

MILAGRO Single Particle MS Update

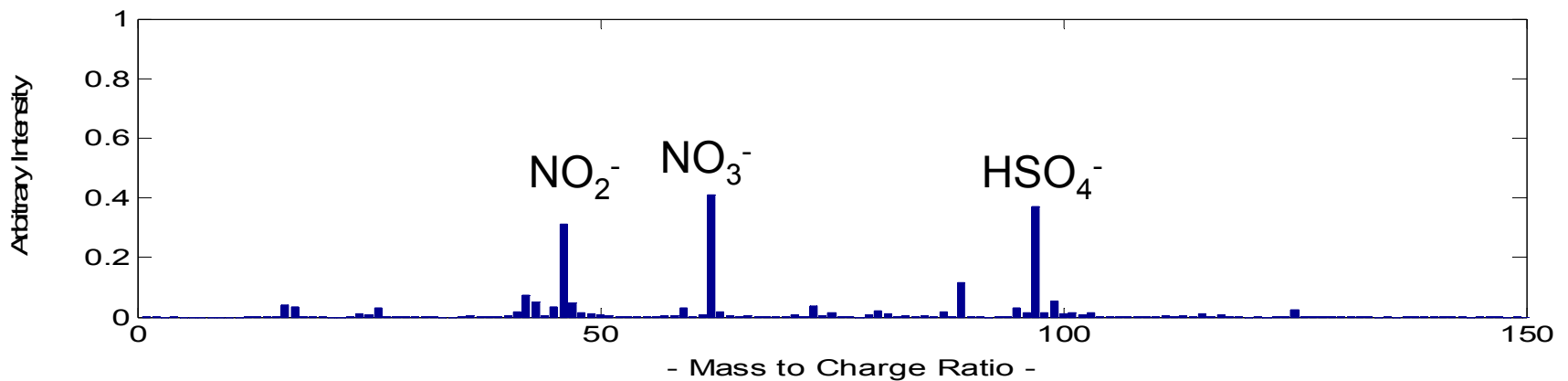
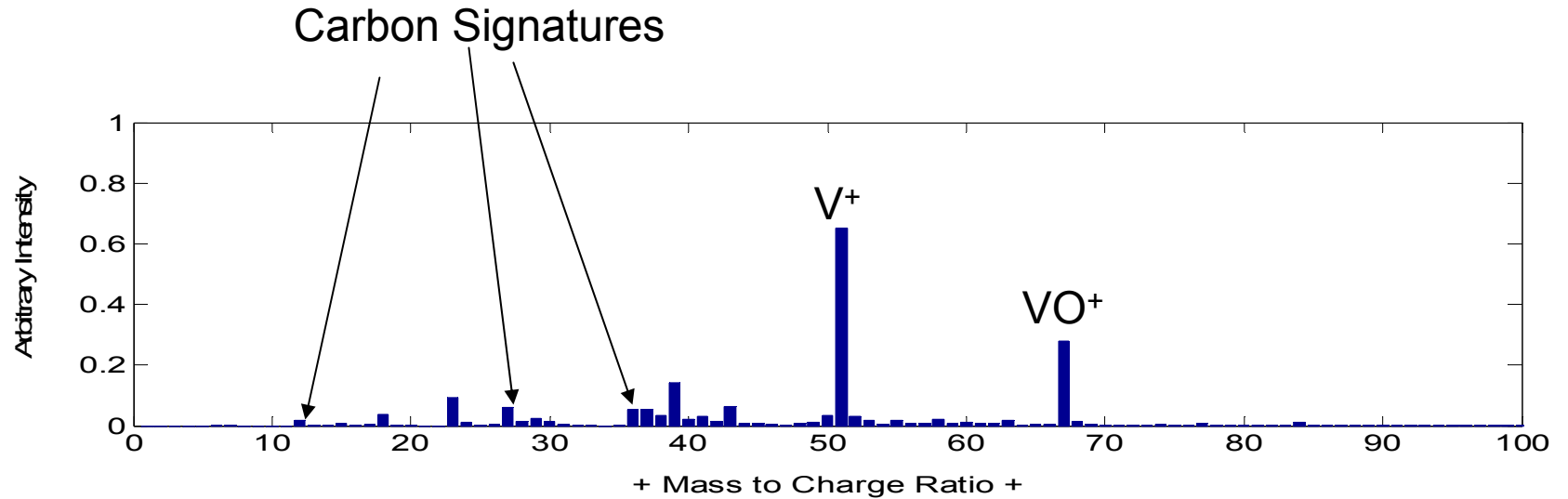
Ryan Moffet and Kimberly Prather
UCSD

Overview of Analysis

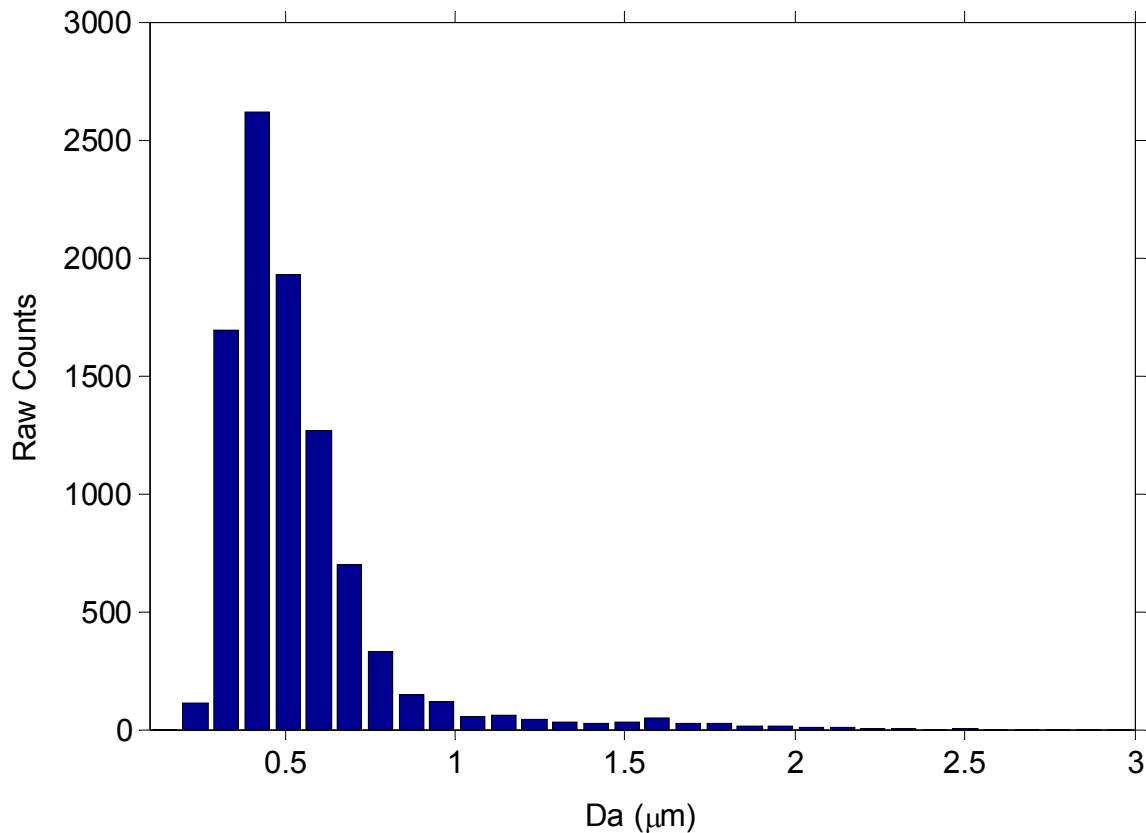
- A cluster analysis was performed for March 6-17th
- The cluster analysis groups single particles by comparing their mass spectra
- Organic, EC, and Biomass particles are the most dominant. They are always a significant portion of the aerosol sample.
- Top cluster: OC...Peaking in the early evening

