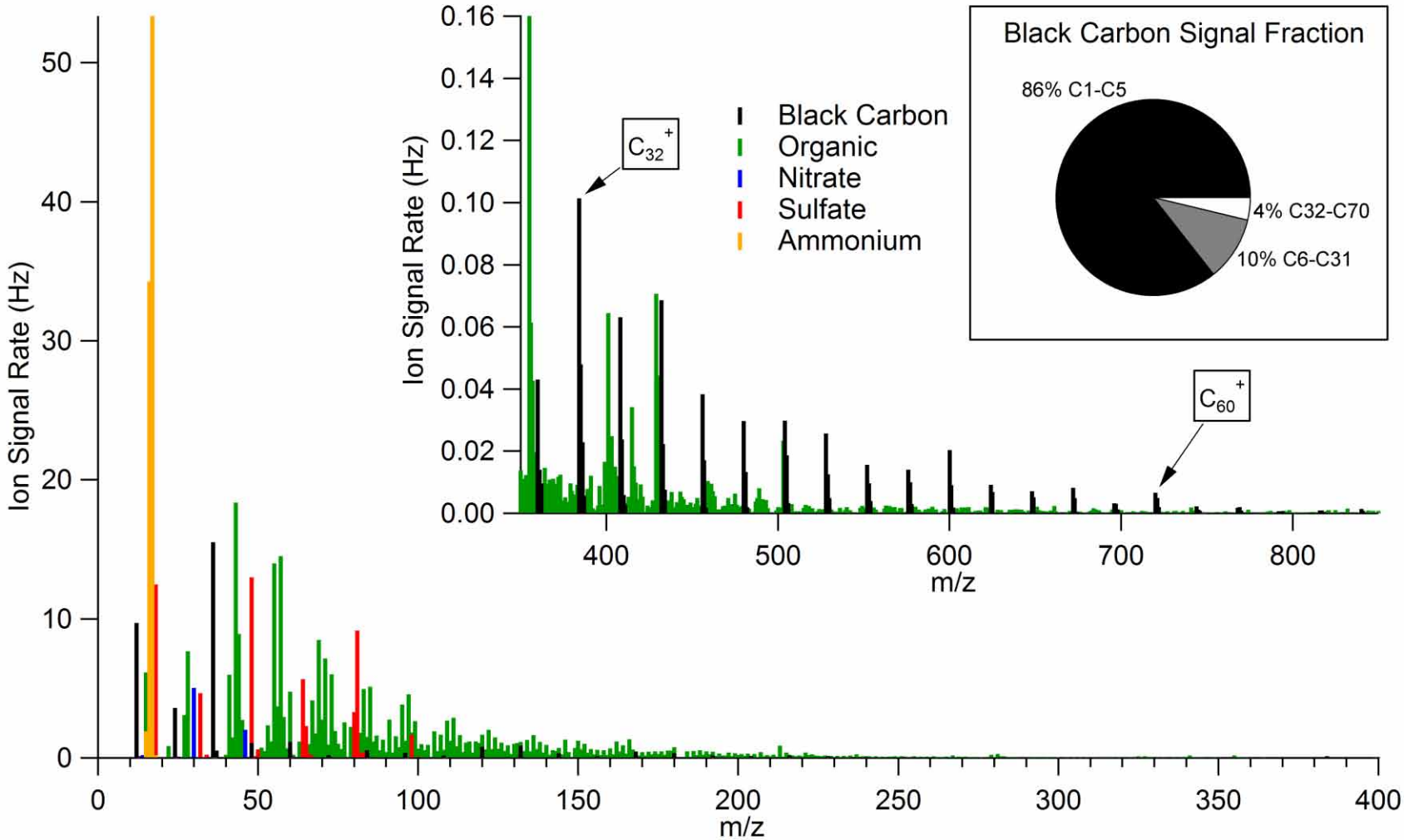
SP-AMS:

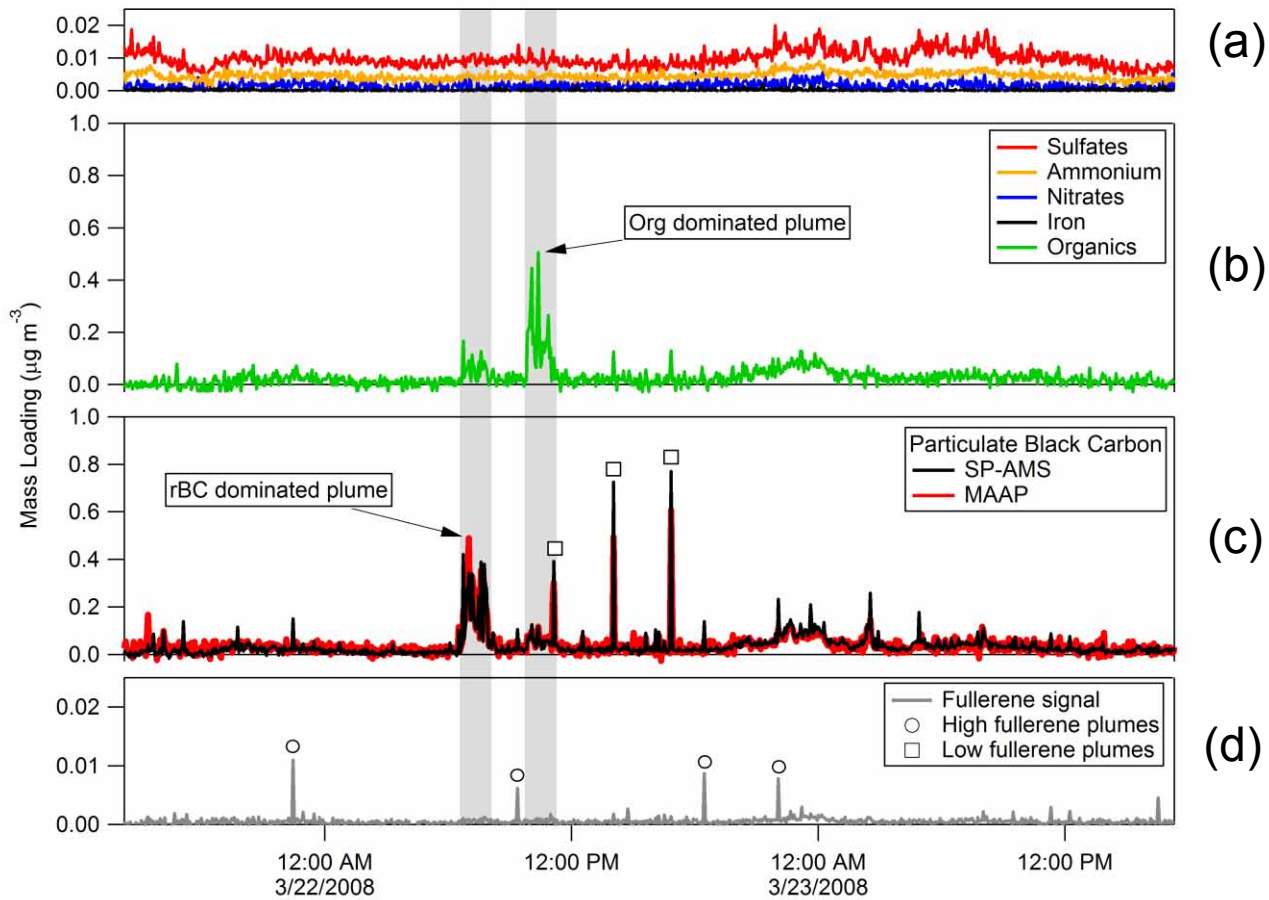
Same ol' AMS,
but a whole new world…

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

