

Line profiles: Unirrd. Data Rg

May 31, 2016

Load required libraries:

Load data exported from Matlab and crop elemental data for the line profiles

```
lineData <- read.csv("C:/Users/andy/Documents/MATLAB/EasonLineProfiles_05028.csv")
```

Process the data using melt and dplyr:

```
zline2 <- melt(lineData, id.var = c("x", "xDist", "ID", "r",  
  "area"), variable.name = "ions")
```

Use dplyr to convert the counts into a percentage composition.

```
# composition for each line profile  
  
zline3 <- zline2 %>% group_by(x, xDist, ID, r, area) %>% mutate(ions = ions,  
  value = 100 * value/sum(value))  
  
# summed composition  
  
zline2d <- zline2 %>% group_by(x, ions) %>% summarise(value = sum(value),  
  count = length(id)) %>% mutate(value = 100 * value/sum(value))
```

Transform to "cut" the data by cluster radius into groups.

```
zline2d_cut <- zline2 %>% mutate(rr = radius.cut(x = r, lower = 0,  
  upper = 2, by = 1)) %>% group_by(x, rr, ions) %>% summarise(value = sum(value),  
  count = length(id)) %>% mutate(value = 100 * value/sum(value))
```

Plot all of the data:

```
ggplot(subset(zline2d, ions != "Fe"), aes(x = x, colour = ions,  
  y = value)) + geom_line() + theme_bw(10) + labs(x = "Distance (Profile Points)",  
  y = "Composition at%")
```

Plot the radius grouped data

```
ggplot(subset(zline2d_cut, ions != "Fe"), aes(x = x, colour = ions,  
  y = value)) + geom_line() + facet_wrap(~rr) + theme_bw(10) +  
  labs(x = "Distance (Profile Points)", y = "Composition at%")
```

```
ggplot(subset(zline2d, ions == "H" | ions == "D" | ions == "Nb"),  
  aes(x = x, colour = ions, y = value)) + geom_line() + theme_bw(10) +  
  labs(x = "Distance (Profile Points)", y = "Composition at%")
```

