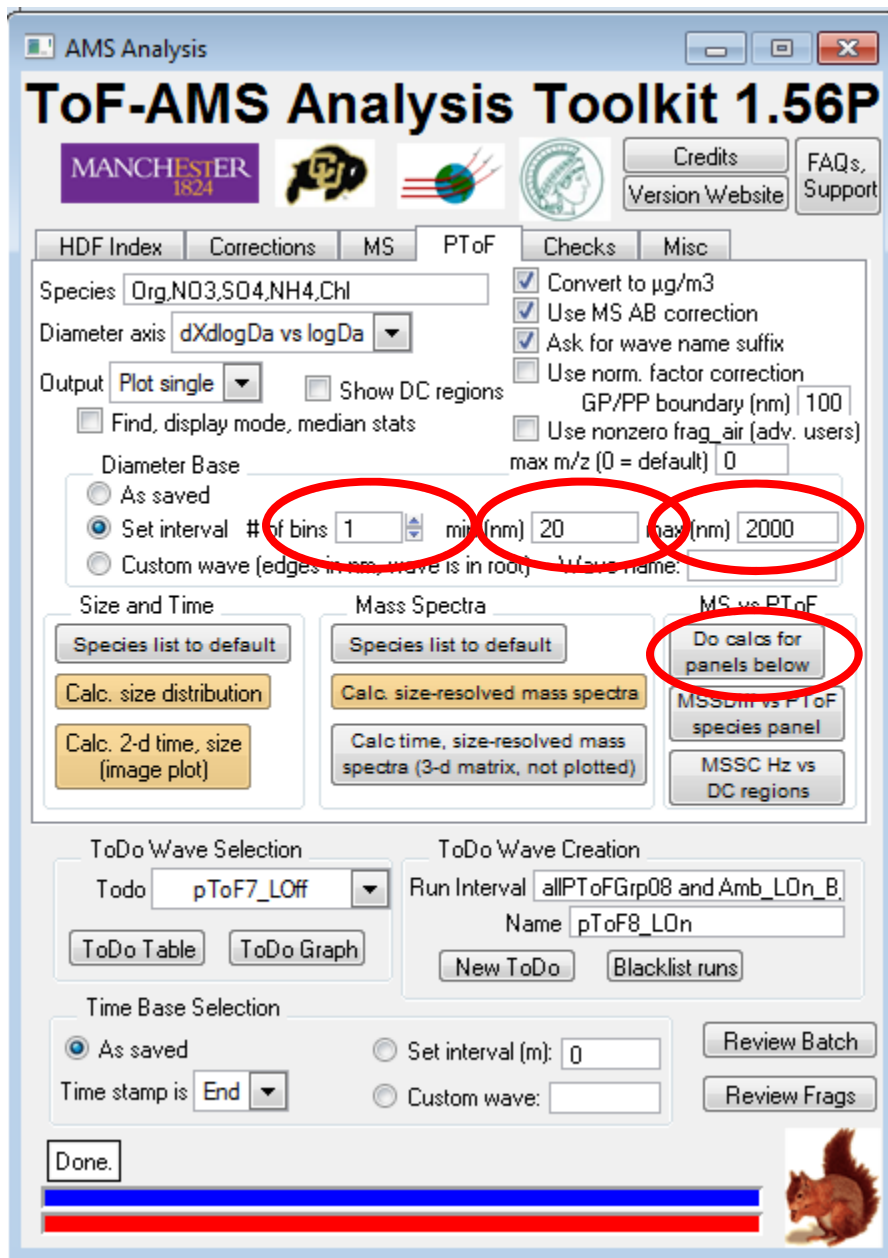


# Looking at pToF/MS

Leah Williams – Aerodyne  
Boulder, 18-June-2015

Can ratio of pToF to MS at 44 compared to 43 tell us anything about f44 issues?

