SP-AMS:

Same ol’ AMS,
but a whole new world...

Onasch, Trimborn, Fortner, Cross,
Hunter, Massoli, Jayne, Williams, Kok,
Kroll, Davidovits, Worsnop
Ambient Results
Ambient Results II

- (a) Graph showing concentrations of different chemical species over time.
- (b) Graph highlighting the Org dominated plume.
- (c) Graph showing the rBC dominated plume.
- (d) Graph indicating the Fullerene signal with high and low fullerene plumes.

Dates and times are marked at the bottom of the graph:
- 12:00 AM 3/22/2008
- 12:00 PM 3/22/2008
- 12:00 AM 3/23/2008
- 12:00 PM 3/23/2008
Fresh Emissions vs Aged
rBC Source ‘Finger Prints’
Diesel Engine Test

DPF = Diesel Particulate Filter

Cross et al., 2011
## DPF Poisoned by Ash

<table>
<thead>
<tr>
<th></th>
<th>Fuel</th>
<th>ASTM D5185</th>
</tr>
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<tbody>
<tr>
<td>ULSD</td>
<td>&lt; 97</td>
<td>&lt; 56</td>
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</table>

## Lubricant-derived ash emissions from additives to oil

<table>
<thead>
<tr>
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<th>Lubricant</th>
<th>ASTM D5185</th>
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</thead>
<tbody>
<tr>
<td>CJ-4</td>
<td>586</td>
<td>1388</td>
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</table>

*Cross et al., 2011*
Diesel Exhaust Spectrum

Hydrocarbon and Black Carbon m/z Peaks

Additive-Derived m/z peaks

Cross et al., 2011
Test Diesel Combustor

Cross et al., 2011