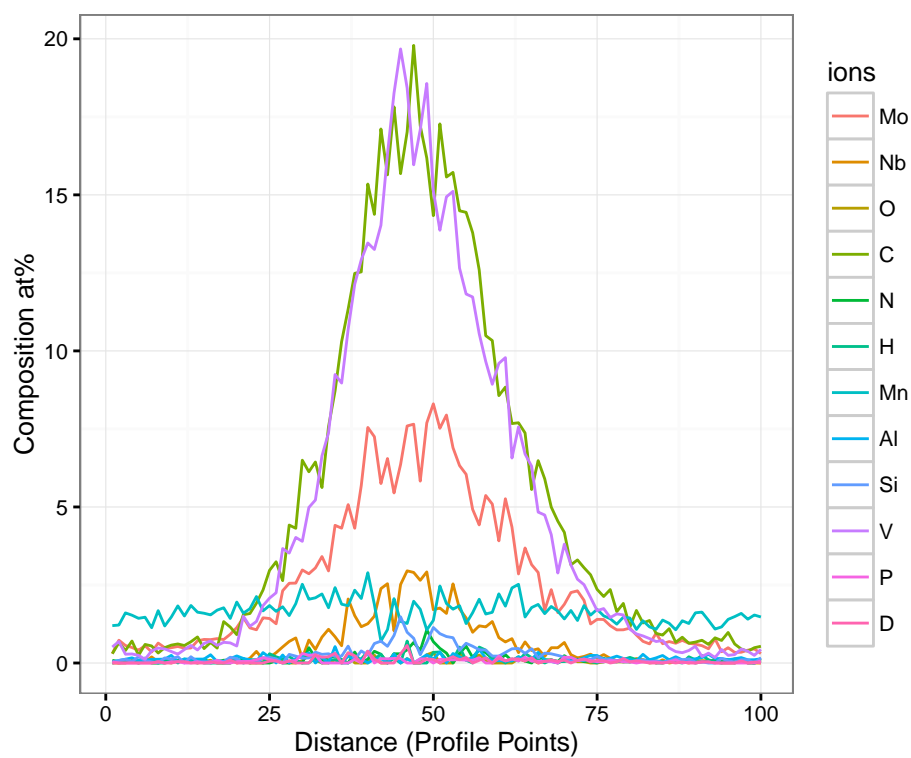


Figure 1: All ions and all clusters

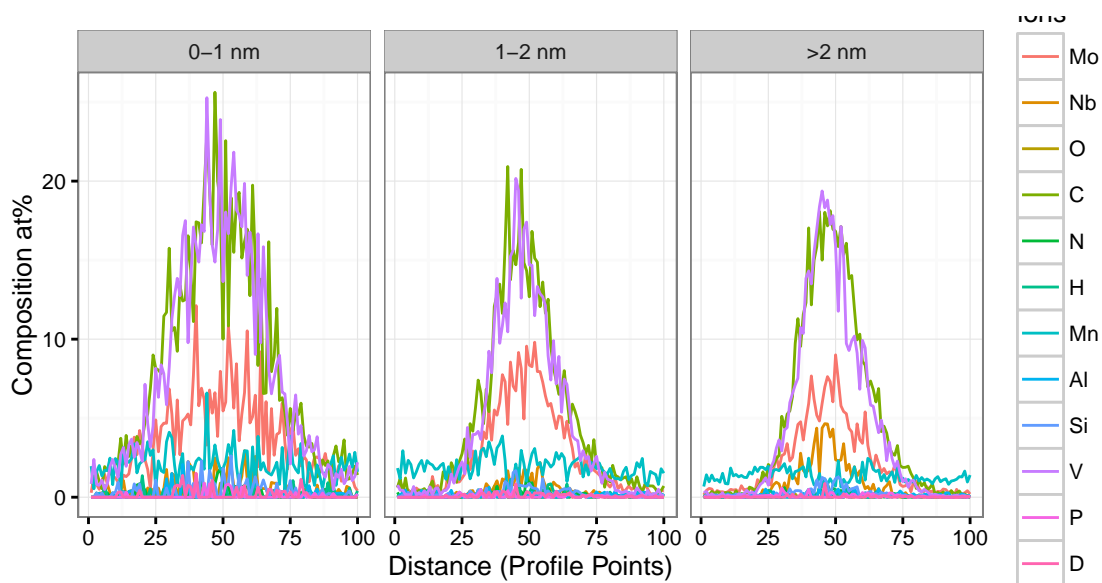


Figure 2: All ions, clusters separated by radius

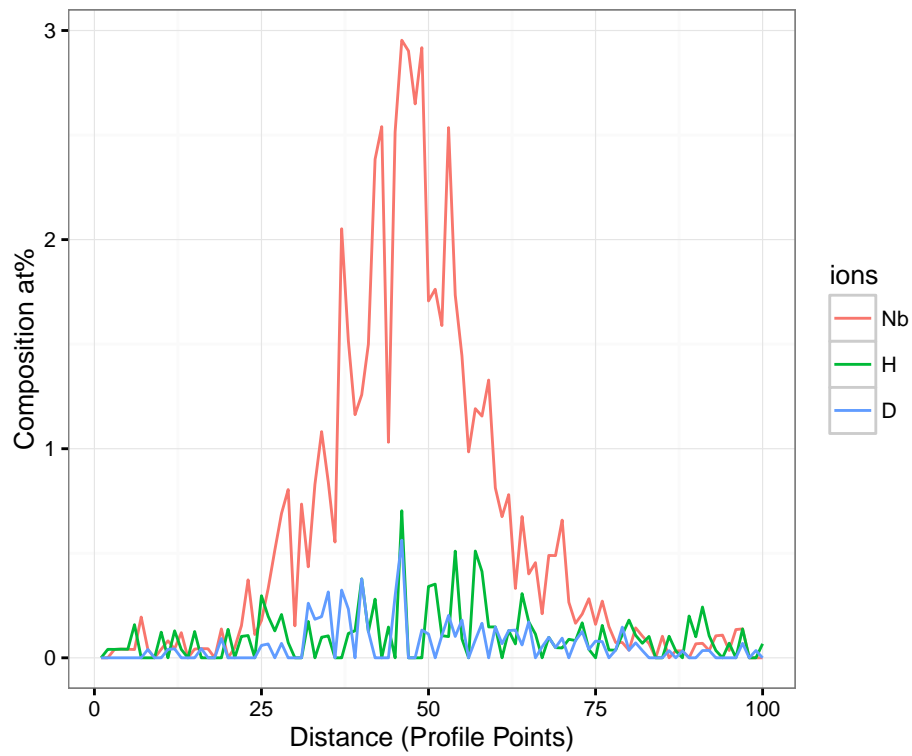


Figure 3: All clusters

Plot the radius grouped data

```
ggplot(subset(zline2d_cut, ions == "H" | ions == "D" | ions ==
  "Nb"), aes(x = x, colour = ions, y = value)) + geom_line() +
  facet_grid(ions ~ rr, scales = "free") + theme_bw(10) + labs(x = "Distance (
    Profile Points)",
    y = "Composition at%")
```

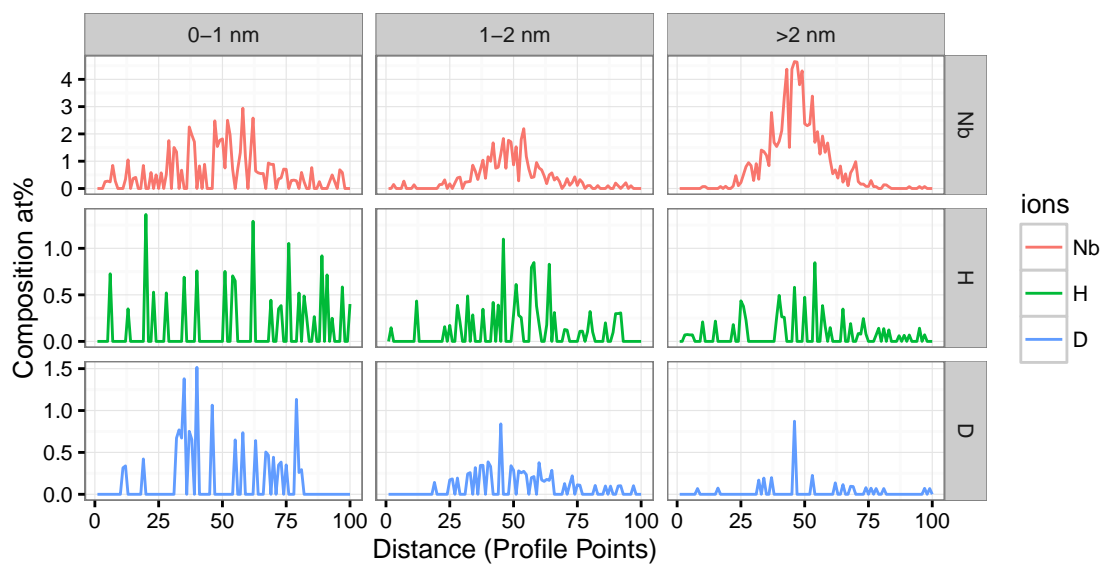


Figure 4: Clusters separated by radius