

KDExp: Kernel Density Estimation Prior Distribution for Exposure Uncertainty Propagation

KDExp_Example

[1] Load the simulated data:

```
set.seed(8453)
```

```
library(KDExp)
library(kernelboot)
```

```
## Warning: package 'kernelboot' was built under R version 4.1.1
```

```
load("C:\\Users\\jlw98\\Desktop\\Yale Research\\Created R Packages\\KDExp\\KDExp_Example\\simulated_data.Rsave")
```

```
y<-sim_data[[1]]
x<-matrix(1,
          nrow = length(y),
          ncol = 1)
z_ppd<-sim_data[[2]]
dim(z_ppd)
```

```
## [1] 250 1000
```

[2] Fit the Models:

```
#####
#UKDE Bandwidth Estimation
#####
h<-rep(0.00,
      times = length(y))
for(k in 1:length(y)){
  h[k]<-bw.SJ(z_ppd[k,])
}
```

```
#####
#MKDE Bandwidth Estimation
#####
H<-bw.scott(t(z_ppd))
```

```
#####
#Model Fitting
#####
burnin<-1000
mcmc_samples<-6000
thin<-10
keep_set<-seq((burnin + 1),
              mcmc_samples,
              thin)

results_ukde<-UKDE(mcmc_samples = mcmc_samples,
                  y = y,
                  x = x,
                  z_ppd = z_ppd,
                  h = h,
```

```

likelihood_indicator = 1)

## Progress: 10%
## *****
## Progress: 20%
## *****
## Progress: 30%
## *****
## Progress: 40%
## *****
## Progress: 50%
## *****
## Progress: 60%
## *****
## Progress: 70%
## *****
## Progress: 80%
## *****
## Progress: 90%
## *****
## Progress: 100%
## *****

results_mkde<-MKDE(mcmc_samples = mcmc_samples,
                   y = y,
                   x = x,
                   z_ppd = z_ppd,
                   H = H,
                   likelihood_indicator = 1)

## Progress: 10%
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## Progress: 100%
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[3] Analyzing Output:

plot(results_ukde$theta[keep_set,1], type="l")
lines(results_mkde$theta[keep_set,1], col = "red")

```

