

Aerosol properties measured during AIDA IN11

very much preliminary

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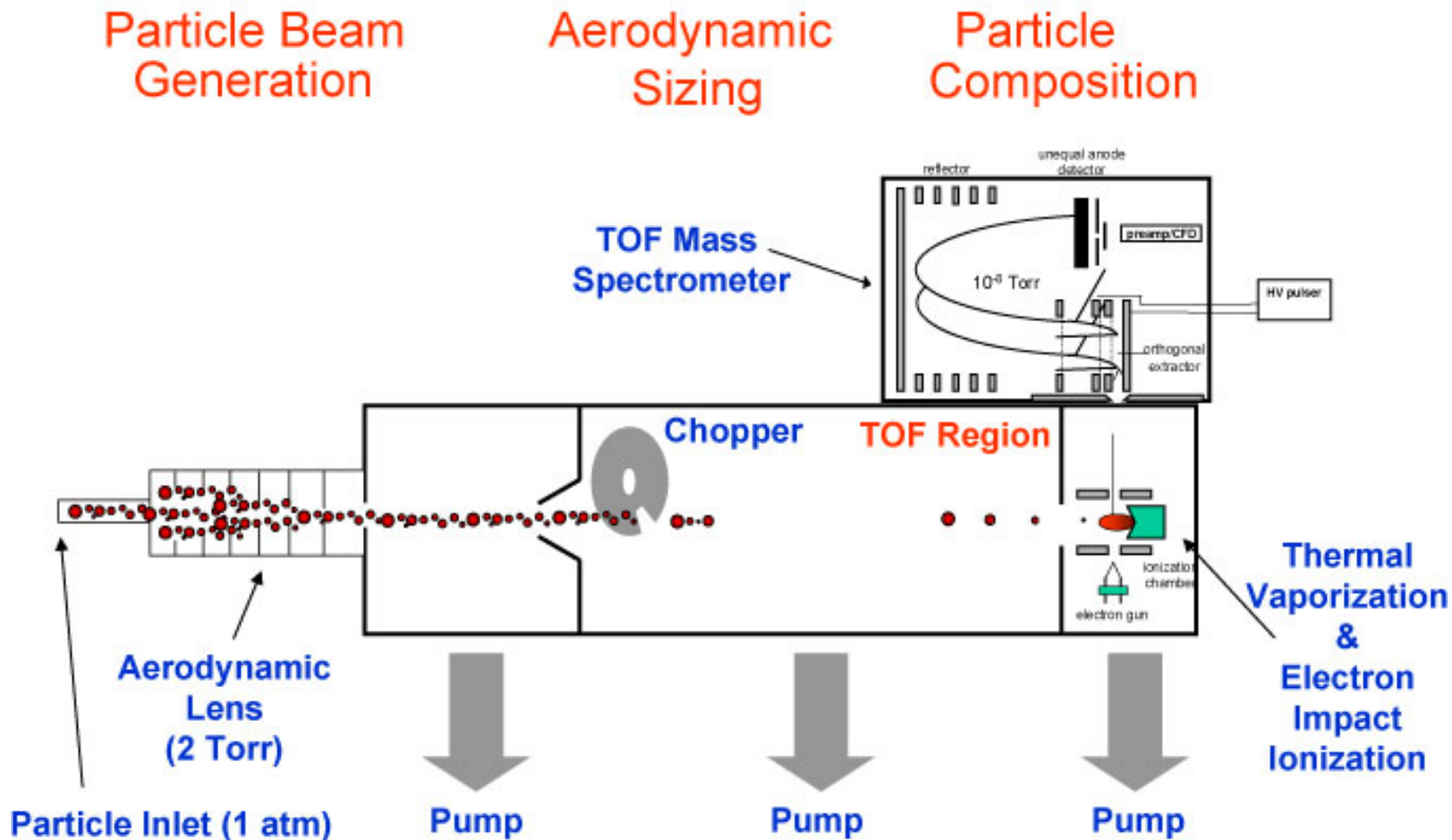
Instrumentation