Vanadium

Positive and Negative Mass Spectra for Vanadium Type

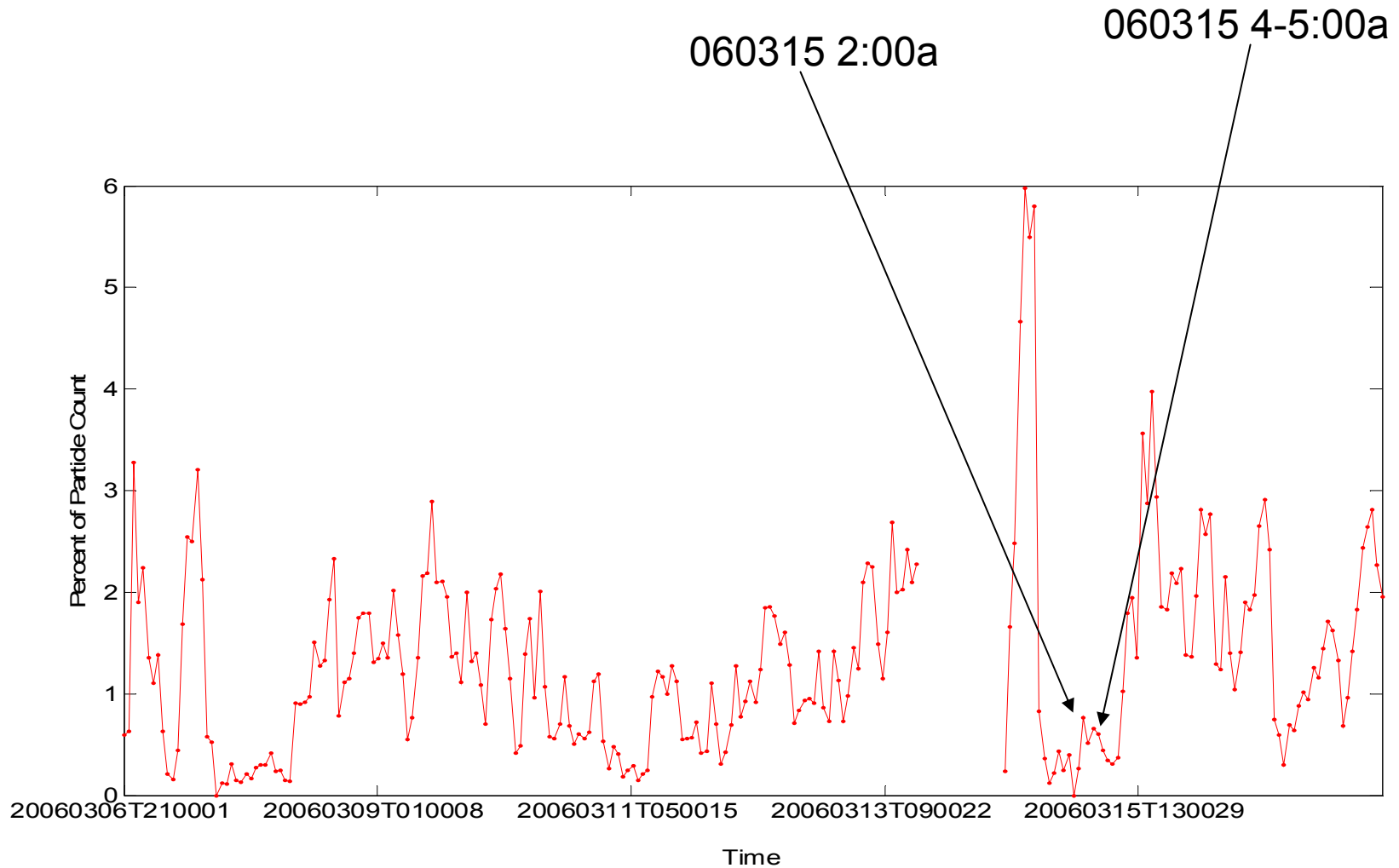


Size Distribution of Vanadium



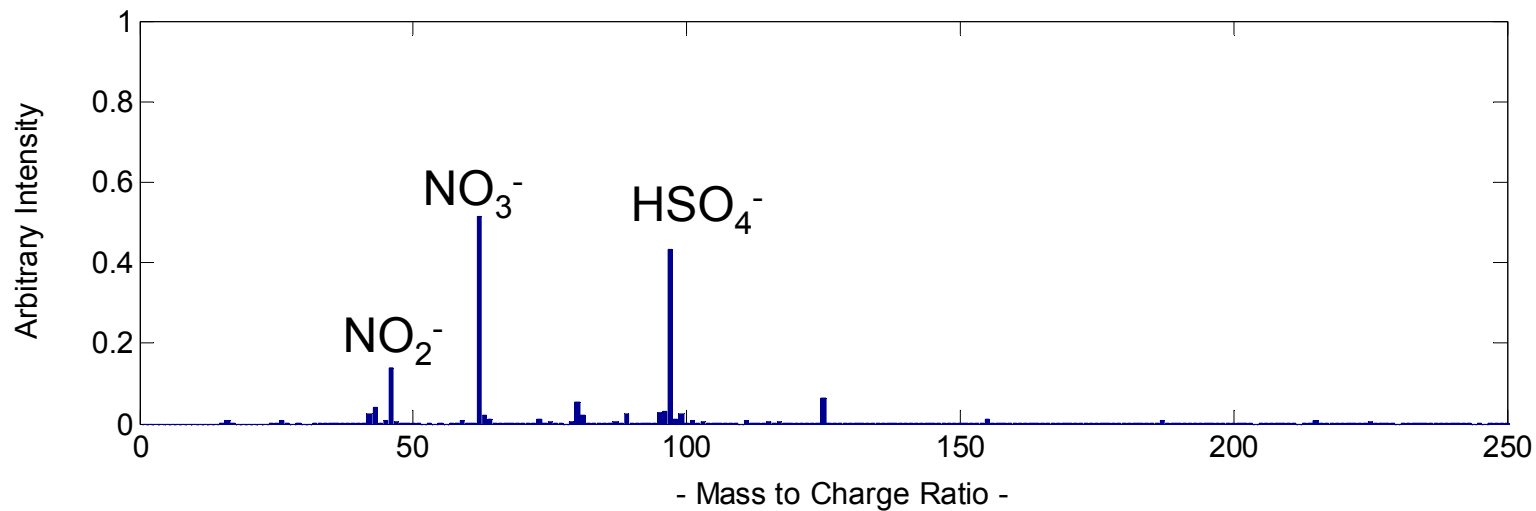
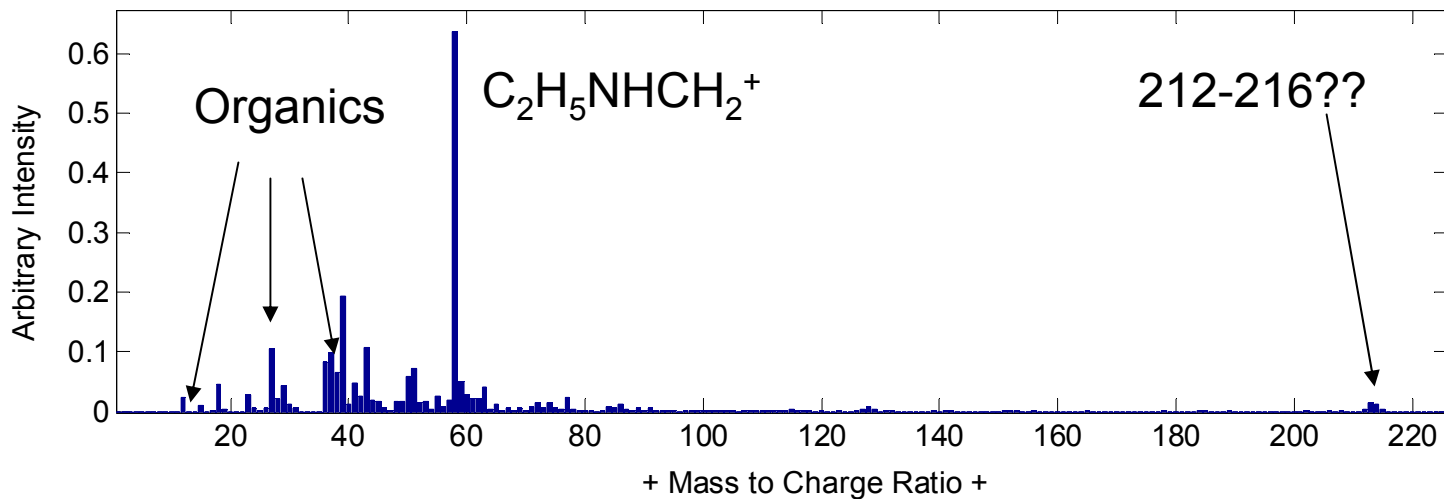
Primarily submicron.
This together with the
carbon signatures
suggests the particles
are formed by
combustion.

