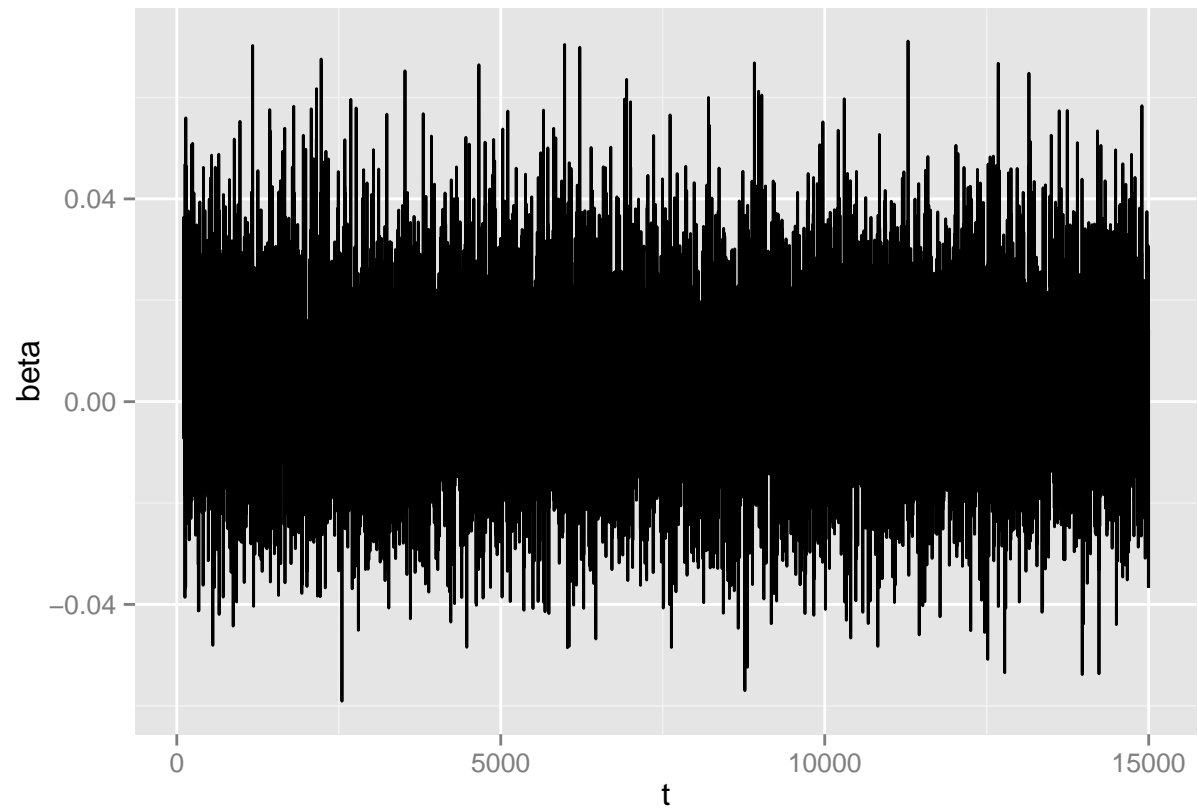
```
qplot(data=pars, t, rho, geom="line")
```



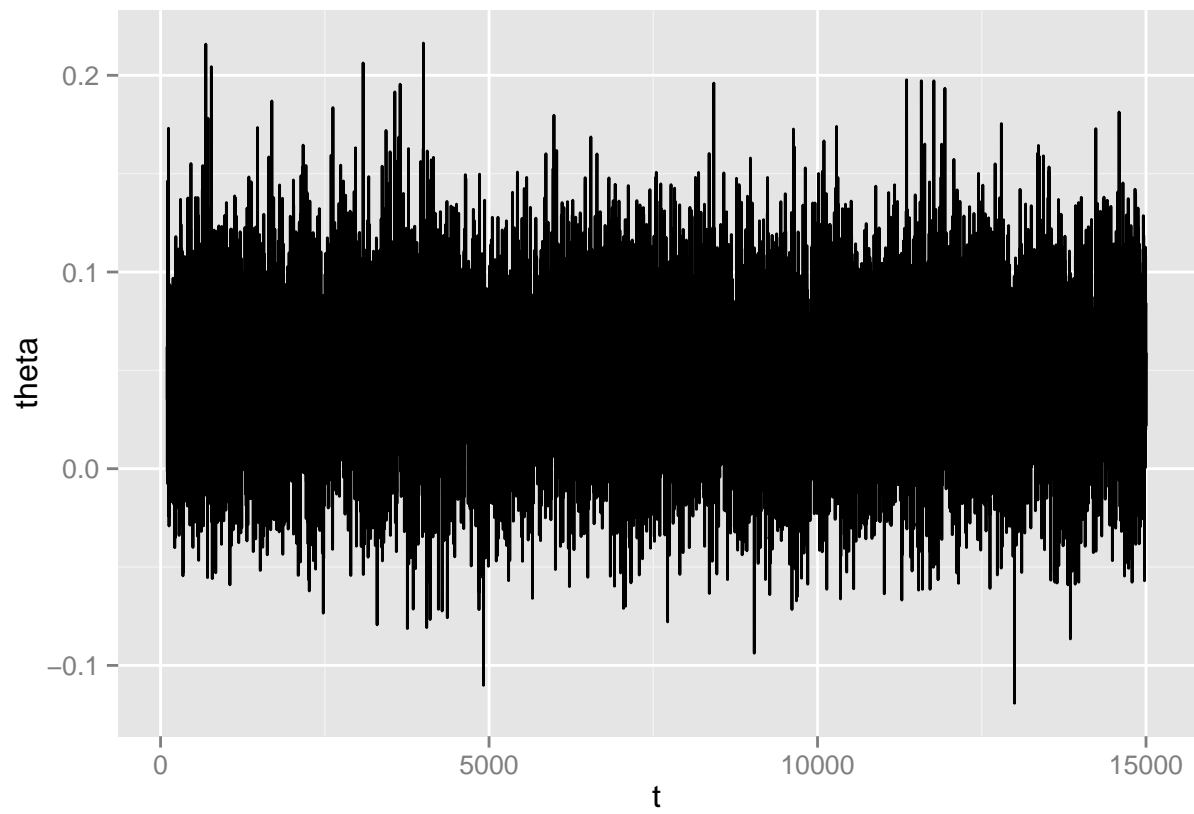
```
qplot(data=pars, t, alpha, geom="line")
```



