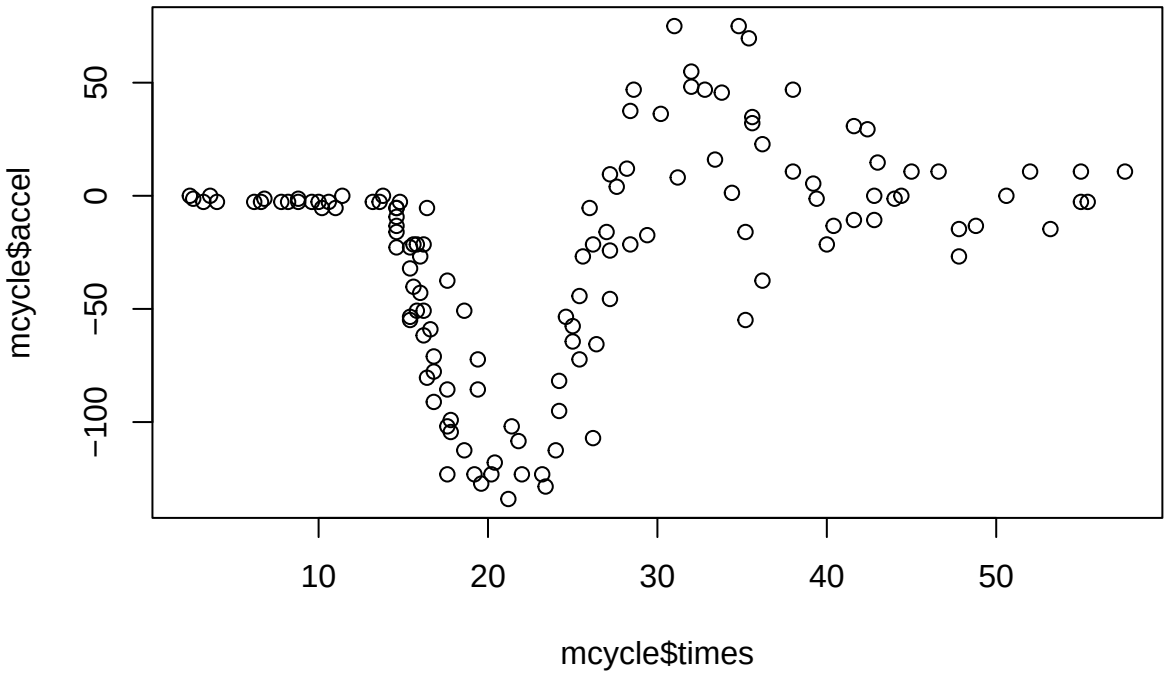
A4Q1

Undergraudate Student

```
library(MASS)
data(mcycle)
plot(mcycle$times,mcycle$accel)
```




```
mcycle<- mcycle[-sample(nrow(mcycle),5),]
library(wavethresh)
```

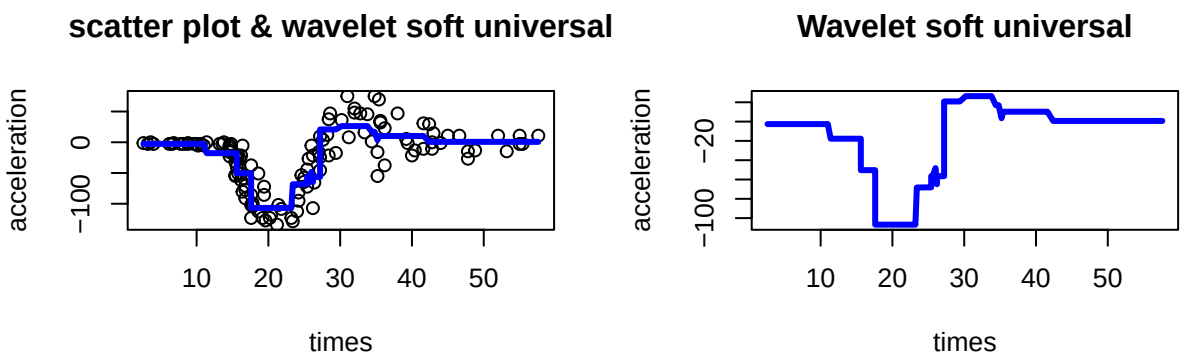
```
## WaveThresh: R wavelet software, release 4.6.8, installed
```