Temporal of Vanadium



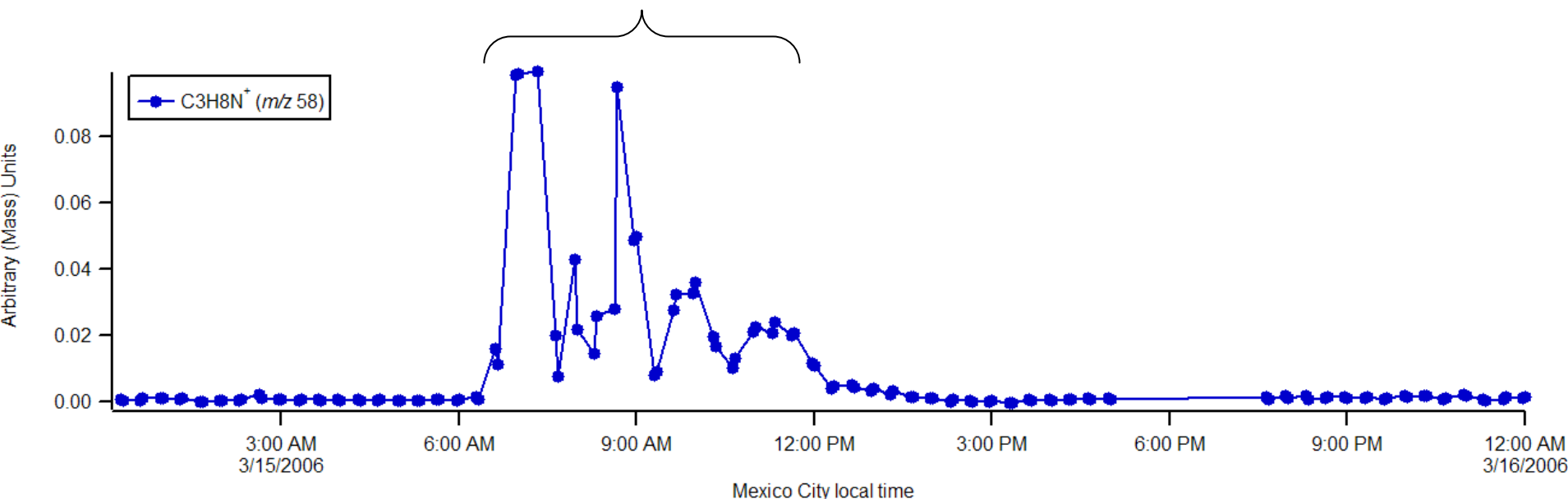
Amine

Amine Spectra



High Res. AMS Validates Peak Assignment of M/Z 58 as C3H8N⁺

Exact Temporal Match With
ATOFMS Amine

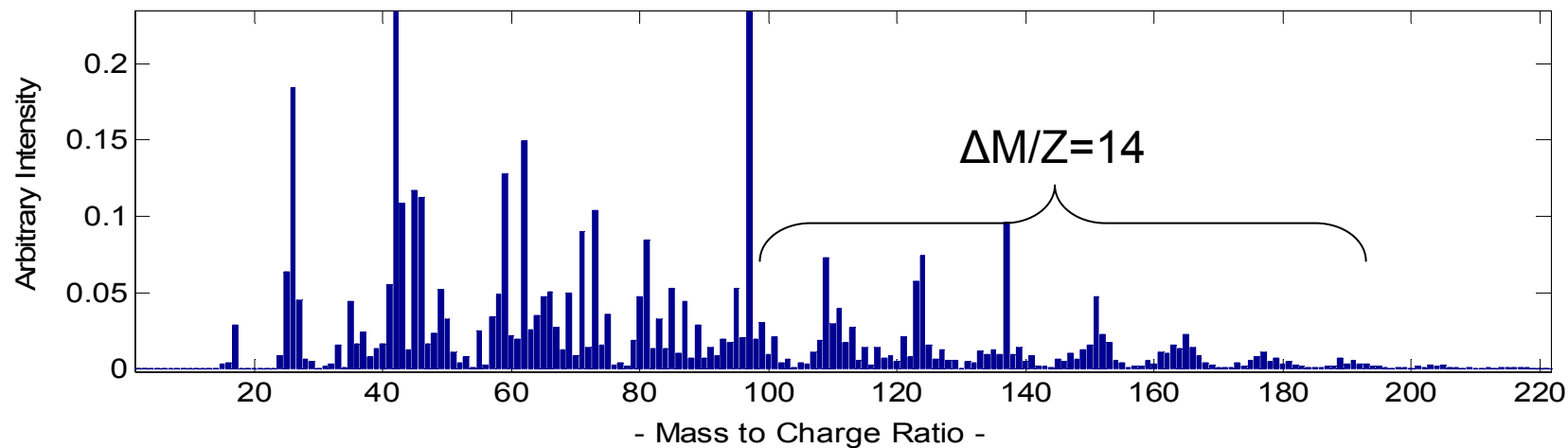
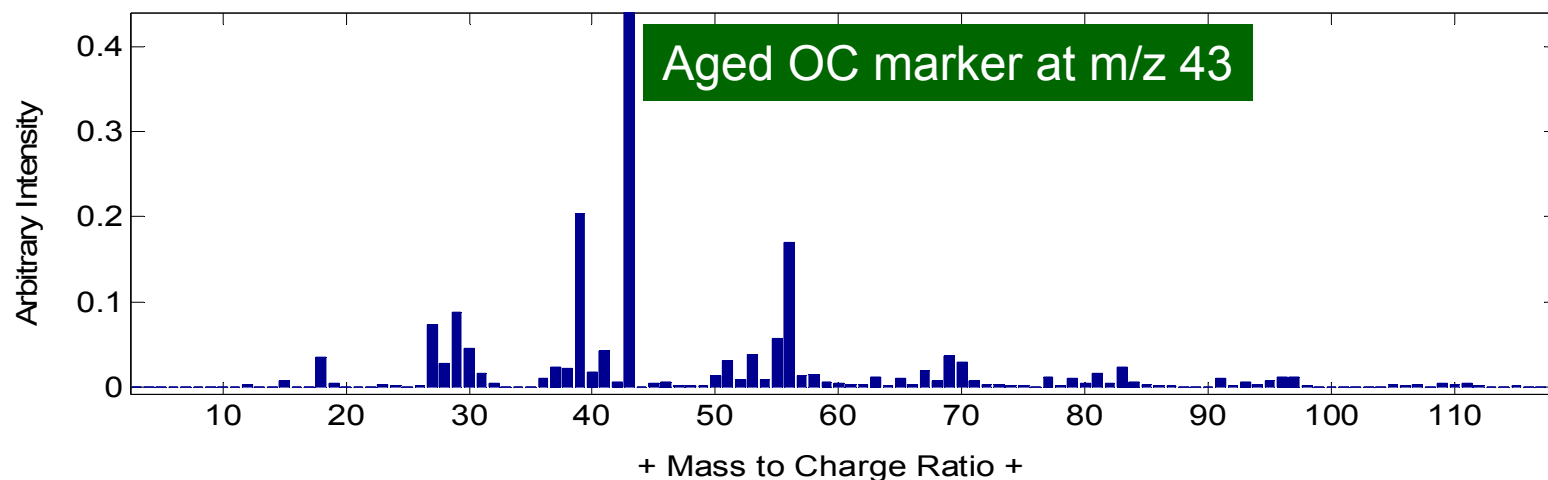


Preliminary 24 hour High Resolution Time Series, 3/15/2006
MILAGRO 2006, T0
University of Colorado, HR-ToF-AMS