HR-ToF-AMS – High Resolution Time of Flight Aerosol Mass Spectrometer

SP2 – Single Particle Soot Photometer

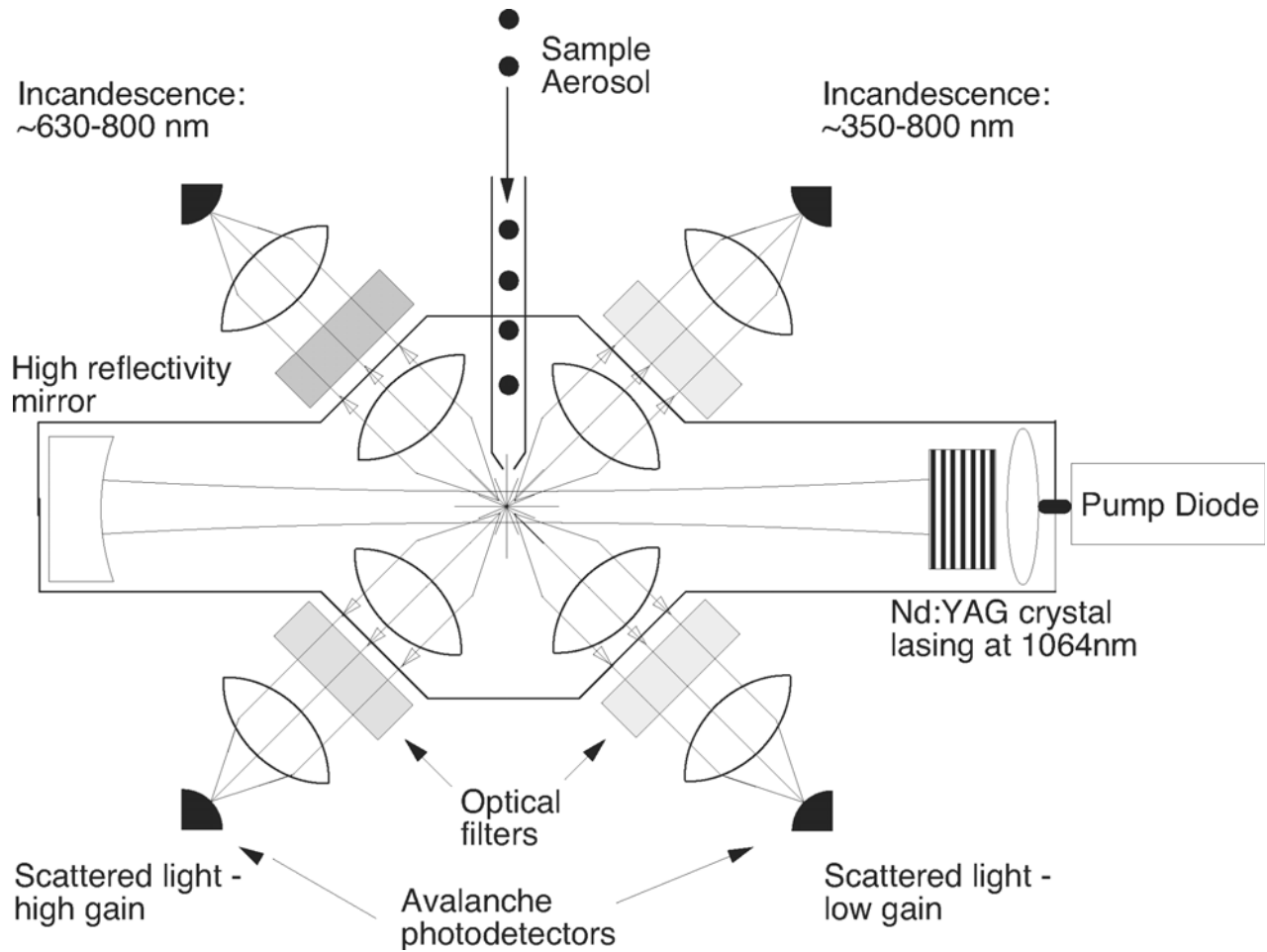