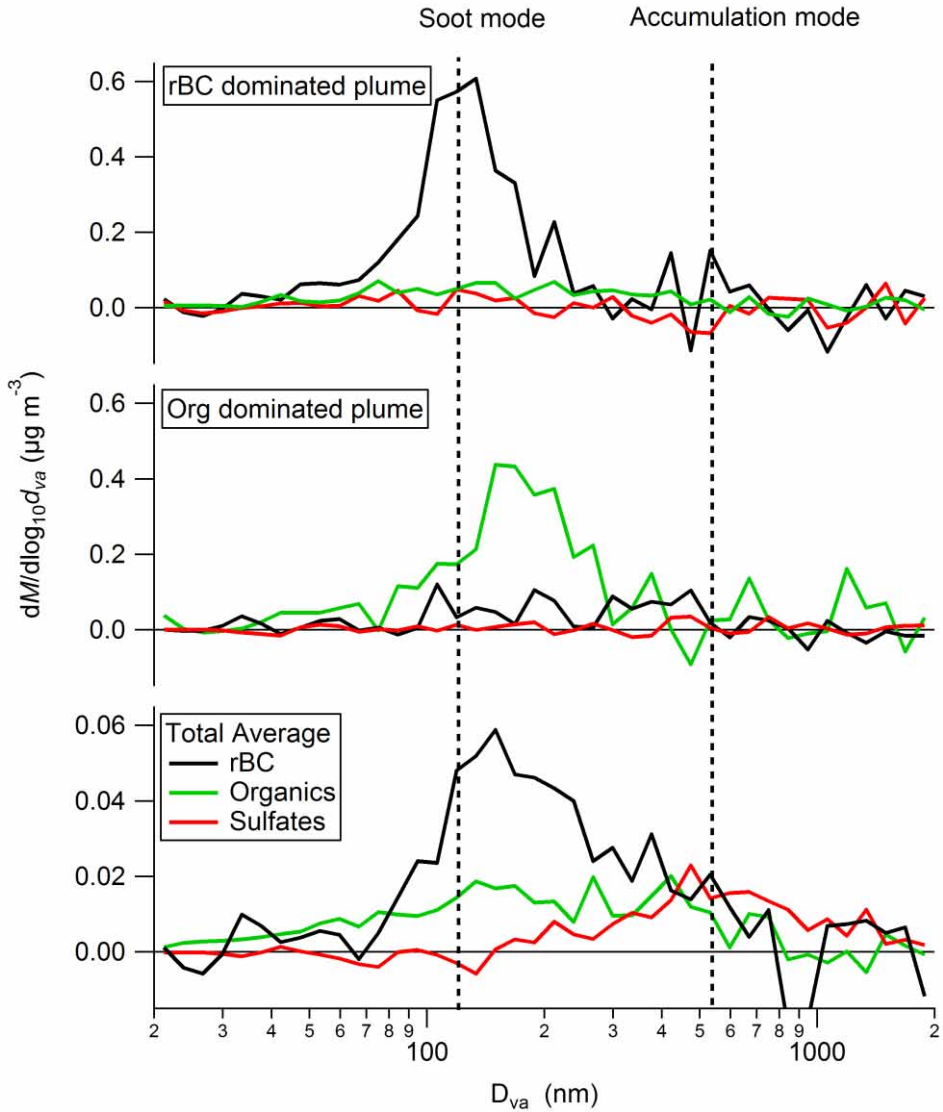
Ambient Results



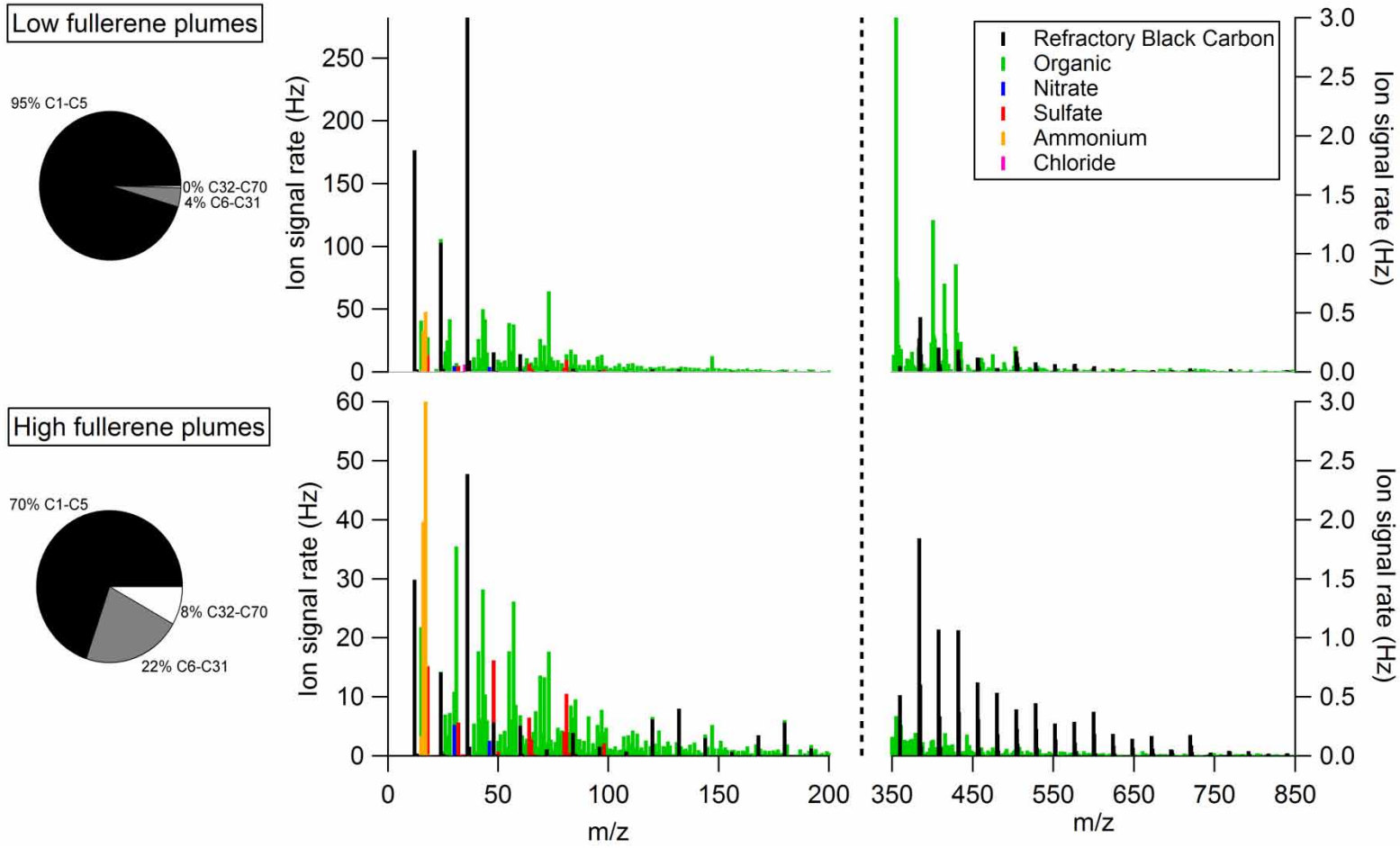
Ambient Results II



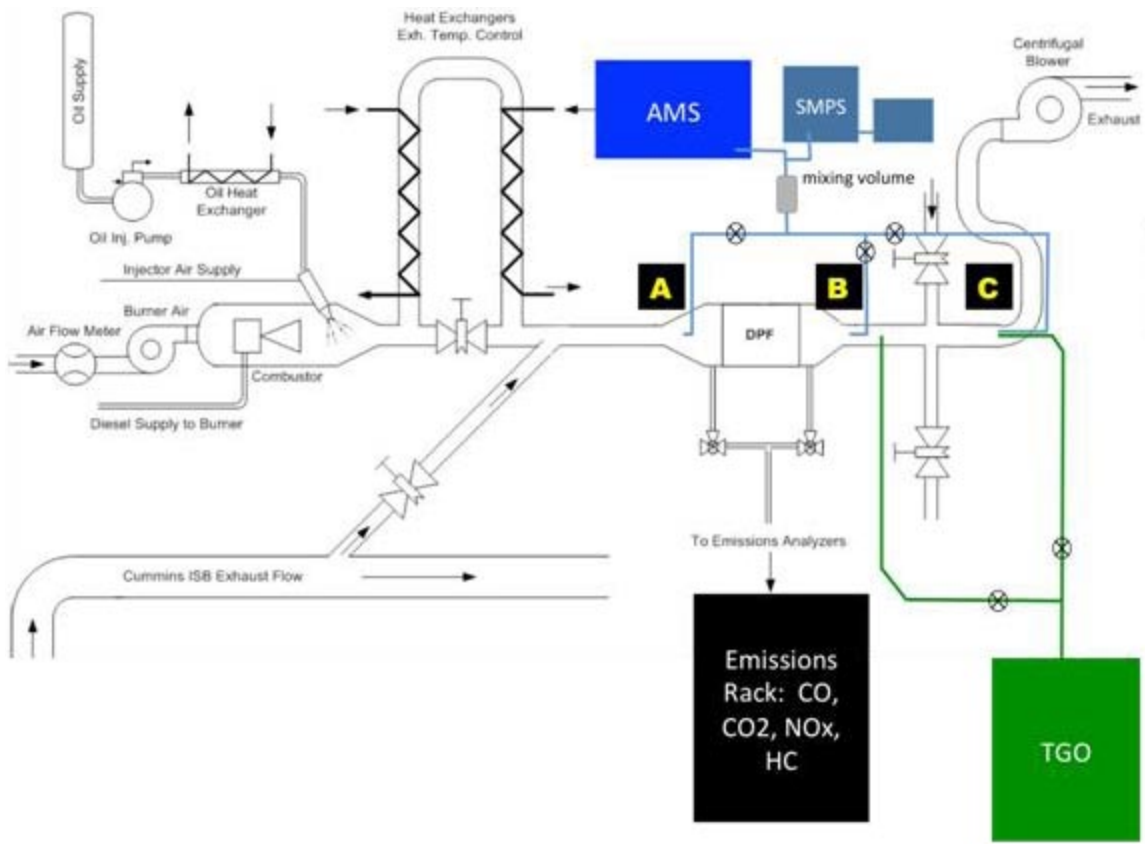
Fresh Emissions vs Aged



rBC Source ‘Finger Prints’



Diesel Engine Test



DPF = Diesel Particulate Filter

Cross et al., 2011

DPF Poisoned by Ash

FUEL

Fuel	ASTM D5185					
	Ca	Mg	P	Na	K	Zn
	[ppb]	[ppb]	[ppb]	[ppb]	[ppb]	[ppb]
ULSD	< 97	< 56	< 1180	< 2010	< 2690	< 155