Data courtesy of Allison Aiken and Jose Jimenez

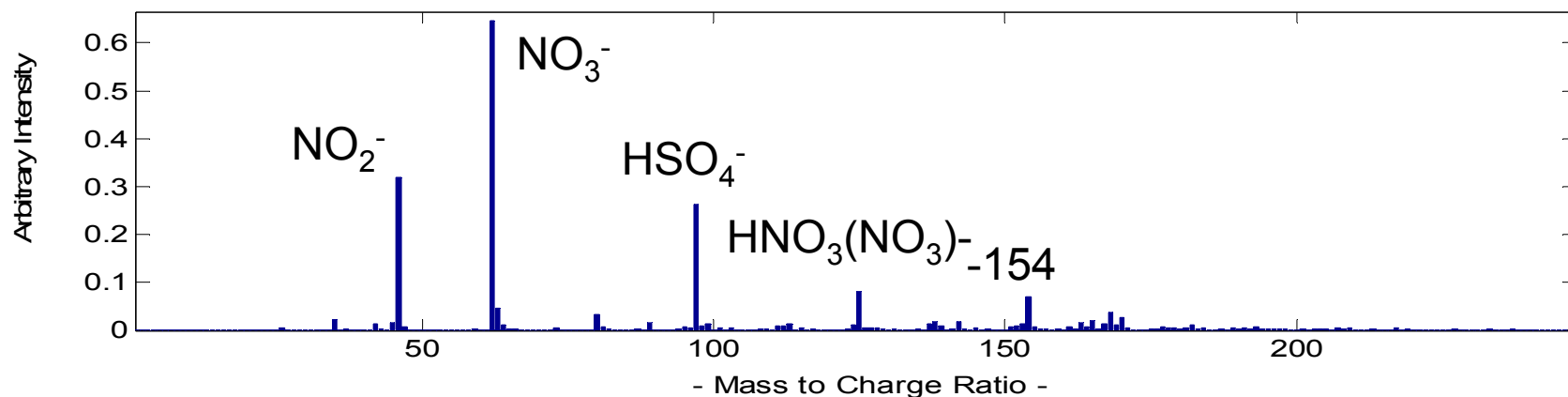
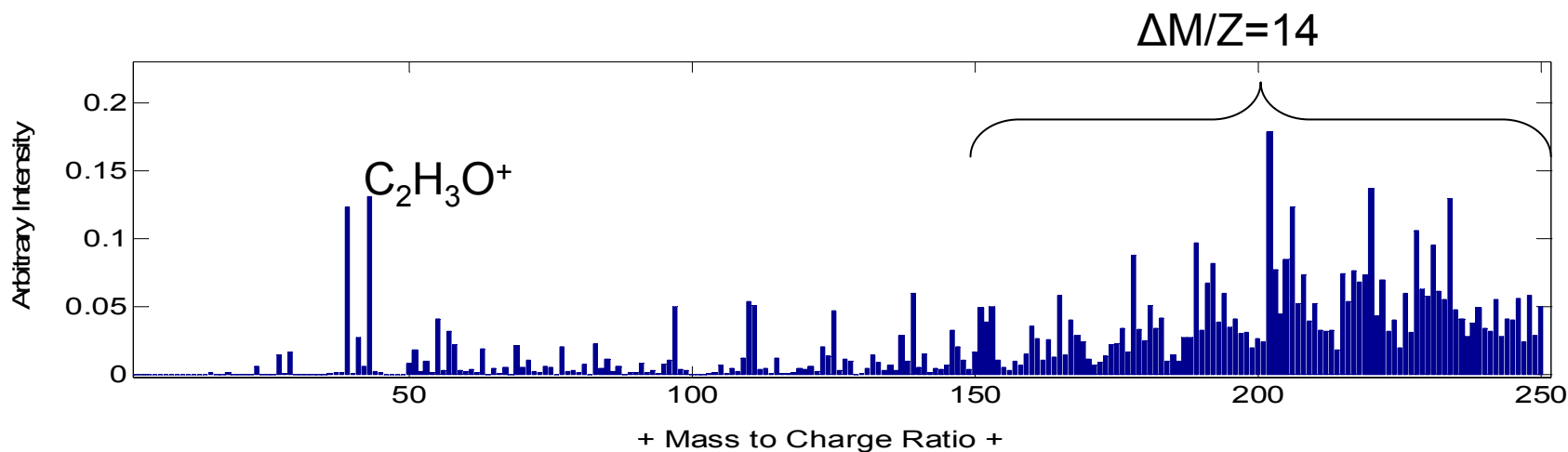
High Mass Organics

Olilgomeric Species? Negative Ions



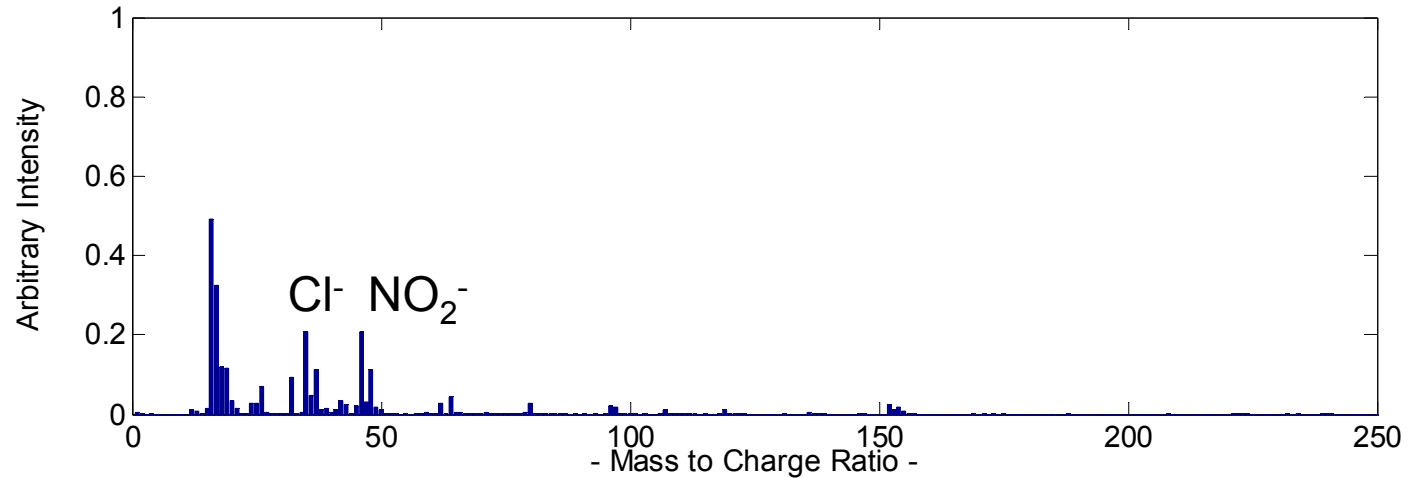
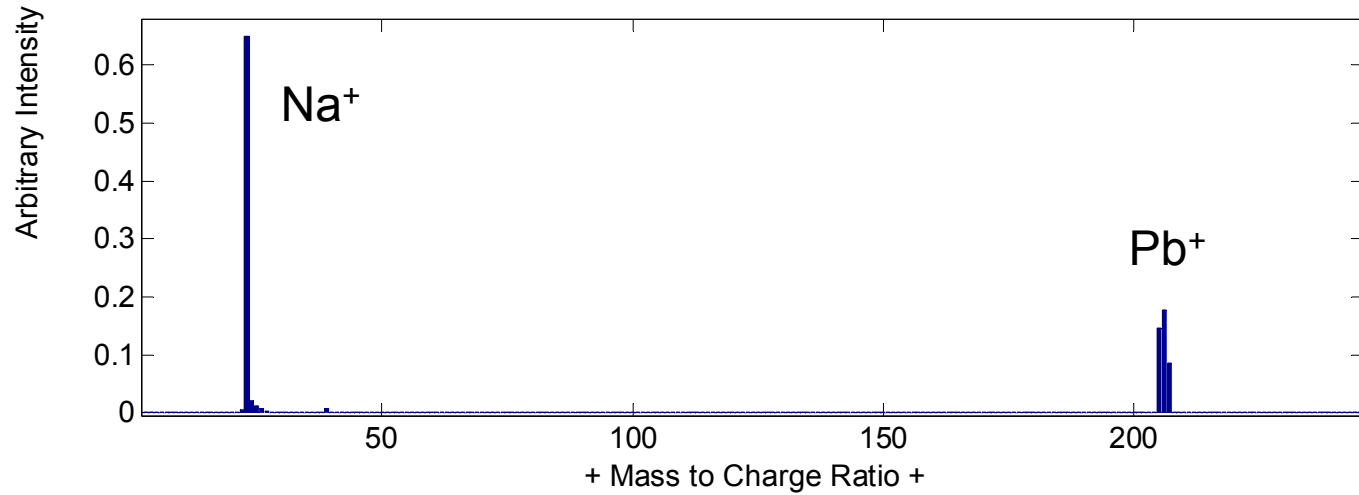
Oligomers? PAHs?