CPI – Cloud Particle Imager

AMS Schematic

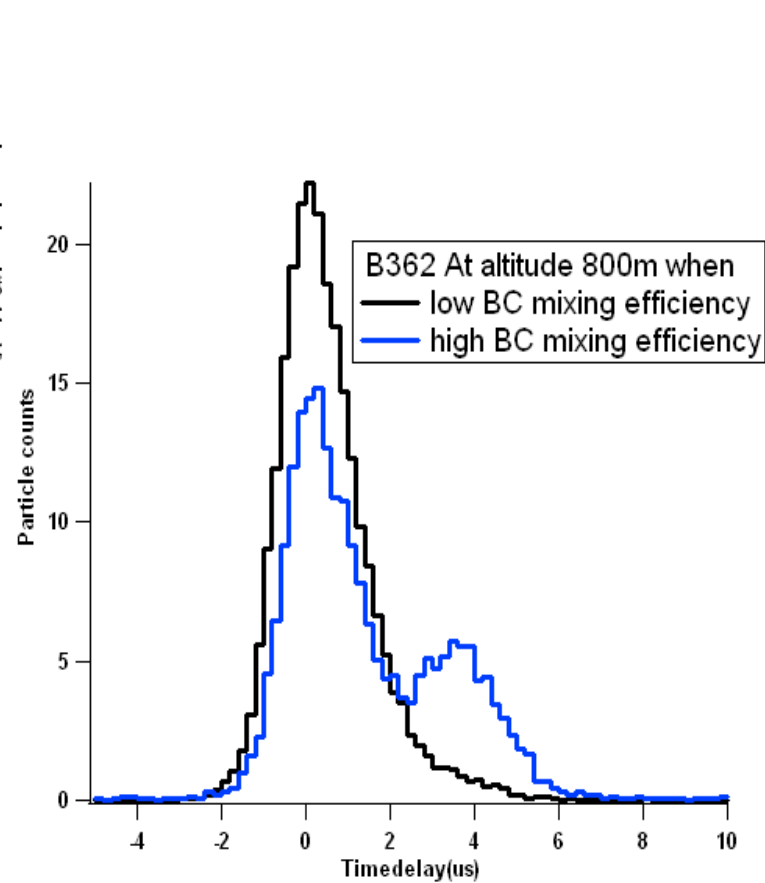
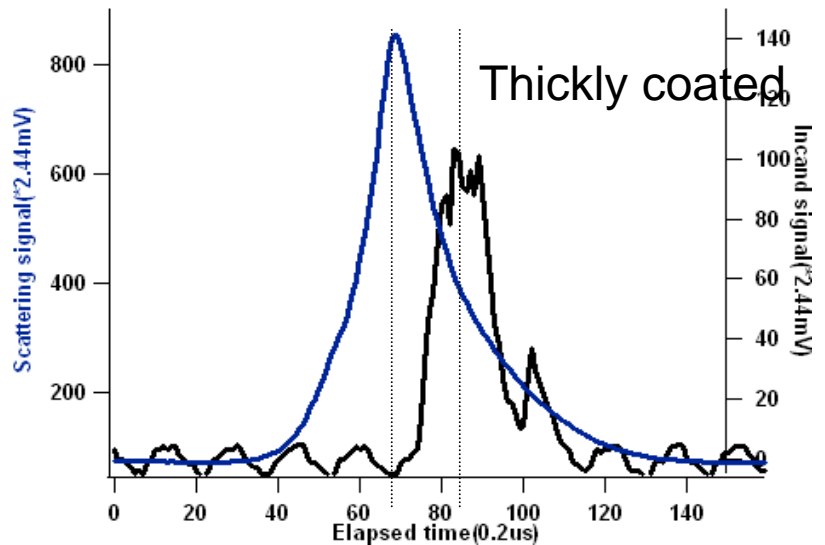
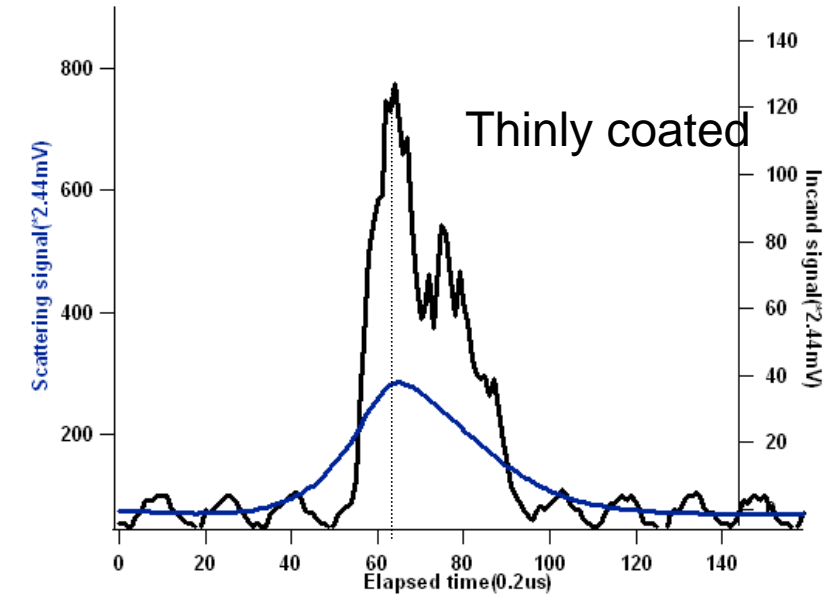