OIL

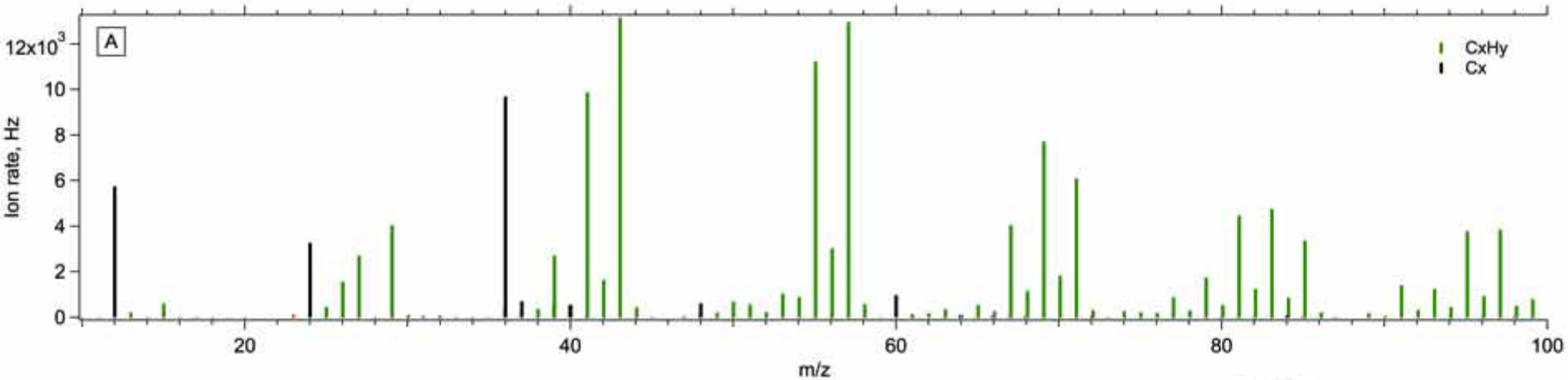
Lubricant	ASTM D5185							
	B	Ca	Fe	Mg	P	Zn	S	Mo
	[ppm]	[ppm]	[ppm]	[ppm]	[ppm]	[ppm]	[ppm]	[ppm]
CJ-4	586	1388	2	355	985	1226	3200*	77