Positive Ions

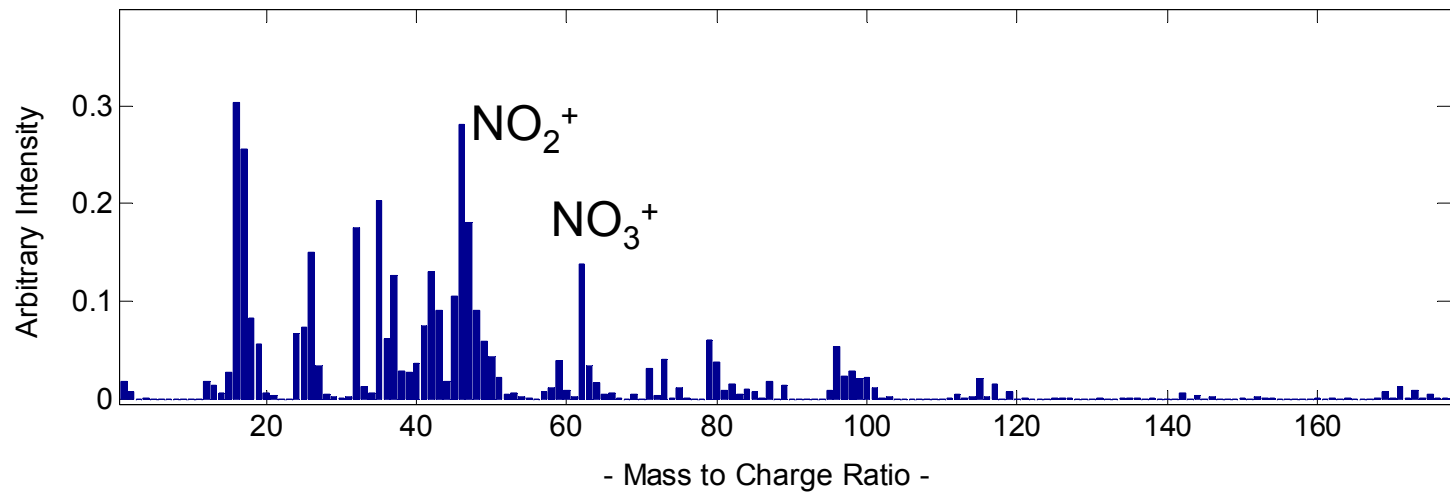
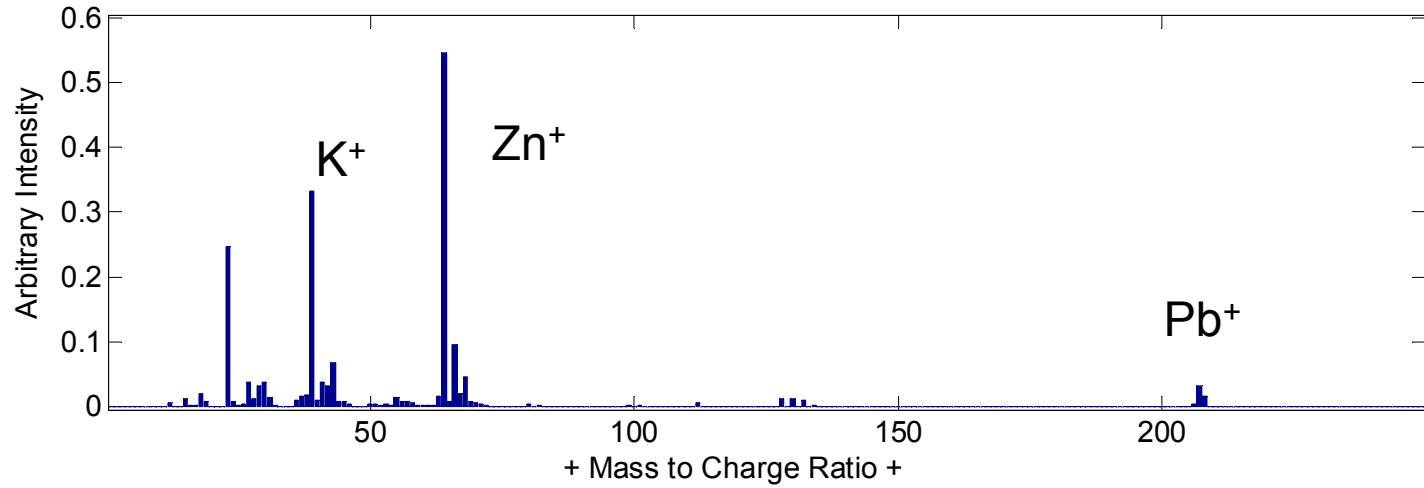