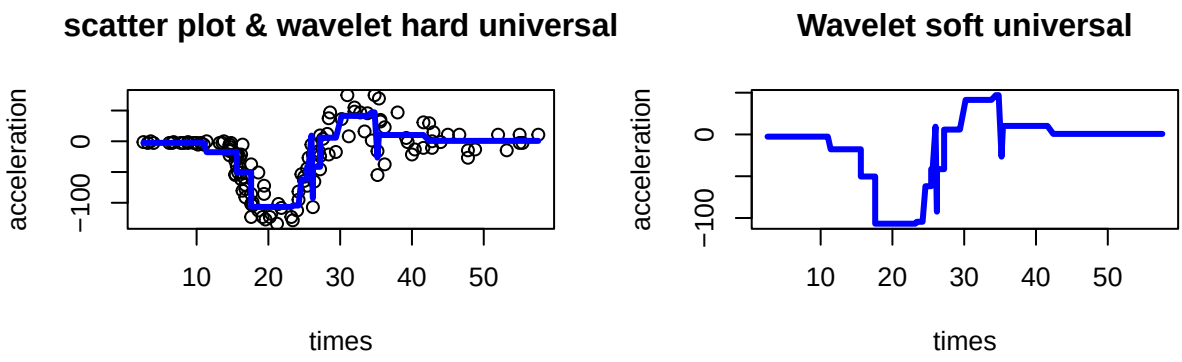
```
## Copyright Guy Nason and others 1993-2016
```

```
## Note: nlevels has been renamed to nlevelsWT
```

```
Ywd<-wd(mcycle$accel,filter.number=1,family="DaubExPhase")
par(mfrow=c(2,2))

# soft universal
soft <- threshold(Ywd, type="soft", policy="universal")
```

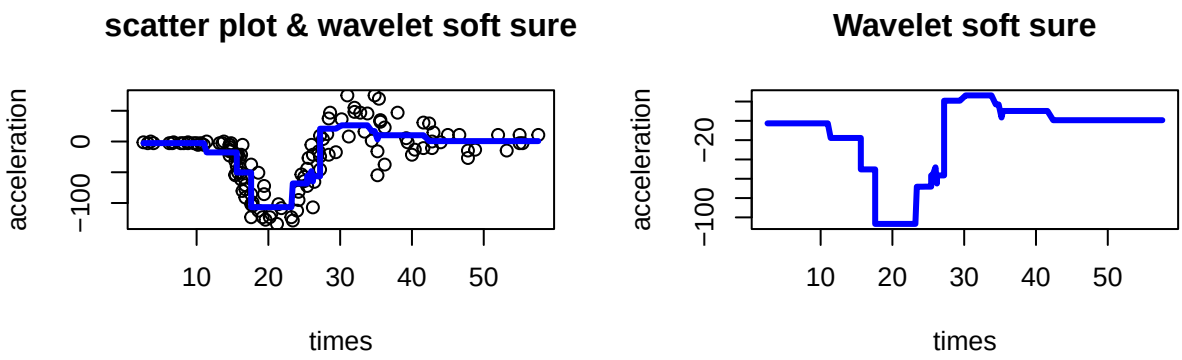
```
softfitted <- wr(soft)
plot(mcycle$times,mcycle$accel, xlab="times", ylab="acceleration",
     main="scatter plot & wavelet soft universal")
lines(mcycle$times,softfitted,lwd=3,col="blue")
plot(mcycle$times, softfitted,xlab="times", ylab="acceleration",
     main="Wavelet soft universal", type="l",lwd=3,col="blue")

# hard universal
hard <-threshold(Ywd,type="hard",policy="universal")
hardfitted <- wr(hard)
plot(mcycle$times,mcycle$accel, xlab="times", ylab="acceleration",
     main="scatter plot & wavelet hard universal")
lines(mcycle$times,hardfitted,lwd=3,col="blue")
plot(mcycle$times, hardfitted,xlab="times", ylab="acceleration",
     main="Wavelet soft universal", type="l",lwd=3,col="blue")
```