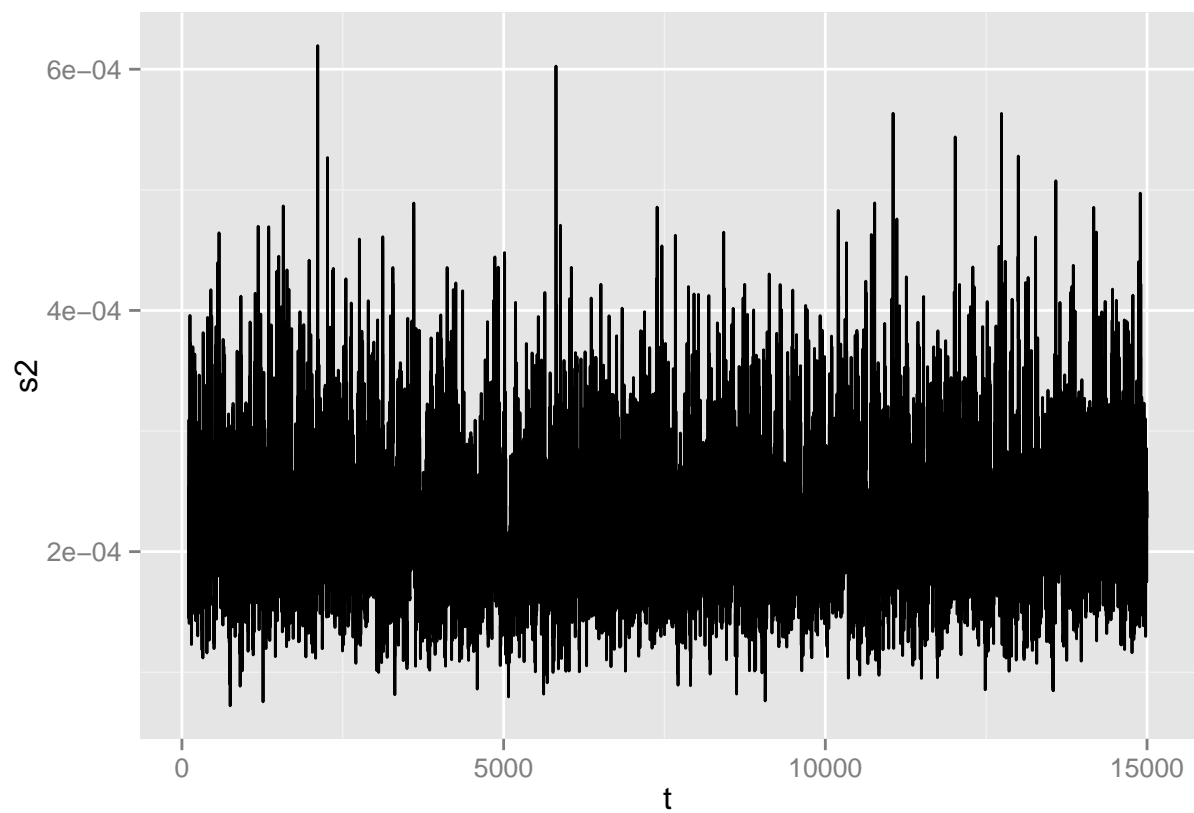
```
qplot(data=pars, t, beta, geom="line")
```



