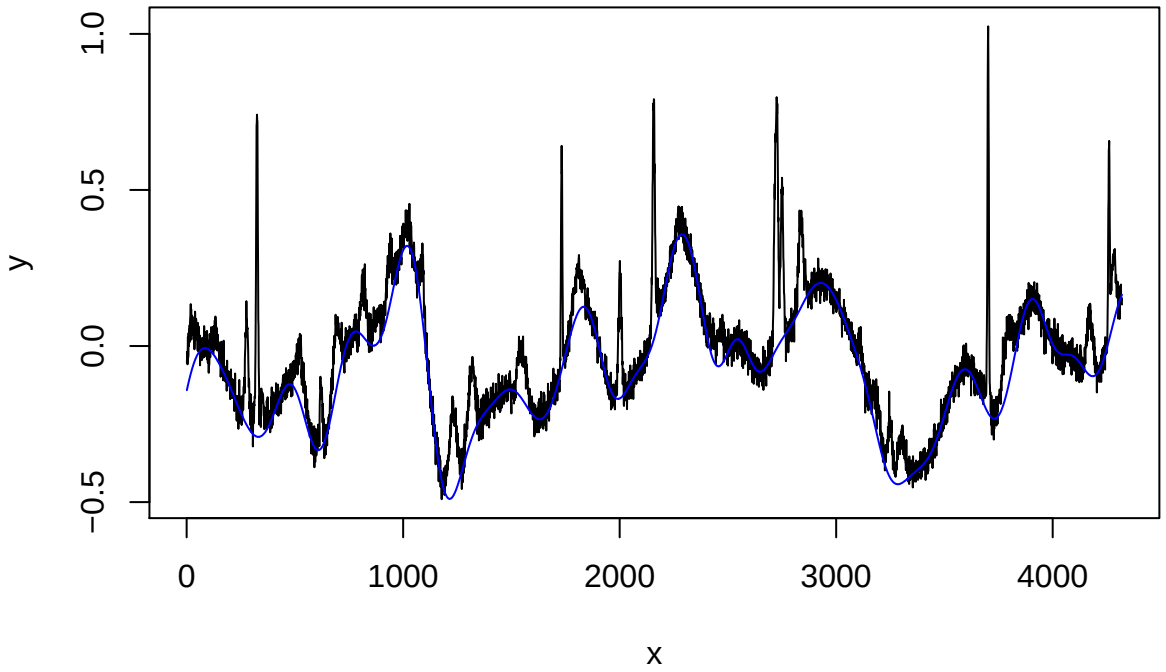
Compare Methods

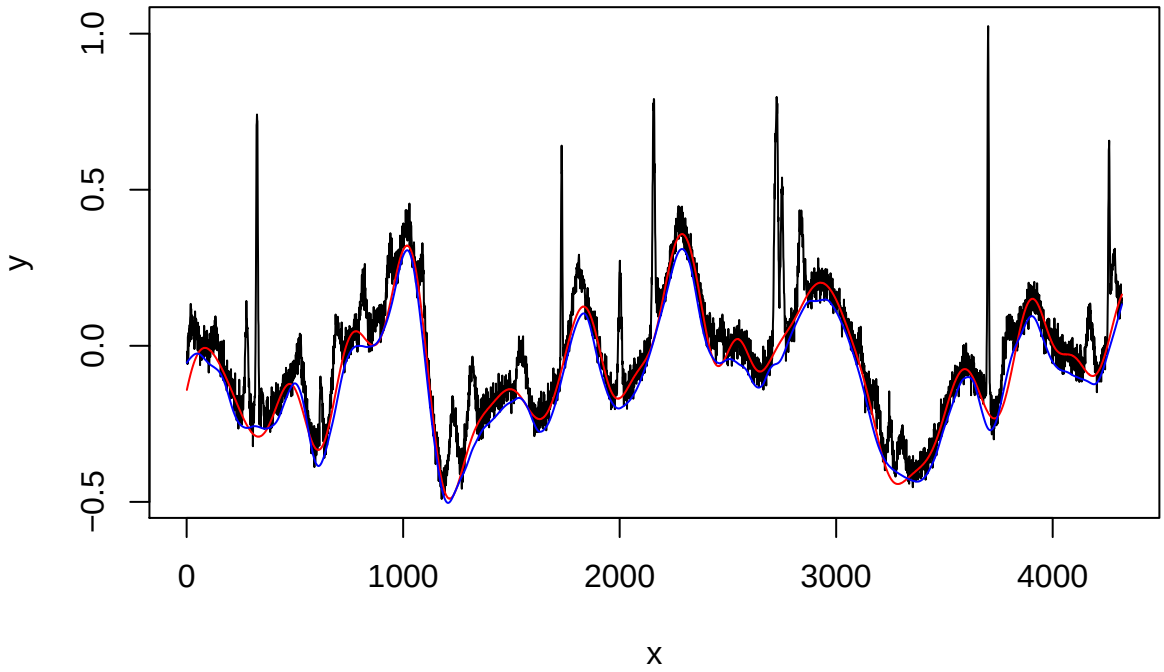
```
################################################################################
set.seed(39207491)
n <- 24*60*60/20
x <- seq(1, n, 1)
distmat <- rdist(x)
COV <- exp(-distmat^2/(n*5)) + 0.000001*diag(n)
L <- chol(COV)

numberOfPeaks <- round(runif(1)*n/30)
peakCenters <- round(runif(numberOfPeaks)*n)
peakHeight <- runif(numberOfPeaks)*10
peakWidths <- round(runif(numberOfPeaks)*20) + 2
wn <- .2*matrix(rnorm(n), ncol=1)


baseline <- t(L)%*%wn
y <- baseline

for (i in 1:numberOfPeaks){
  y <- y + peakHeight[i]*dnorm(x, mean=peakCenters[i], sd = peakWidths[i])
}

noise <- .03*rnorm(n)
y <- y + noise
df <- data.frame(y=y, baseline=baseline, noise=noise)
plot(y~x, type="l")
lines(baseline~x, col="blue")
```



```
k <- 3
lambda0 <- 3*1e-5
lambda <- lambda0*n^k/factorial(k)
tau <- .05
theta <- warmStart(y, k, lambda, tau, 5)
D <- get_Dk(n, k)
eta <- matrix(D%*%theta)
M <- Diagonal(n) + crossprod(D)
cholM <- Matrix::chol(M)


multi_step <- spingarn_multi_step(theta, eta, y, D, cholM,
                                  lambda, .05, 1, 30000, k)

multi_step[[3]]
```

```
## [1] 0.0001393215
```

```
theta_last <- prox_f1(multi_step[[1]], y, tau)

plot(y~x, type="l")
lines(baseline~x, col="red")
lines(theta_last~x, col="blue")
```




```
mean((baseline-theta_last)^2)
```

```
## [1] 0.001552625
```

```
write.csv(df, file="Sim1.csv")
```