

## Supplementary material

### *#Trace Element Peak and Valley R Script*

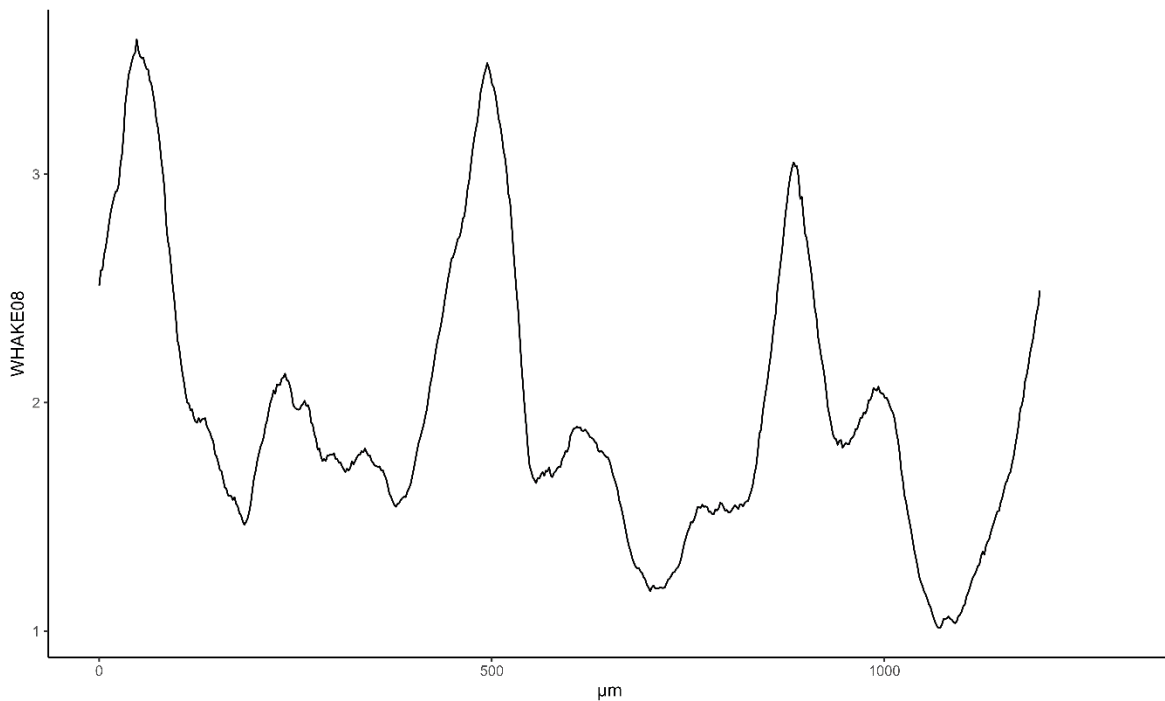
```
library(tidyverse)

## -- Attaching packages ----- tidyverse 1.3.2 --
## v ggplot2 3.3.6      v purrr  0.3.5
## v tibble  3.1.8      v dplyr  1.0.10
## v tidyr   1.2.1      v stringr 1.4.1
## v readr   2.1.3      v forcats 0.5.2

mydata <- read.table("c:\\Users\\benla\\Desktop\\Mn55_Master25.csv",
header=TRUE, sep=",") #Input data set

library(ggplot2)

ggplot(data = mydata, aes(x =  $\mu\text{m}$ , y = WHAKE08)) +
  geom_line(color="black") +#Line plot of elemental concentration
  xlim(0,1300) #Set the x-axis limit
  theme_classic() #Set theme to classic, white background
```



```
library(caret)
library(lattice)
library(ggpmisc)
```

```

library(ggpp)

mydata_ss <- preProcess(as.data.frame(mydata[,c(2:74)]),method=c("range")) #Select data column range you wish to normalize

mydata_A <- predict(mydata_ss, as.data.frame(mydata[, c(2:74)]))
#Normalize data columns

mydata_A$Distance <- mydata$µm #Add Laser distance to new normalized
data set

ggplot(data = mydata_A, aes(x = Distance, y = WHAKE08)) + #select
normalized data set, x and y variables
  geom_line(color="black") + #Draw line plot of element concentrations
  ylim(0:1) + xlim(0,1300) + #Set x and y axes limits
  stat_peaks(colour = "green", size = 1.5, span = 101, ignore_threshold
= 0.15, strict = TRUE, geom = "rug", sides = "b") + #peaks on rug
  stat_peaks(colour = "green", size = 1.5, span = 101, ignore_threshold
= 0.15, strict = TRUE, geom = "point") + #peaks on line plot
  stat_valleys(colour = "red", size = 1.5, span = 151, ignore_threshold =
0.80, strict = TRUE, geom = "rug", sides = "b") + #valleys on rug
  stat_valleys(colour = "red", size = 1.5, span = 151, ignore_threshold
= 0.80, strict = TRUE,geom = "point") + #valleys on line plot
  theme_classic() #set theme to classic

```