Lead Particles

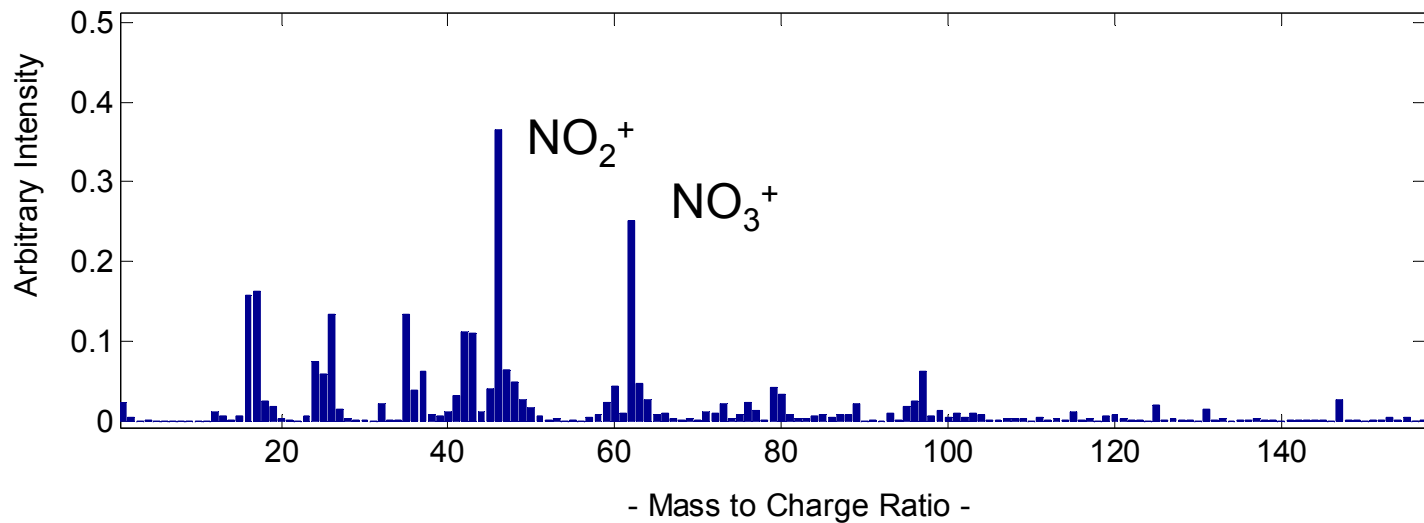
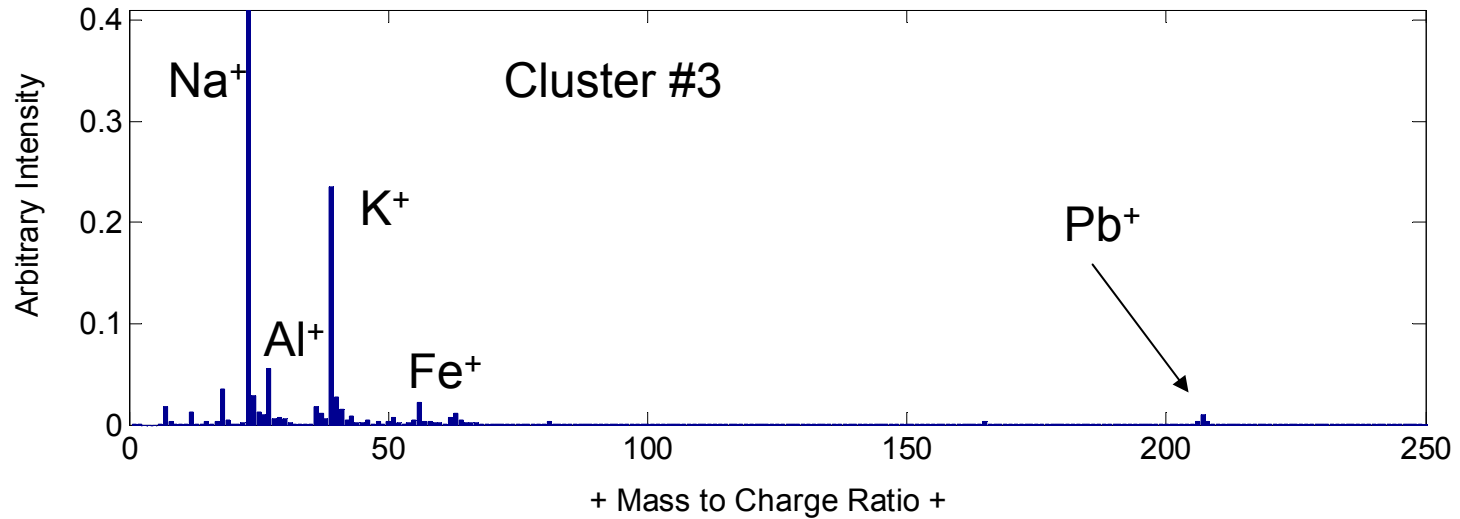
Pb/Na Type