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SP2



SP2 – example data

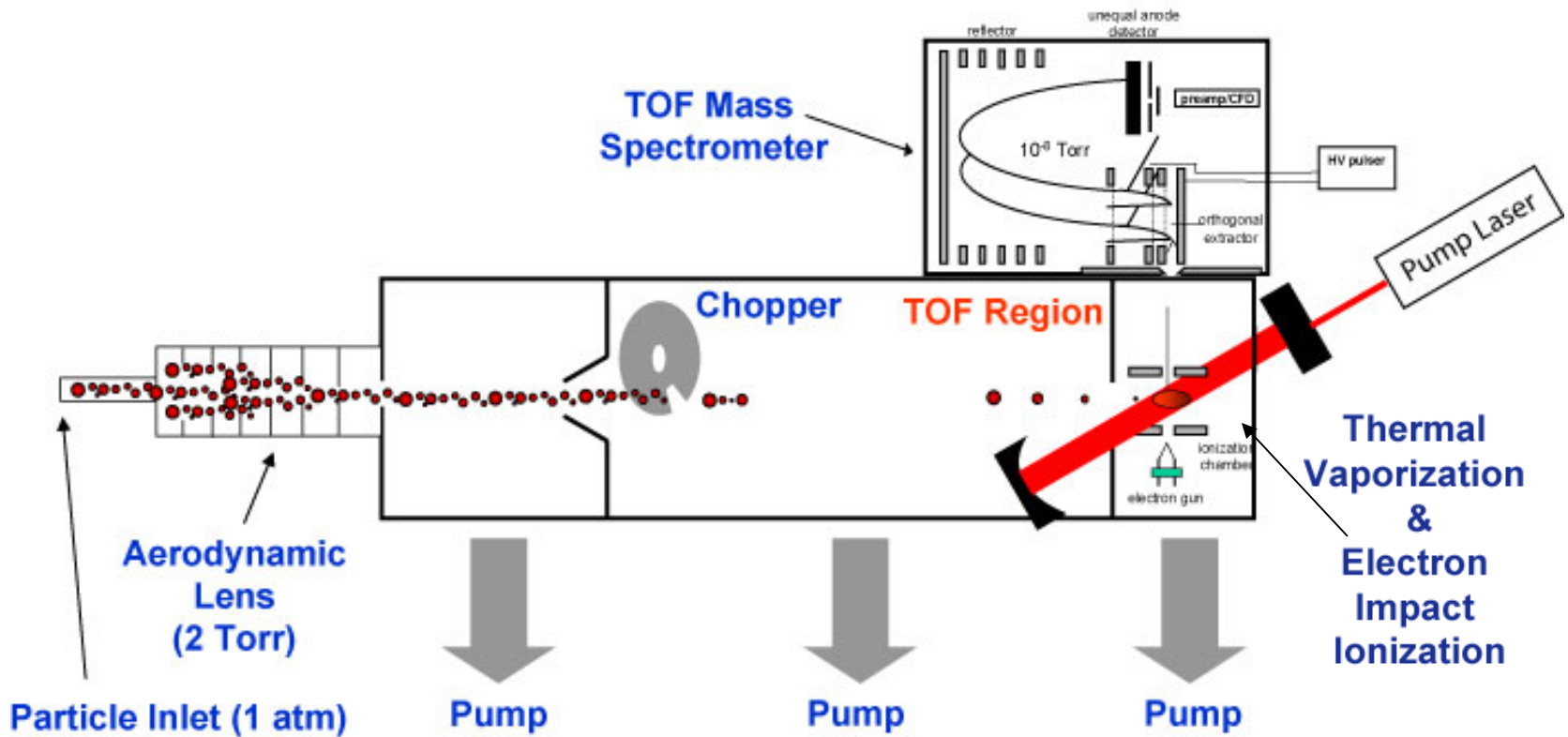


SP2-AMS

Particle Beam
Generation

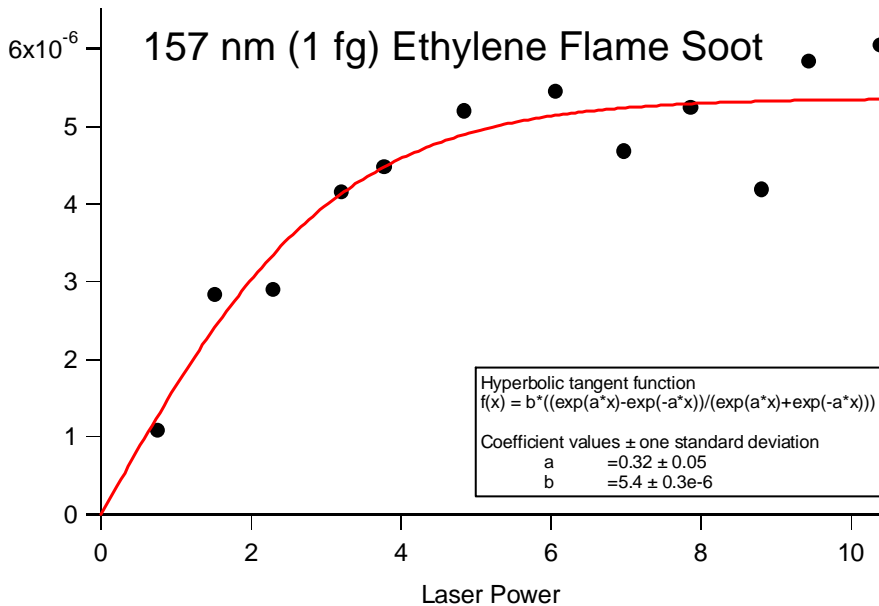
Aerodynamic
Sizing

Particle
Composition