- MS at 44 affected by slow vaporization/surface chemistry
- MS at 43, pToF at 43, pToF at 44 not affected.
- Expect pToF/MS for 44 to be lower than at 43.
- Buttons/panel in pToF tab.
- Look at some field data from Detling, UK, Jan – Feb 2012



## PToF Tab:

- Check Set interval with
  - 1 bin
  - lower size in between gas-phase and particle-phase signals
  - upper size after particle-phase signals
- Click “Do calcs for panels below”

pToF vs MS by species: MS and t\_series

AMS Analysis

# ToF-AMS Analysis Toolkit 1.56P

MANCHESTER 1824

Credits Version Website FAQs, Support

HDF Index Corrections MS PToF Checks Misc

Species:

Diameter axis:

Output:   Show DC regions  Find, display mode, median stats

Convert to  $\mu\text{g}/\text{m}^3$   
 Use MS AB correction  
 Ask for wave name suffix  
 Use norm. factor correction  
 Use nonzero frag. air (adv. users)

GP/PP boundary (nm):   
 max m/z (0 = default):

Diameter Base:  
 As saved  
 Set interval # of bins:  min (nm):  max (nm):   
 Custom wave (edges in nm, wave is in root) Wave name:

Size and Time:

Mass Spectra:


MS vs PToF:

ToDo Wave Selection:

ToDo Wave Creation: Run Interval:  Name:

Time Base Selection:  As saved  Set interval (m):   Custom wave:

Time stamp is:



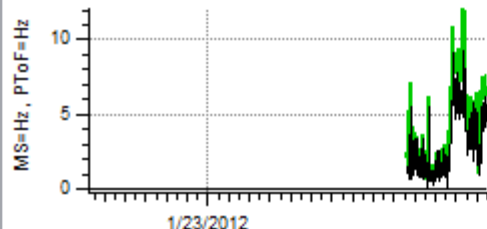
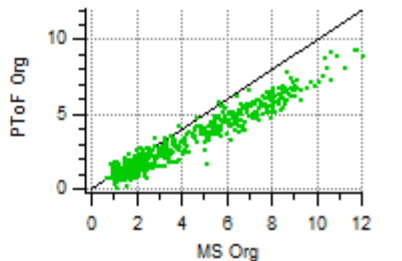
MSvsPToF\_Panel

## MS mode Diff vs PToF v1.0

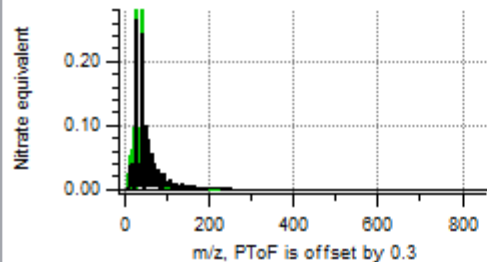
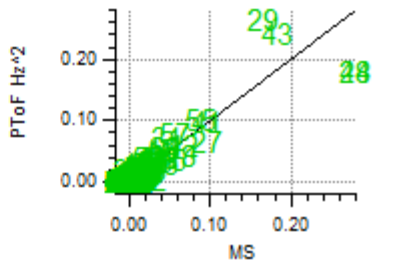
Black=PToF mode; Colored = MS mode  
 todo:pToF7\_LOff  
 use AB correction: Yes  
 diam. min: 20nm diam. max: 2000nm

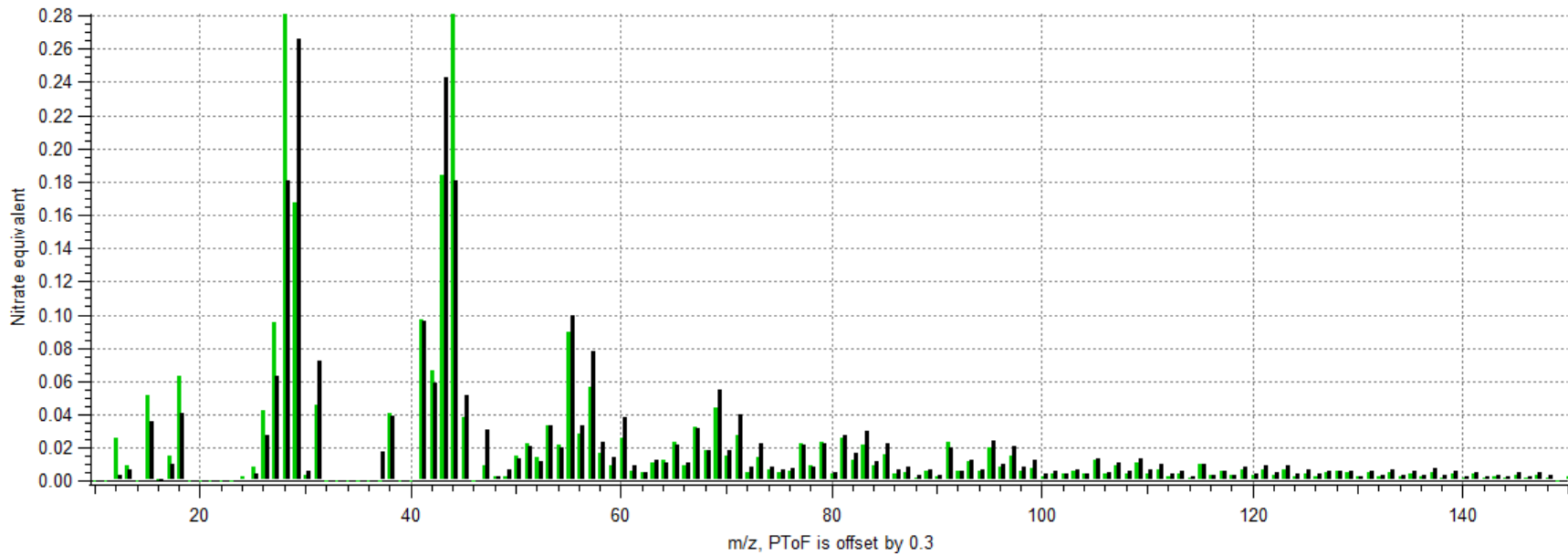
Org:

Time Series  Time Series Scatter

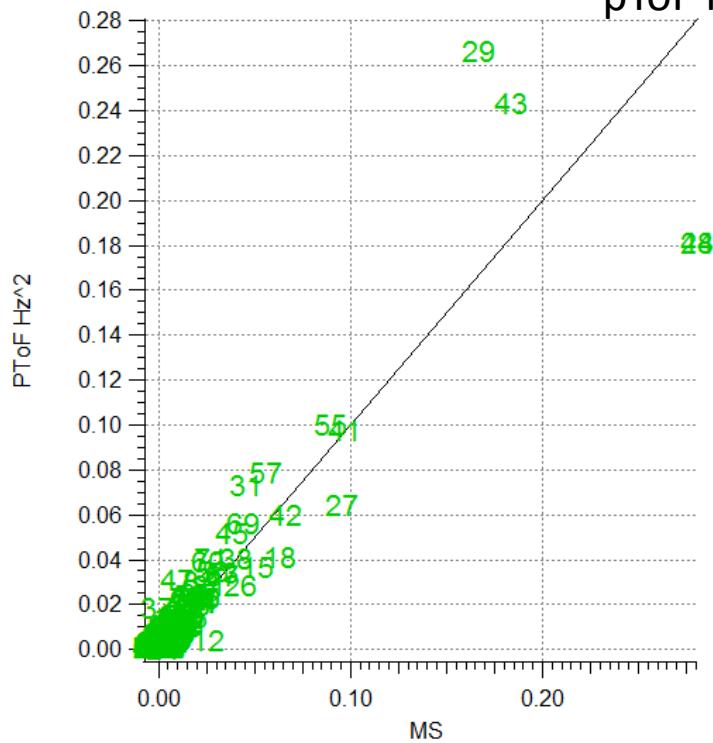



Mass Spec  Mass Spec Scatter

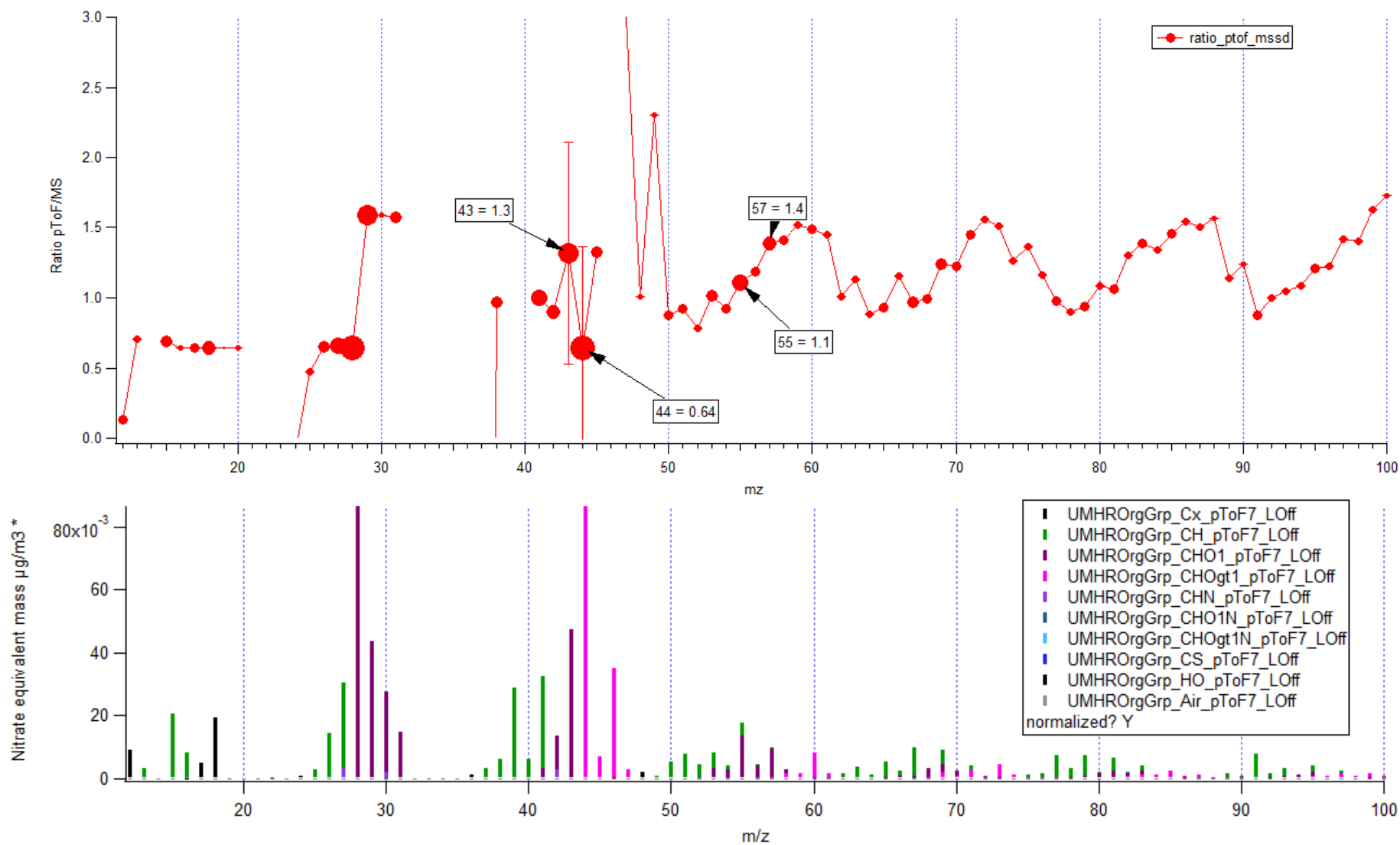


pToF MS (black) vs MSSD (green)



- If pToF > MSSD, then chopper duty cycle may not be correct (older choppers had a variety of slitwidths).
- Set variable root:diagnostics:chopper\_duty

Ratio of pToF/MS from preceding panel.



Oscillation in ratio. Not clearly fn of signal intensity or oxidation.

# AMS Analysis

## ToF-AMS Analysis Toolkit 1.56P

MANCHESTER 1824

Credits Version Website FAQs, Support

HDF Index Corrections MS **PToF** Checks Misc

Species:

Diameter axis:

Output:   Show DC regions

Find, display mode, median stats

Convert to  $\mu\text{g}/\text{m}^3$

Use MS AB correction

Ask for wave name suffix

Use norm. factor correction

GP/PP boundary (nm):

Use nonzero frag\_air (adv. users):

Diameter Base: max m/z (0 = default)

As saved

Set interval # of bins:  min (nm):  max (nm):

Custom wave (edges in nm, wave is in root) Wave name:

Size and Time

Species list to default

Calc. size distribution

Calc. 2-d time, size (image plot)

Mass Spectra

Species list to default

Calc. size-resolved mass spectra

Calc time, size-resolved mass spectra (3-d matrix, not plotted)

MS vs PToF

Do calcs for panels below

MSSDiff vs PToF species panel

**MSSC Hz vs DC regions**

ToDo Wave Selection

ToDo:

ToDo Table ToDo Graph

ToDo Wave Creation

Run Interval:

Name:

New ToDo Blacklist runs

Time Base Selection

As saved


Time stamp is:

Set interval (m):

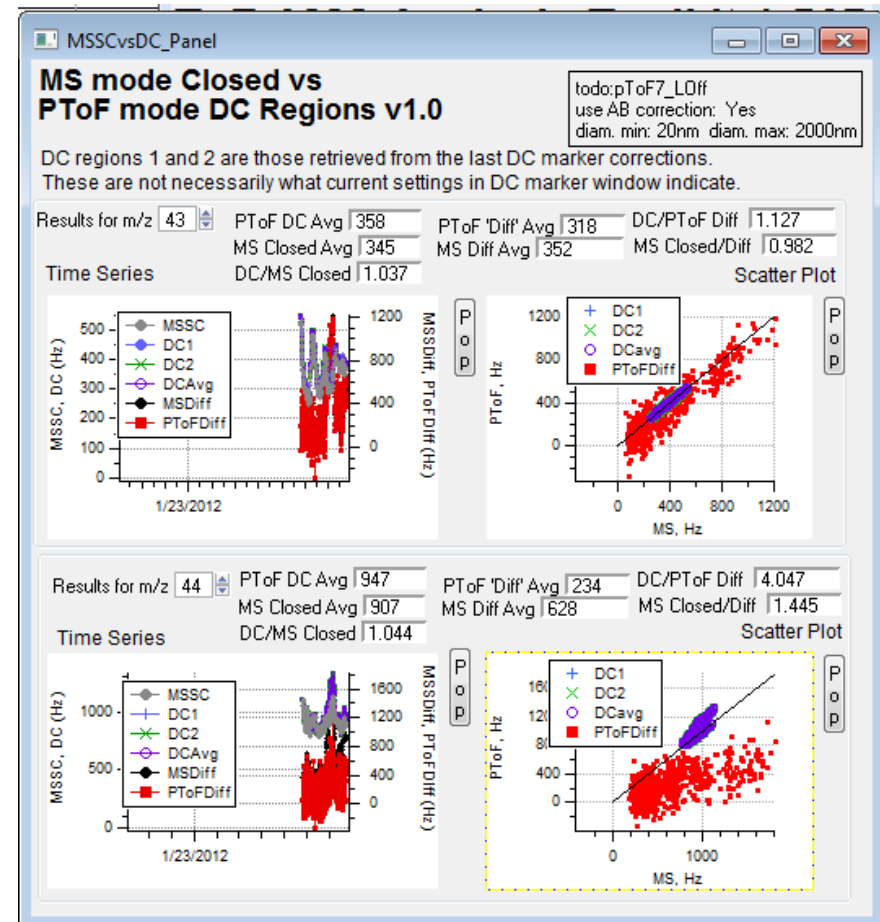
Custom wave:

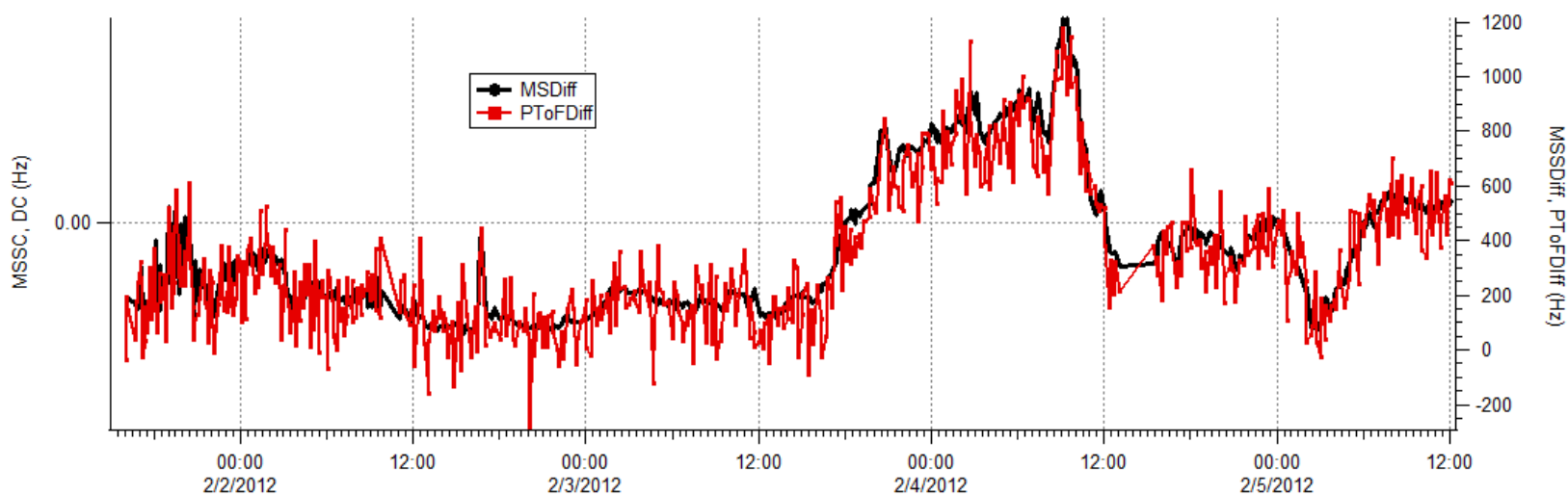
Review Batch Review Frags

Done.

