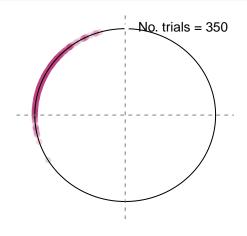
# Circular Drift Difussion Model on JAGS: Full example

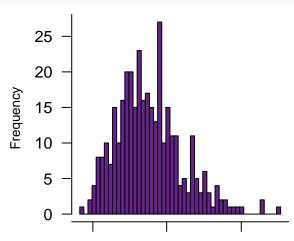
06 September, 2022

## 1. Generate/load simulated data

```
# Establish no. of trials
trials <- 350
# Call Rscript to generate simulated data / load it if already existing
source("./getData.R")
dim(data)</pre>
```

## [1] 350 2
# Plot data
cddm.plotData(data)





# Print parameter values used to generate this data par

## true.theta0 true.drift true.bound true.ter0 ## 2.685 2.870 3.990 0.230

#### 2. Write JAGS model

#### where:

- drift is the magnitude of the drift vector composed by the individual drift rates related to the average motion observed across the x and y axes, according to the CDDM.
- bound is the threshold (i.e. the radius of the circle)
- ter0 is the non-decision time (a.k.a. "time for encoding and response")
- theta0 is the direction of the drift vector, in radians.

#### Prepare Settings to be passed to JAGS

```
n.chains = 4
n.iter = 2500
n.burnin = 500
n.thin = 1
perParticipant = FALSE
perTask = FALSE

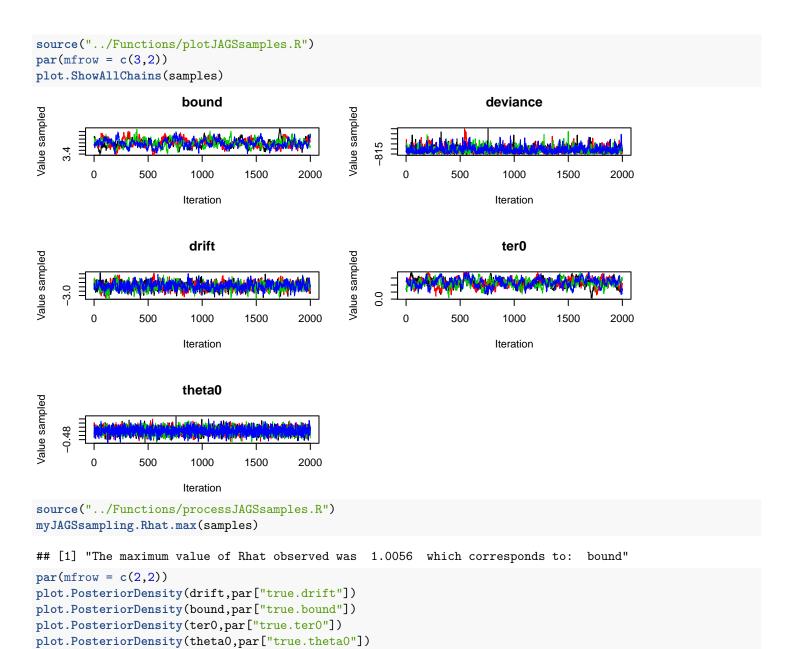
sampling.Settings <- list(n.chains,n.iter,n.burnin,n.thin,perParticipant,perTask)
names(sampling.Settings) <- c("n.chains","n.iter","n.burnin","n.thin","perParticipant","perTask")</pre>
```

#### Run JAGS model

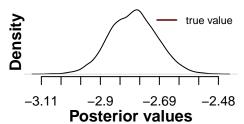
```
map.bound <- JAGSoutput.maxDensity(bound)
map.ter0 <- JAGSoutput.maxDensity(ter0)

MAPS <- c(map.theta0,map.drift,map.bound,map.ter0)
names(MAPS) <- c("map.theta0","map.drift","map.bound","map.ter0")

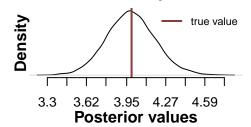
mean.theta0 <- mean(theta0)
mean.drift <- mean(drift)
mean.bound <- mean(bound)
mean.ter0 <- mean(ter0)
means <- c(mean.theta0,mean.drift,mean.bound,mean.ter0)
names(means) <- c("mean.theta0","mean.drift","mean.bound","mean.ter0")</pre>
```



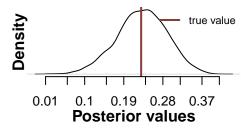
## Posterior density - drift



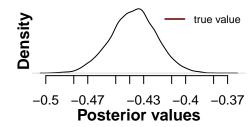
## Posterior density - bound



#### Posterior density - ter0



#### Posterior density - theta0



## Check against EZ-estimates

```
source("../Functions/ezcdm.R")
EZ <- ezcdm.fit(data$Choice,data$RT)</pre>
## First, compare EZ estimates against true parameter values
ΕZ
## EZ.theta0 EZ.drift EZ.bound
                              EZ.ter0
## 2.7043808 2.8427654 4.0235061 0.2442079
par
## true.theta0 true.drift true.bound
                                  true.ter0
       2.685
                  2.870
                            3.990
                                      0.230
# Then, compare against point descriptors for posterior samples
## map.theta0 map.drift map.bound
                                map.ter0
##
      -0.434 -2.770
                         3.976
                                   0.243
means
## mean.theta0 mean.drift mean.bound
                                  mean.ter0
## -0.4372454 -2.7828805 3.9850560
                                  0.2316032
```