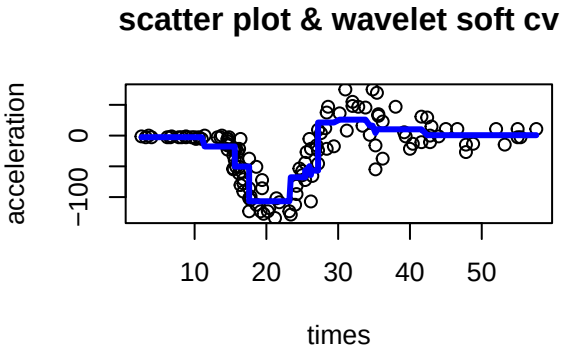


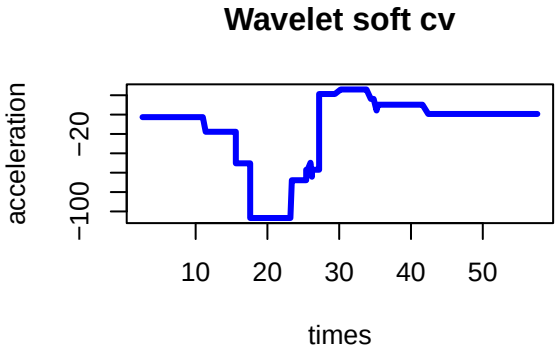

```
par(mfrow=c(2,2))

# soft sure
softSure <- threshold(Ywd, type="soft", policy="sure")
softSureFitted <- wr(softSure)
plot(mcycle$times,mcycle$accel, xlab="times", ylab="acceleration",
     main="scatter plot & wavelet soft sure")
lines(mcycle$times,softSureFitted,lwd=3,col="blue")
plot(mcycle$times, softSureFitted,xlab="times", ylab="acceleration",
     main="Wavelet soft sure", type="l",lwd=3,col="blue")

# hard threholding with sure not supported by the package anymore
```

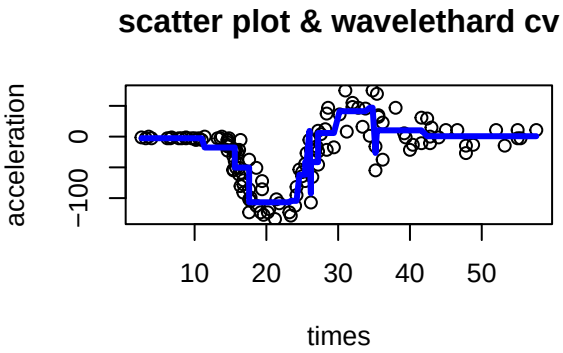
```
#hard sure
# hardSure <- threshold(Ywd, type="hard", policy="sure")
# hardSureFitted <- wr(hardSure)
# plot(mcycle$times,mcycle$accel, xlab="times", ylab="acceleration",
#      main="scatter plot & wavelet hard sure")
# lines(mcycle$times,hardSureFitted,lwd=3,col="blue")
# plot(mcycle$times, hardSureFitted,xlab="times", ylab="acceleration",
#      main="Wavelet hard sure", type="l",lwd=3,col="blue")


#soft cv
par(mfrow=c(2,2))
```

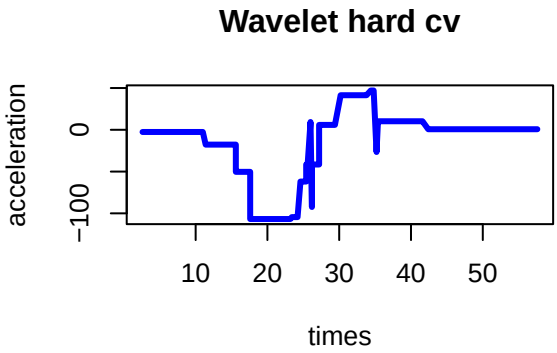



```
softcv <- threshold(Ywd, type="soft", policy="cv")
softcvFitted <- wr(softcv)
plot(mcycle$times,mcycle$accel, xlab="times", ylab="acceleration",
     main="scatter plot & wavelet soft cv")
lines(mcycle$times,softcvFitted,lwd=3,col="blue")
plot(mcycle$times, softcvFitted,xlab="times", ylab="acceleration",
     main="Wavelet soft cv", type="l",lwd=3,col="blue")

#hard cv
hardcv <- threshold(Ywd, type="hard", policy="cv")
hardcvFitted <- wr(hardcv)
plot(mcycle$times,mcycle$accel, xlab="times", ylab="acceleration",
     main="scatter plot & wavelethard cv")
lines(mcycle$times, hardcvFitted,lwd=3,col="blue")
plot(mcycle$times, hardcvFitted,xlab="times", ylab="acceleration",
     main="Wavelet hard cv", type="l",lwd=3,col="blue")
```


scatter plot & wavelet soft cv
acceleration
−100
0
10
20
30
40
50
times


Wavelet soft cv
acceleration
−100
−20
10
20
30
40
50
times


scatter plot & wavelethard cv
acceleration
−100
0
10
20
30
40
50
times


Wavelet hard cv
acceleration
−100
0
10
20
30
40
50
times