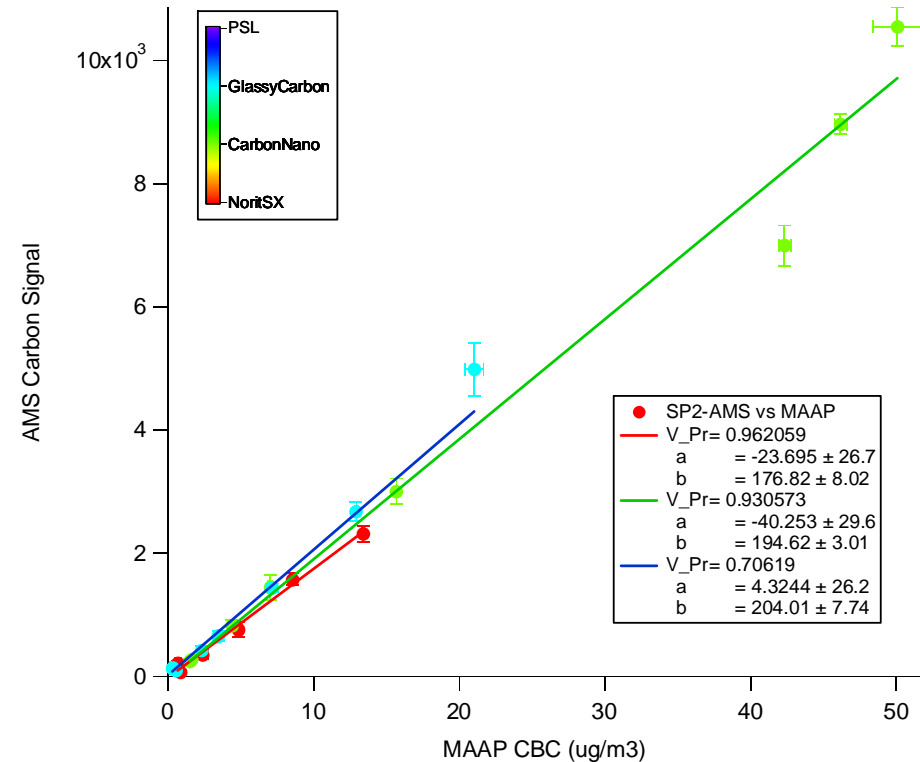
Quantification and Detection Limits

Carbon Signal vs Laser Power



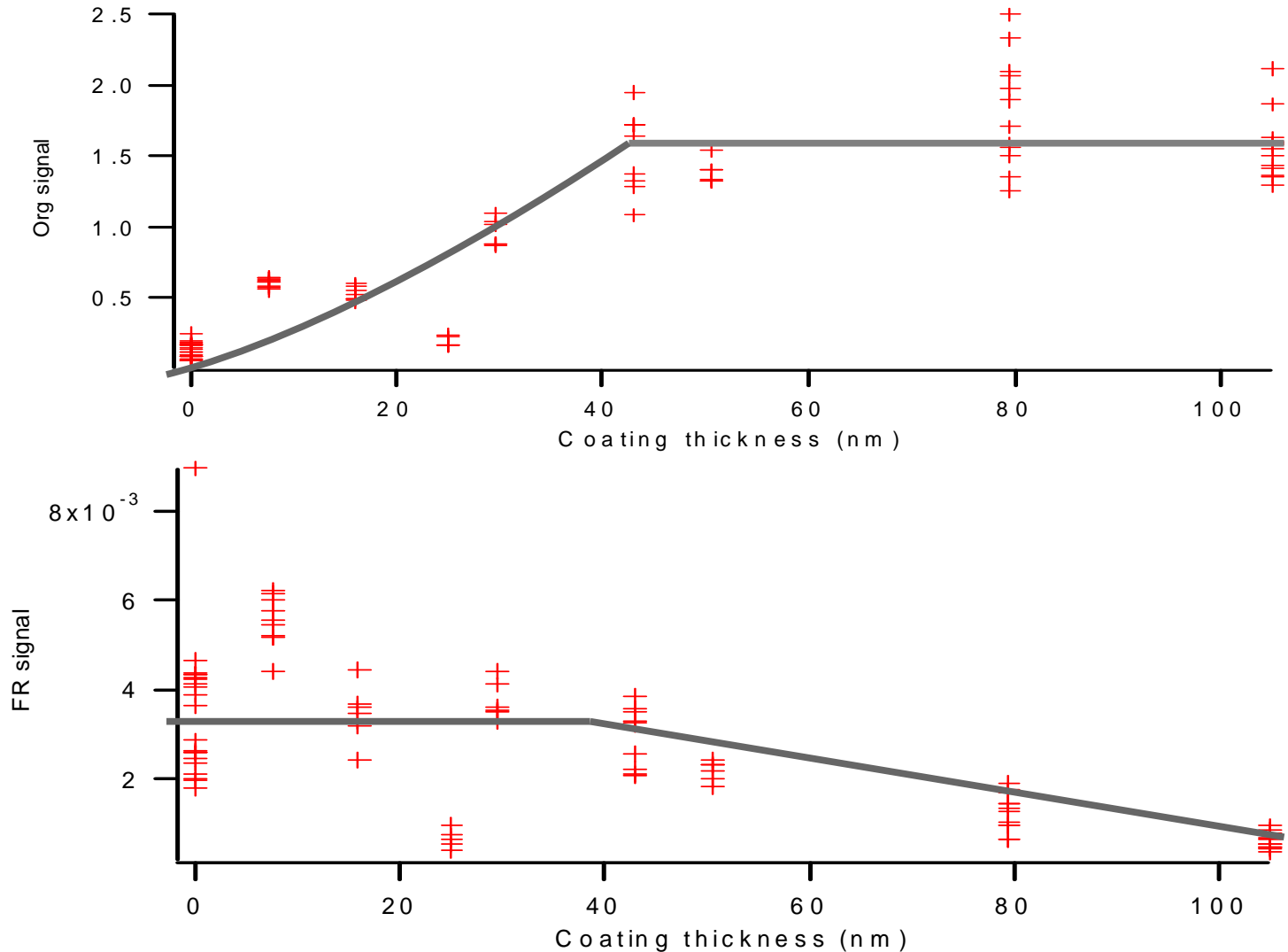
- SP2 instruments operate at laser powers of ~ 2
- Higher laser powers required in SP2AMS due to faster particle velocities