Lubricant-derived ash emissions from additives to oil

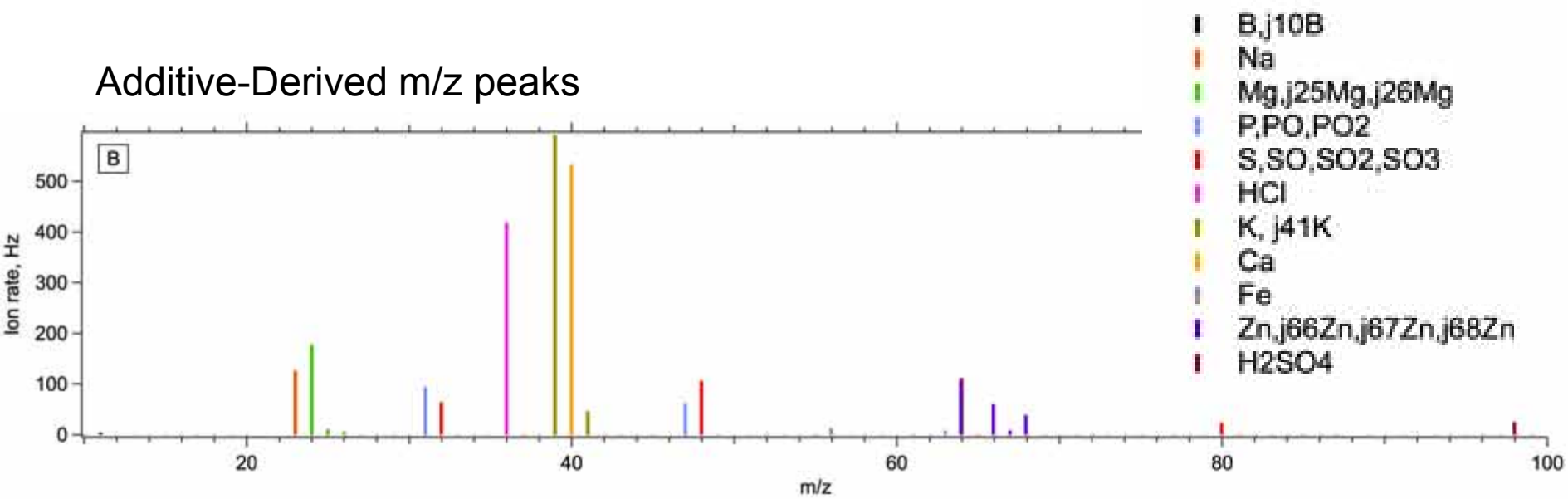
Cross et al., 2011

Diesel Exhaust Spectrum

Hydrocarbon and Black Carbon m/z Peaks