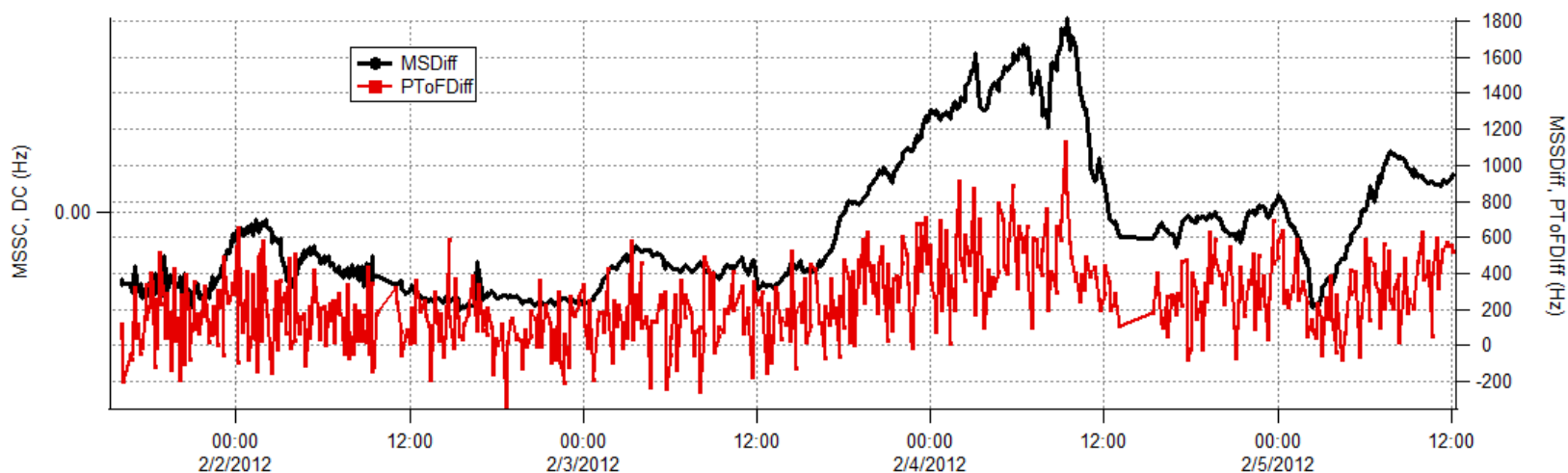


## pToF vs MS by m/z

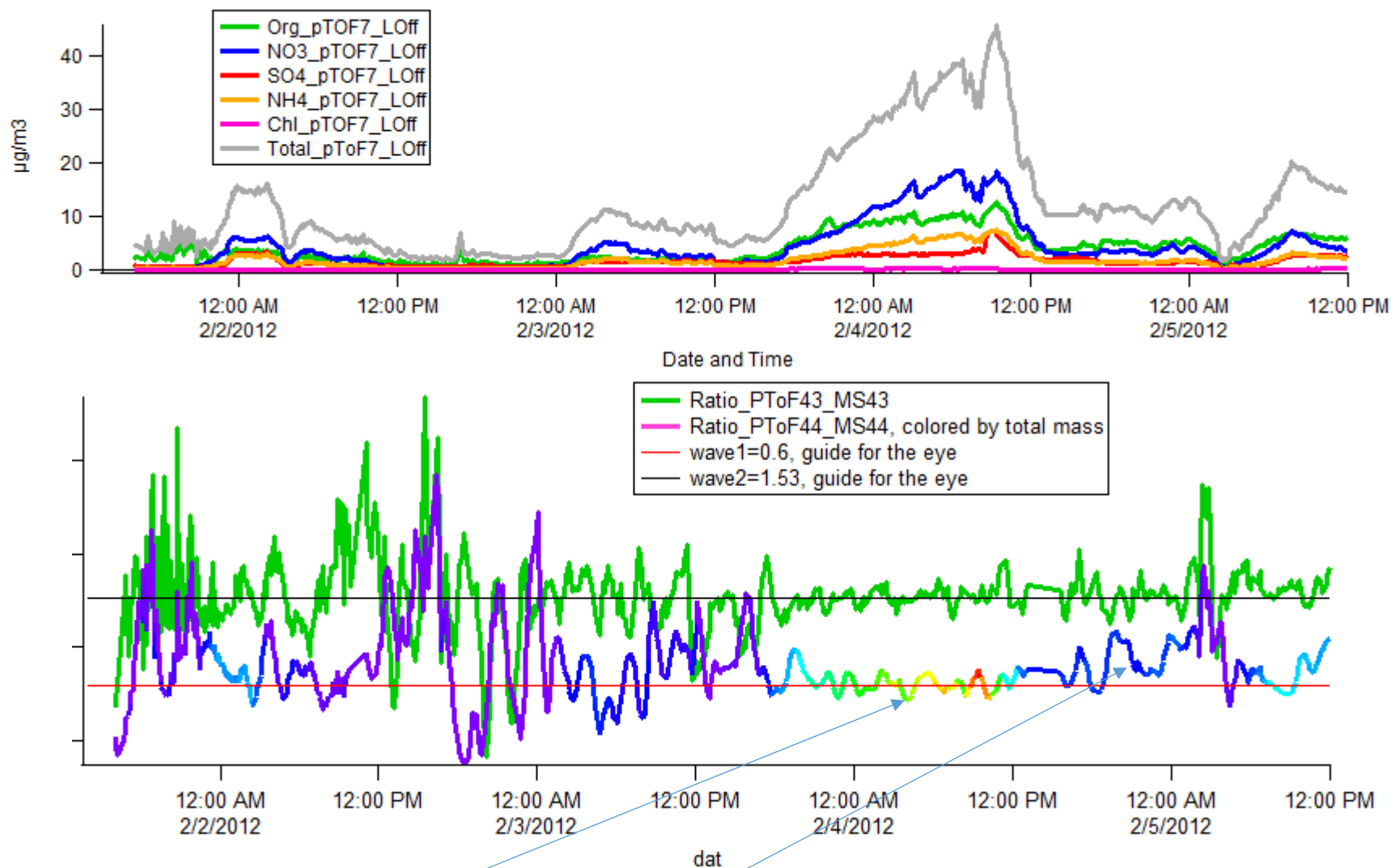




mz 43: pToF and MS same size, track in time, pToF is much noisier.