Pb/Al/Zn



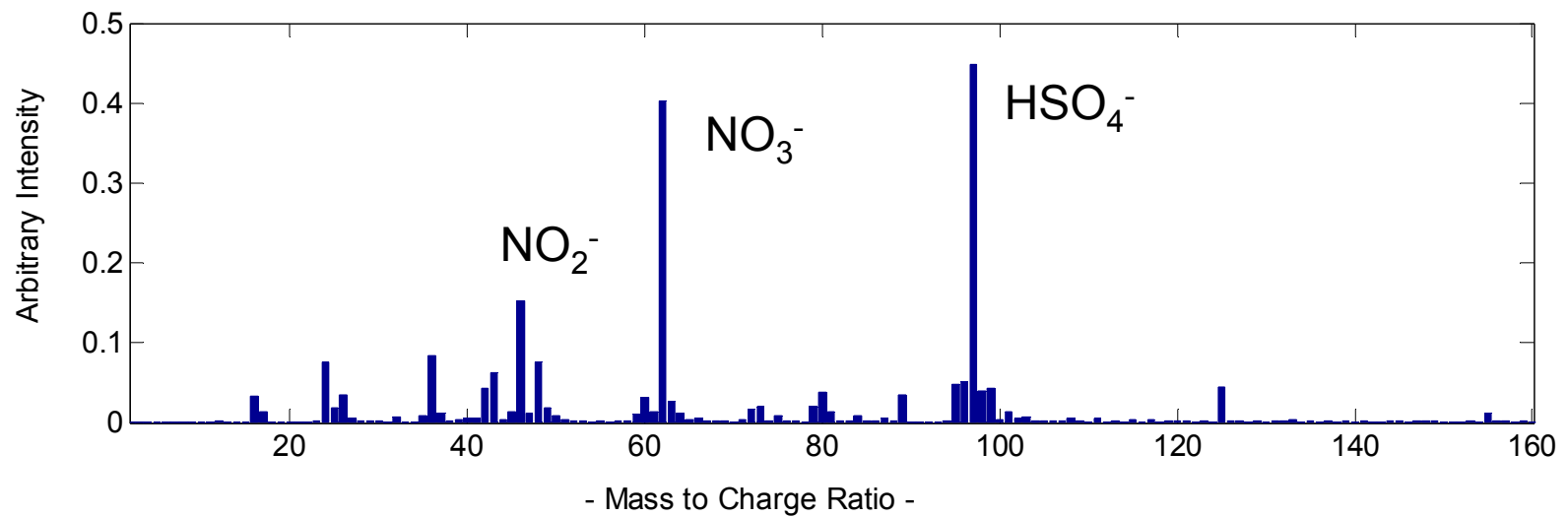
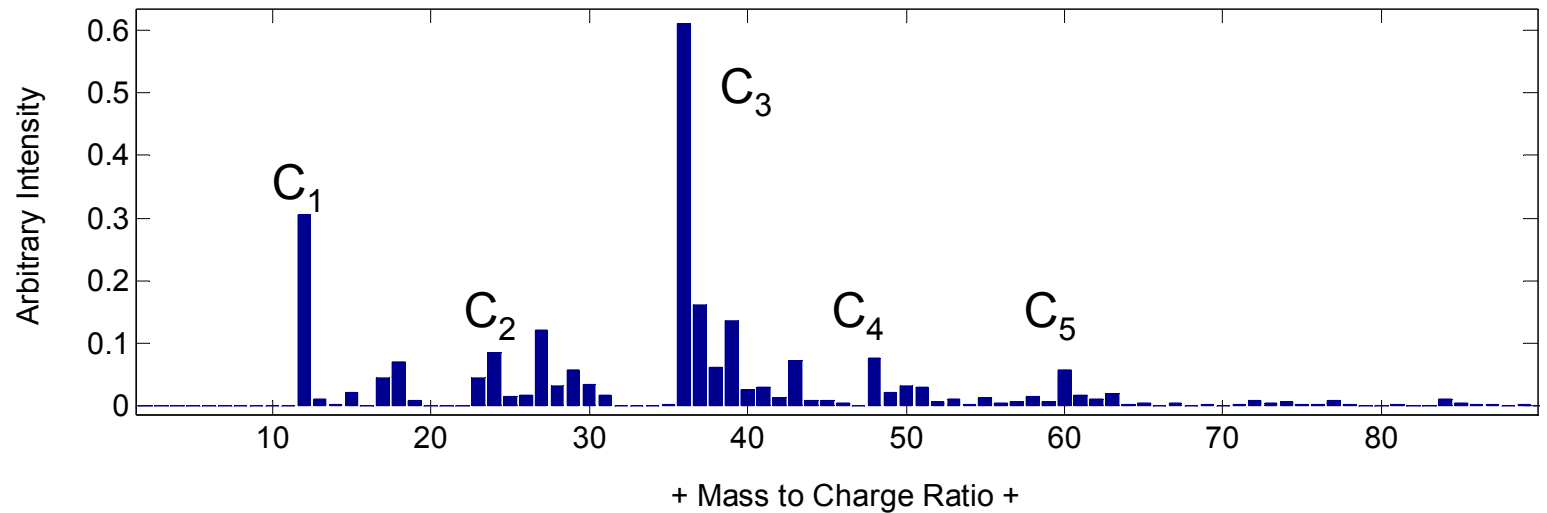
Pb in Other Clusters...