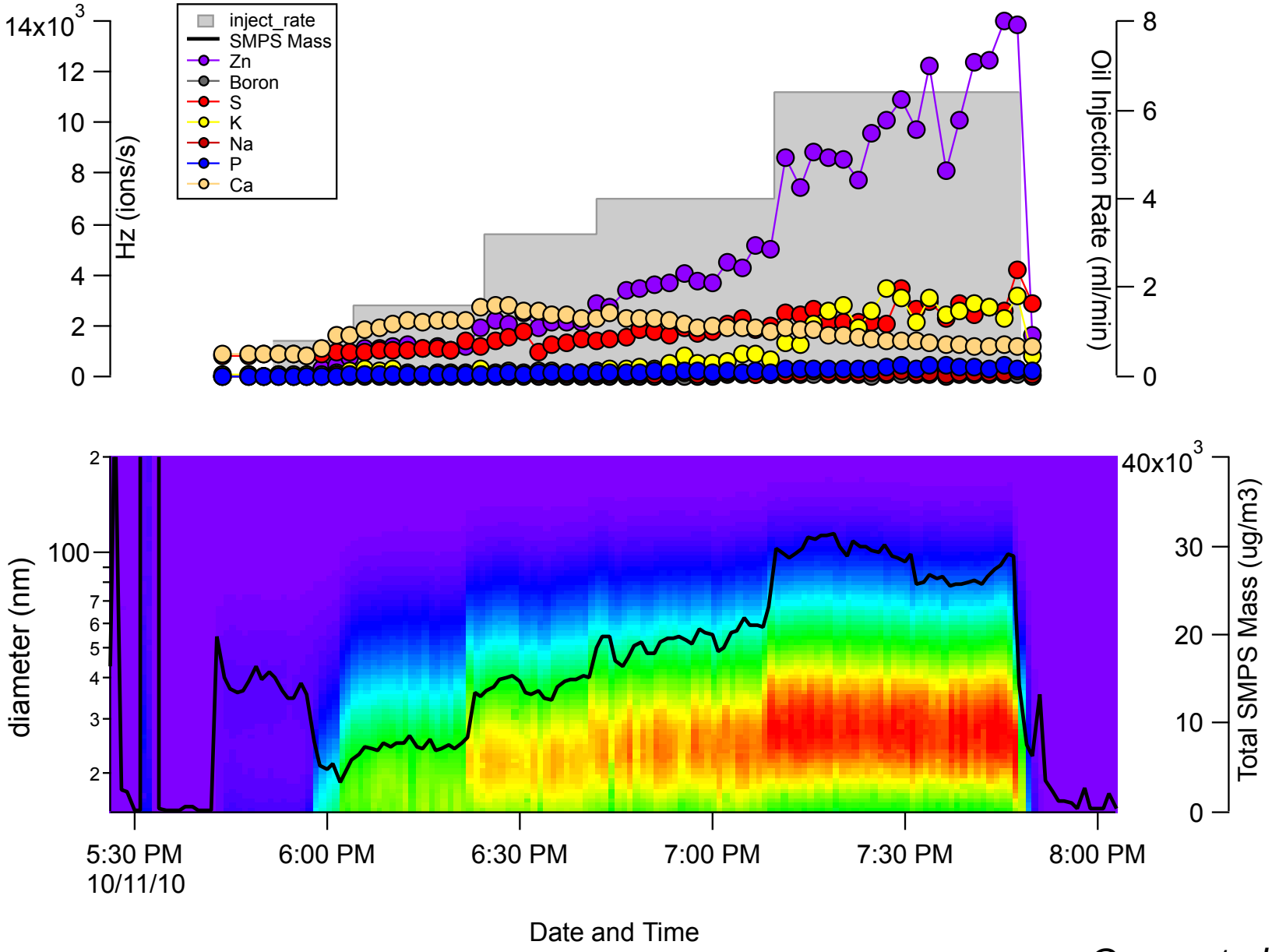


Additive-Derived m/z peaks



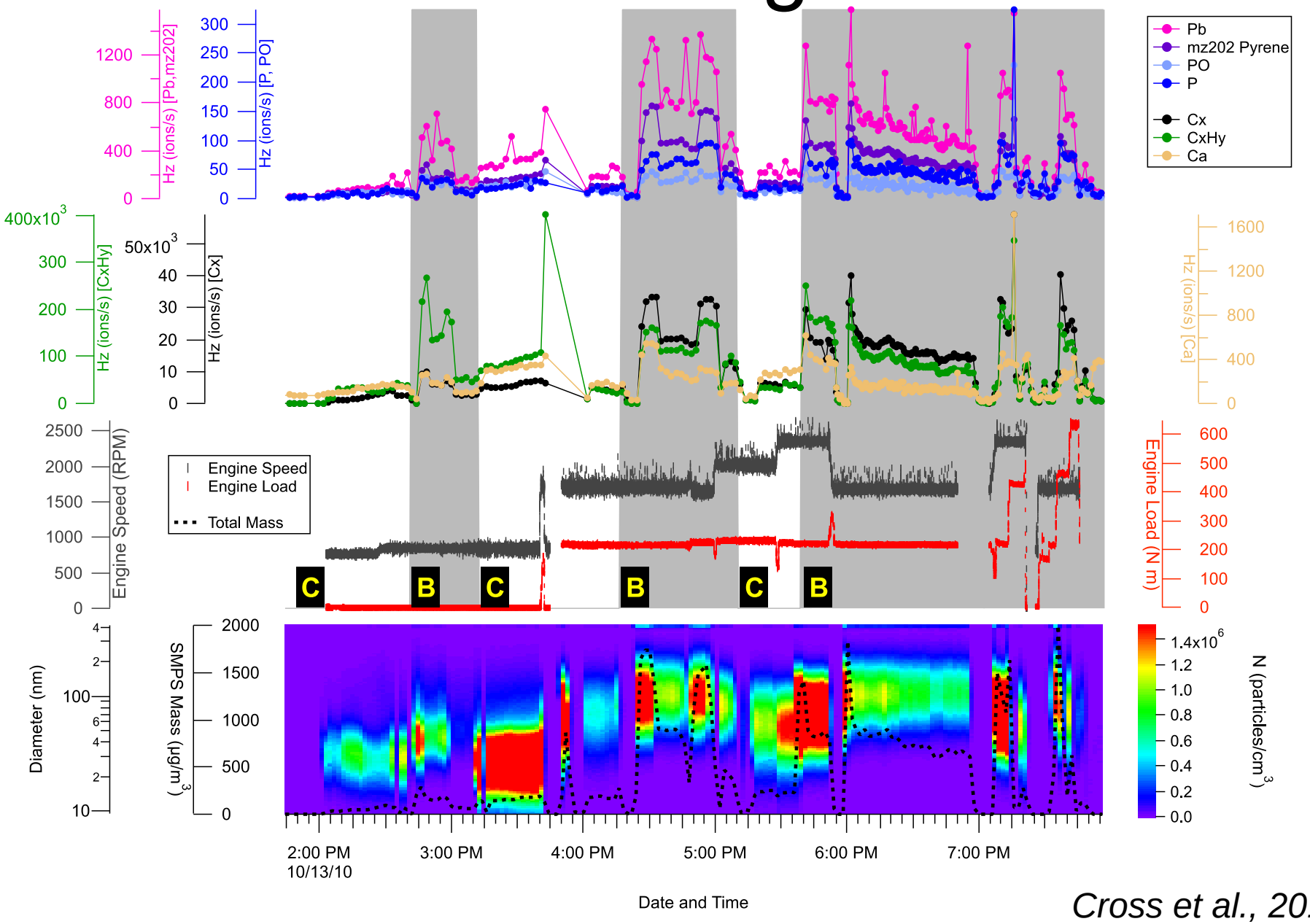
Cross et al., 2011

Test Diesel Combustor



Cross et al., 2011

Diesel Engine



Cross et al., 2011