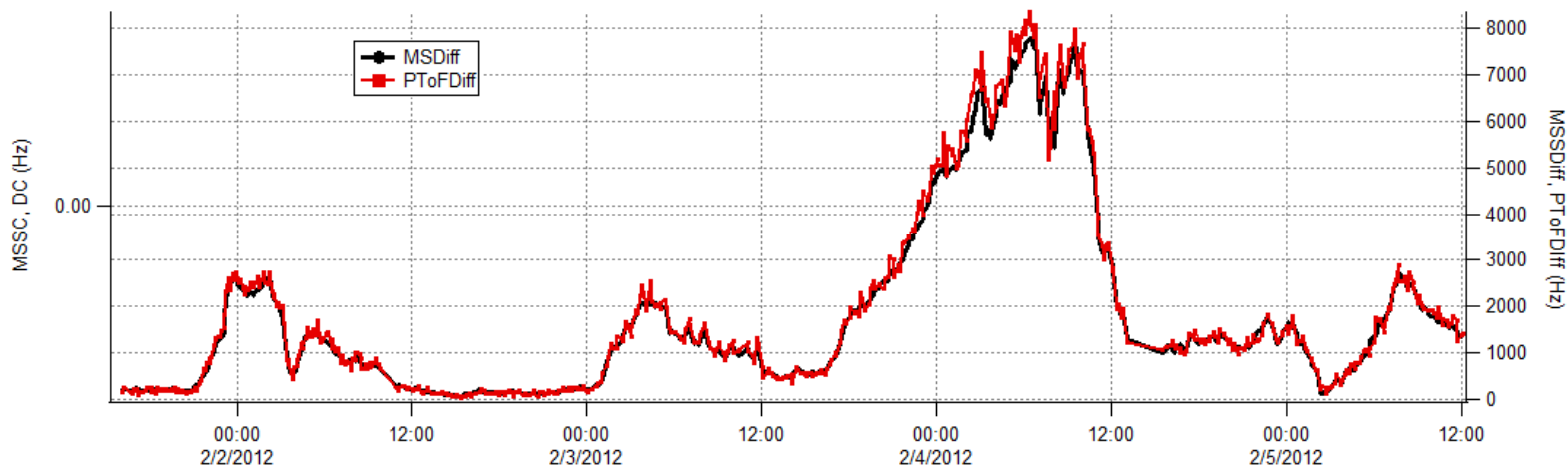
mz 44: pToF < MS same size, don't track in time, pToF is much noisier.



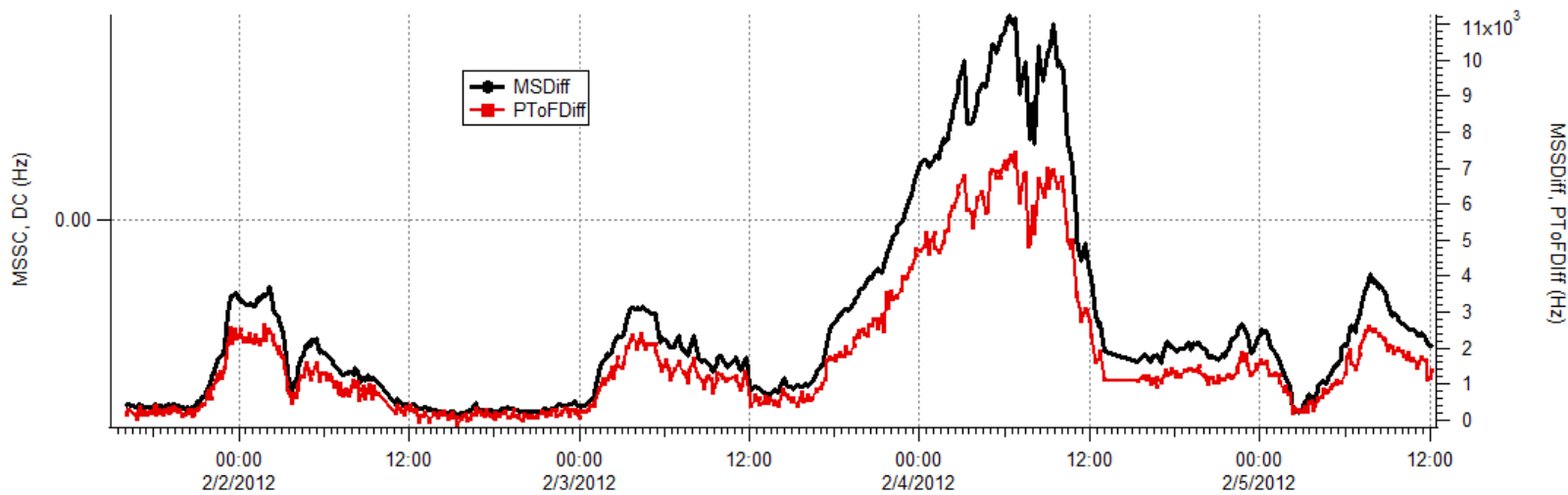
Ratio of smoothed PToF to MS at 43 (green) and 44 (colored by total mass loading in top panel). Very noisy for low mass loadings. Maybe a hint that ptof44/ms44 is lower during high mass loading than medium mass loading, while ptof43/ms43 is constant.



## NO3 Fragments: NO2 mz46 “fast”, NO mz30 “slow”



mz 46: pToF and MS same size, track in time.



mz 30: pToF < MS, track in time.