Fresh Carbonaceous

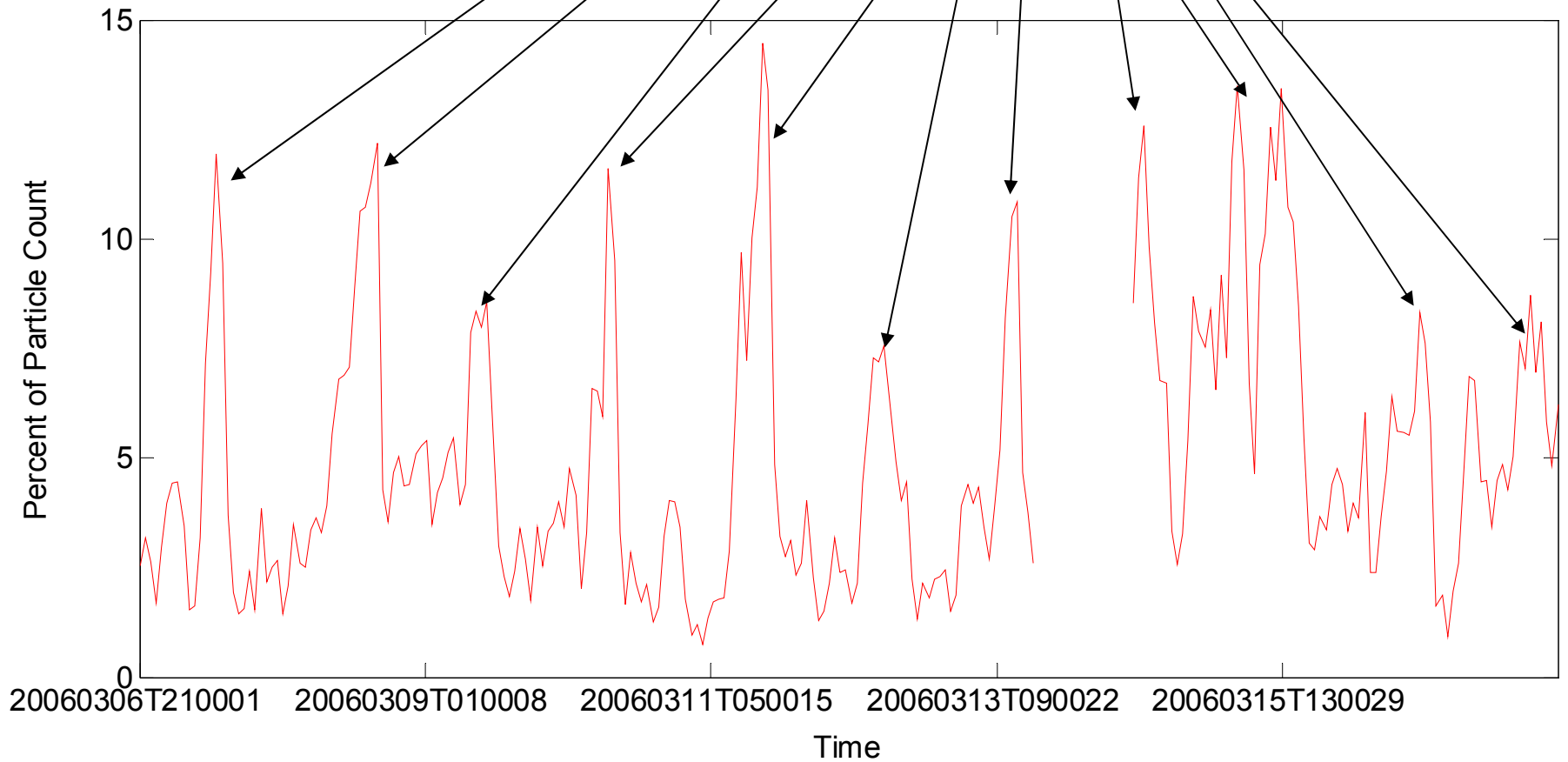
These are EC particles!

“Fresh” EC MS



Fresh EC

Peaks Occur in the Late Morning



Future Work

- Trajectory analysis for Pb and other species with well defined temporals
- More detailed analysis of EC and OC (inter-comparison with gas phase etc)
- Optical property retrievals

Thanks!

- Kim Prather
- Allison Aiken
- Jose Jimenez
- Rainer Volkamer
- Luisa Molina
- Mario Molina