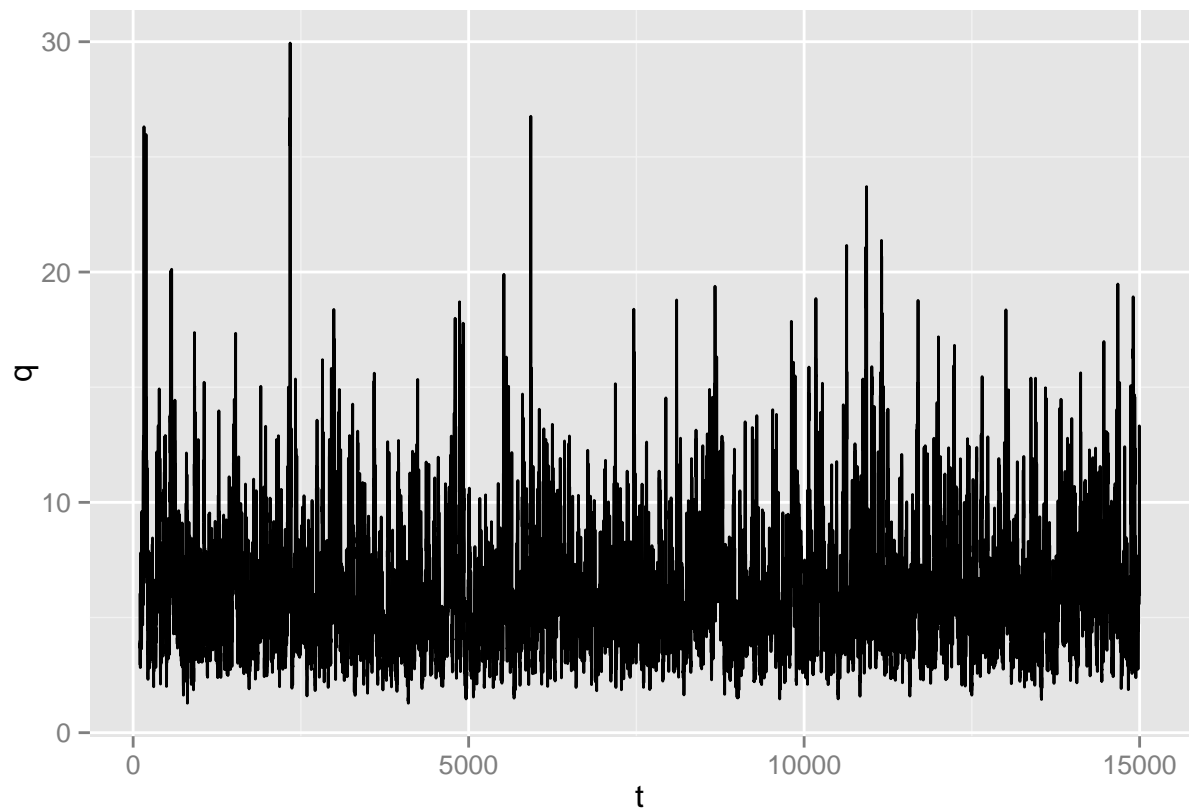
```
qplot(data=pars, t, theta, geom="line")
```

```
qplot(data=pars, t, s2, geom="line")
```



```
qplot(data=pars, t, q, geom="line")
```



Апостериорные средние и медианы:

```
pars_sel <- dplyr::select(pars, rho, alpha, beta, theta, s2, q)
short_summ <- describe(pars_sel)[,2:5]
class(short_summ) <- "data.frame"
pander(short_summ)
```

	n	mean	sd	median
rho	14900	0.1503	0.1894	0.1531
alpha	14900	-0.01833	0.1298	-0.02052
beta	14900	0.003518	0.016	0.003347
theta	14900	0.04755	0.03888	0.04753
s2	14900	0.0002227	6.026e-05	0.000215
q	14900	6.018	2.696	5.502

HPD-интервалы:

```
pander(HPDinterval(mcmc(pars_sel)))
```

	lower	upper
rho	-0.2069	0.5233
alpha	-0.2639	0.2515

	lower	upper
beta	-0.02797	0.03516
theta	-0.0306	0.1227
s2	0.0001172	0.0003437
q	1.854	11.31

Наличие бимодального распределения для бета:

```
files <- c("./estimation/pars_chain.Rds", "./estimation/pars_chain2.Rds", "./estimation/pars_chain3.Rds")
for (f in files) {
  pars <- readRDS(f)
  pars <- as.data.frame(pars)
  # pars <- dplyr::filter(pars, q>0) # was ist das?

  n_sim_done <- nrow(pars)
  pars <- mutate(pars, t = 1:n_sim_done)
  pars <- dplyr::filter(pars, t>100)

  g <- qplot(data=pars, beta, geom="density", main=f)
  print(g)
}
```