Carbon Signal vs MAAP CBC

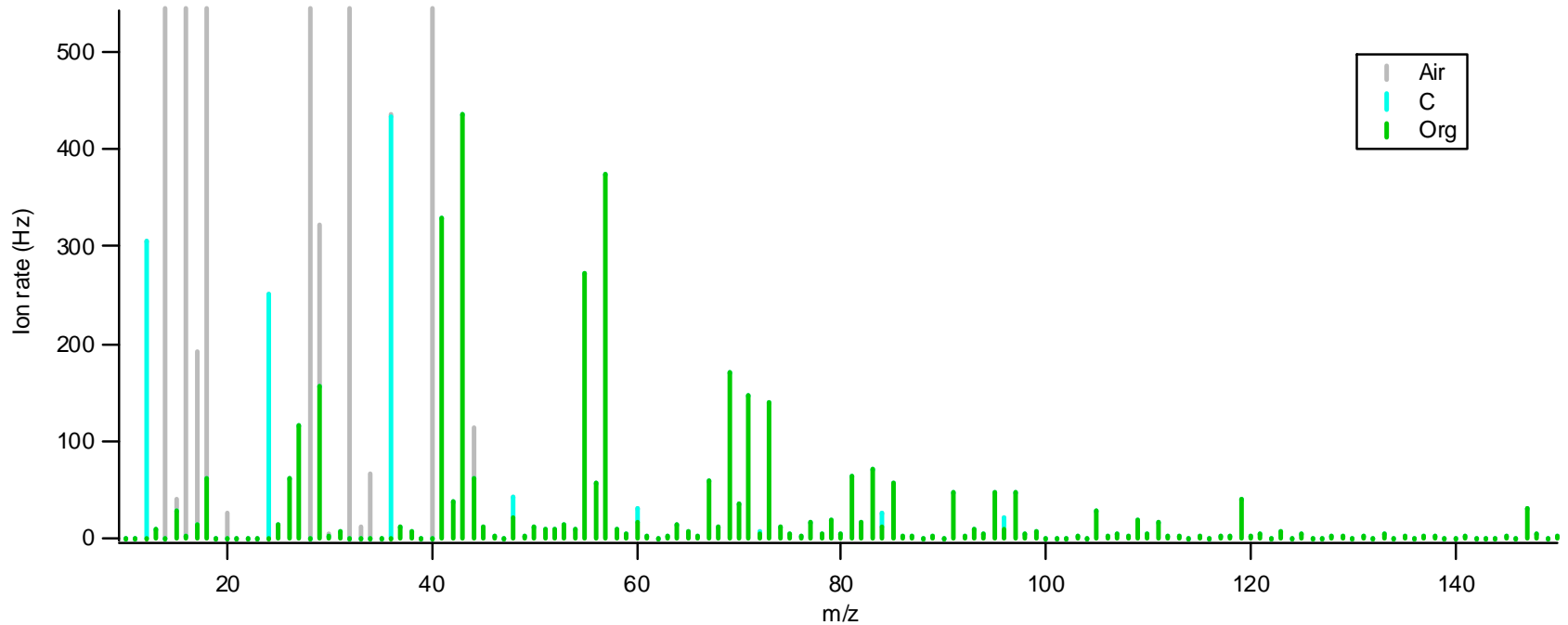


- Total carbon signal is constant for different monodisperse soot particles

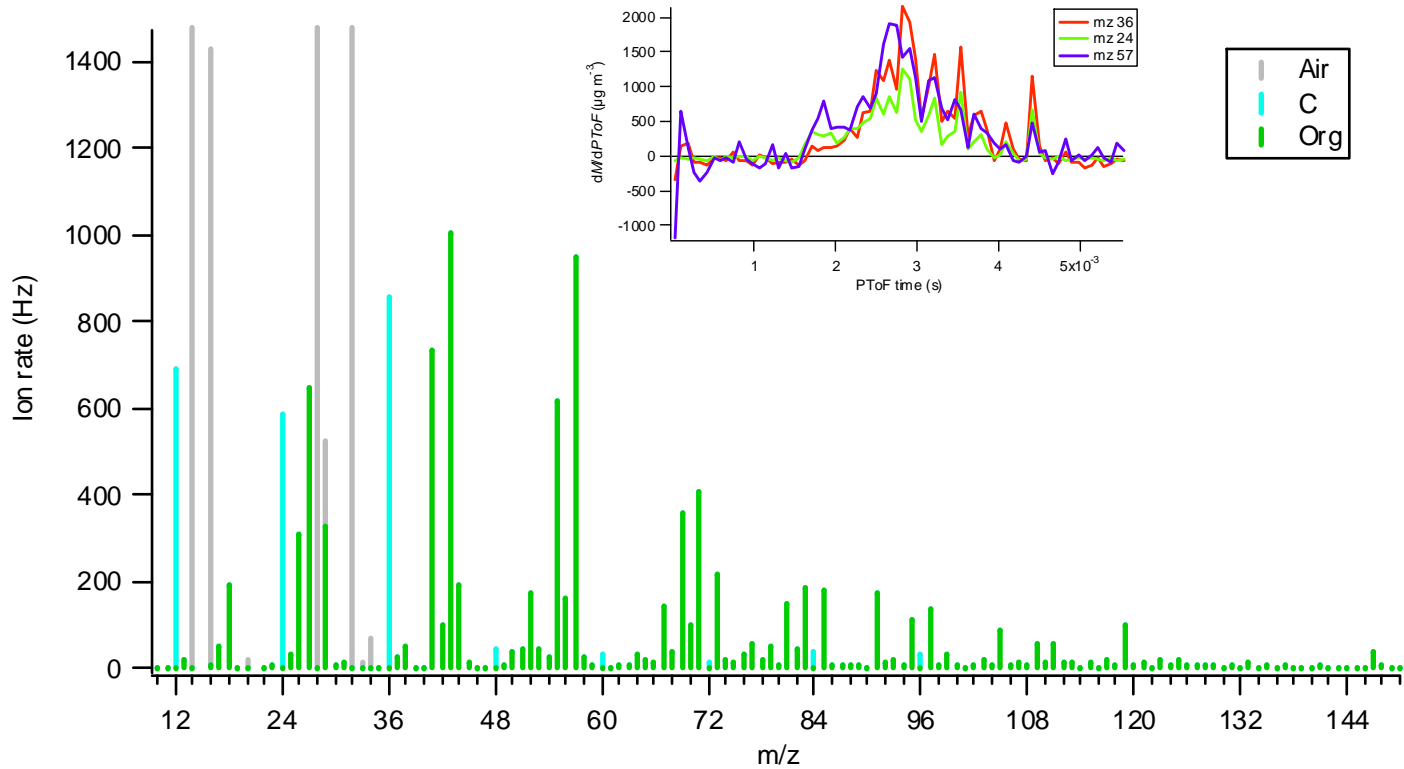
Signal vs coating thickness



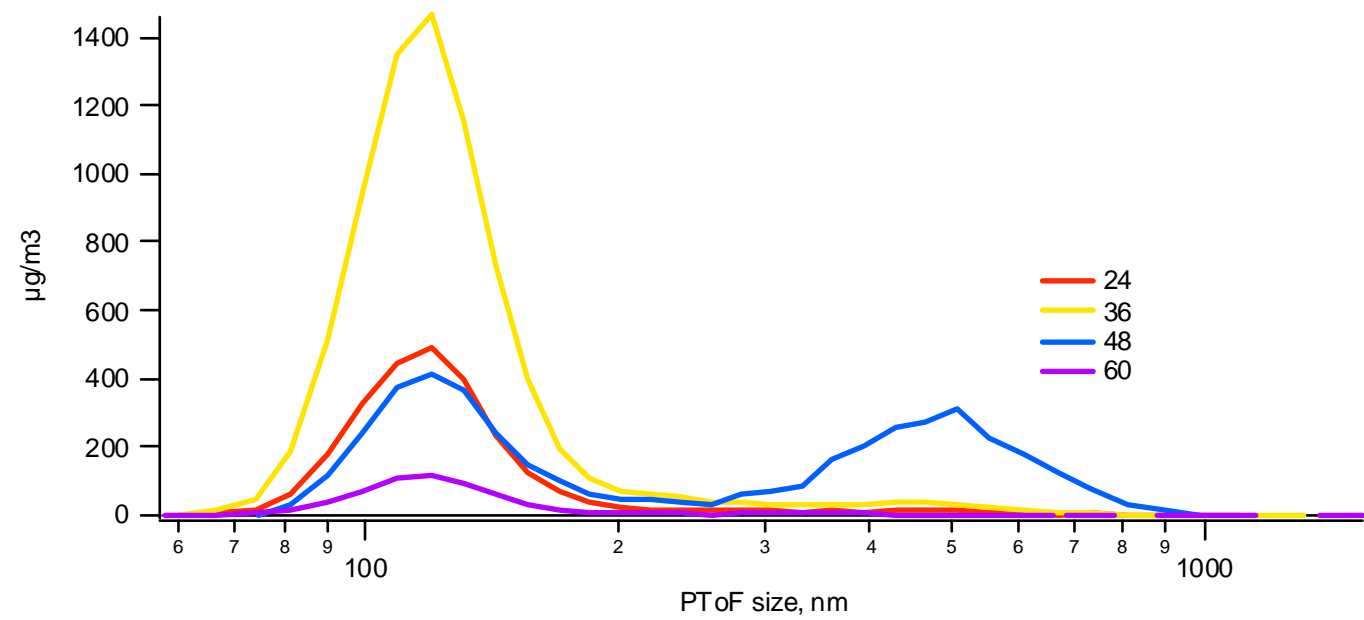
IN11 – GFG + Ar



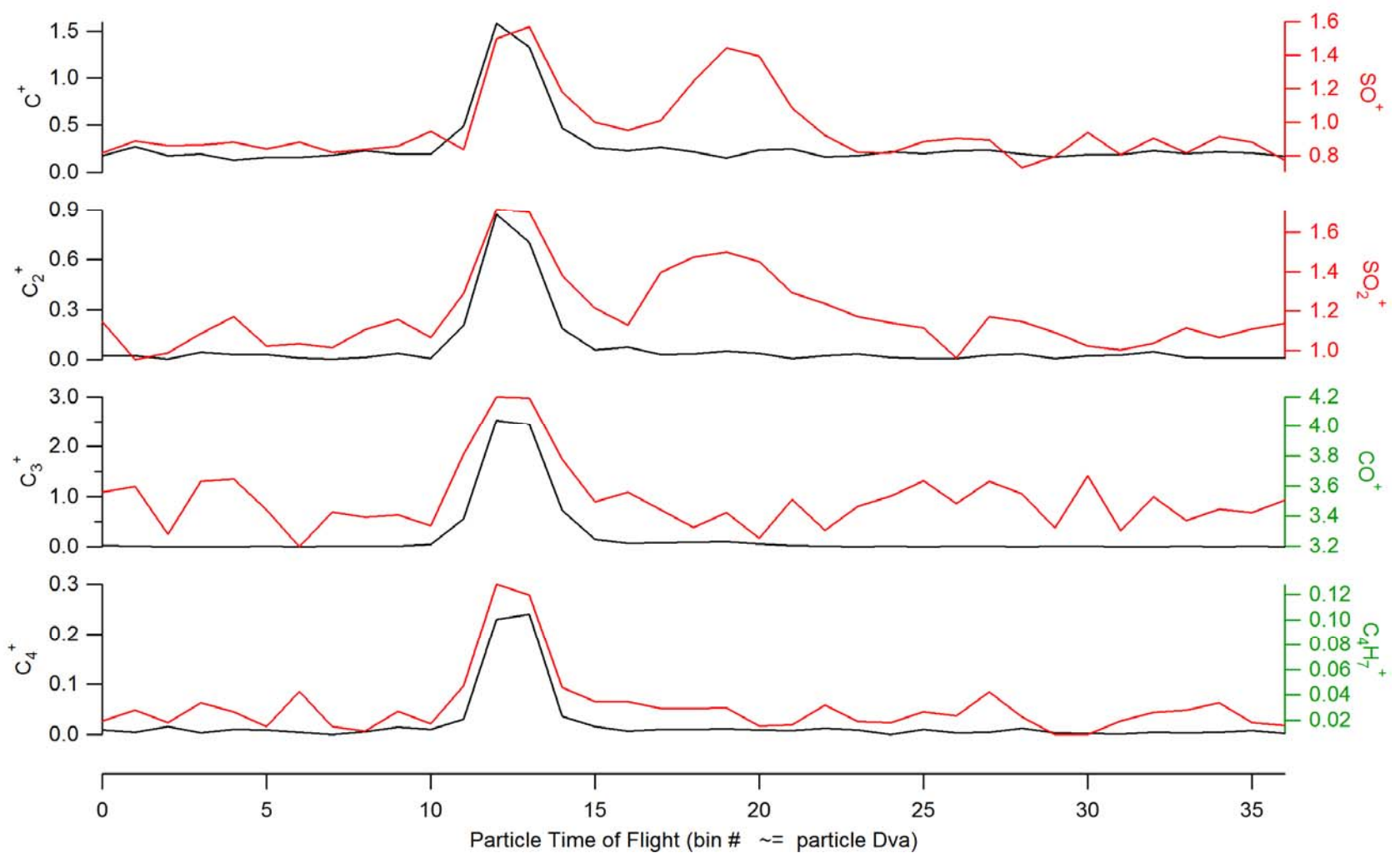
IN11 - GFG + N2



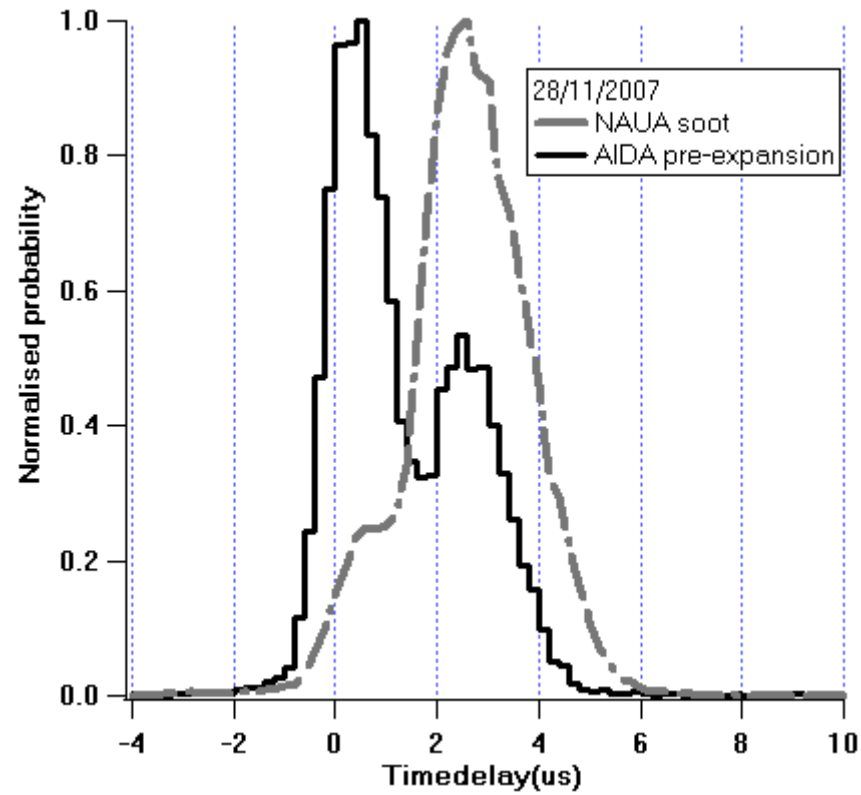
IN11 – H₂SO₄ + CAST



IN11 – H2SO4 + CAST

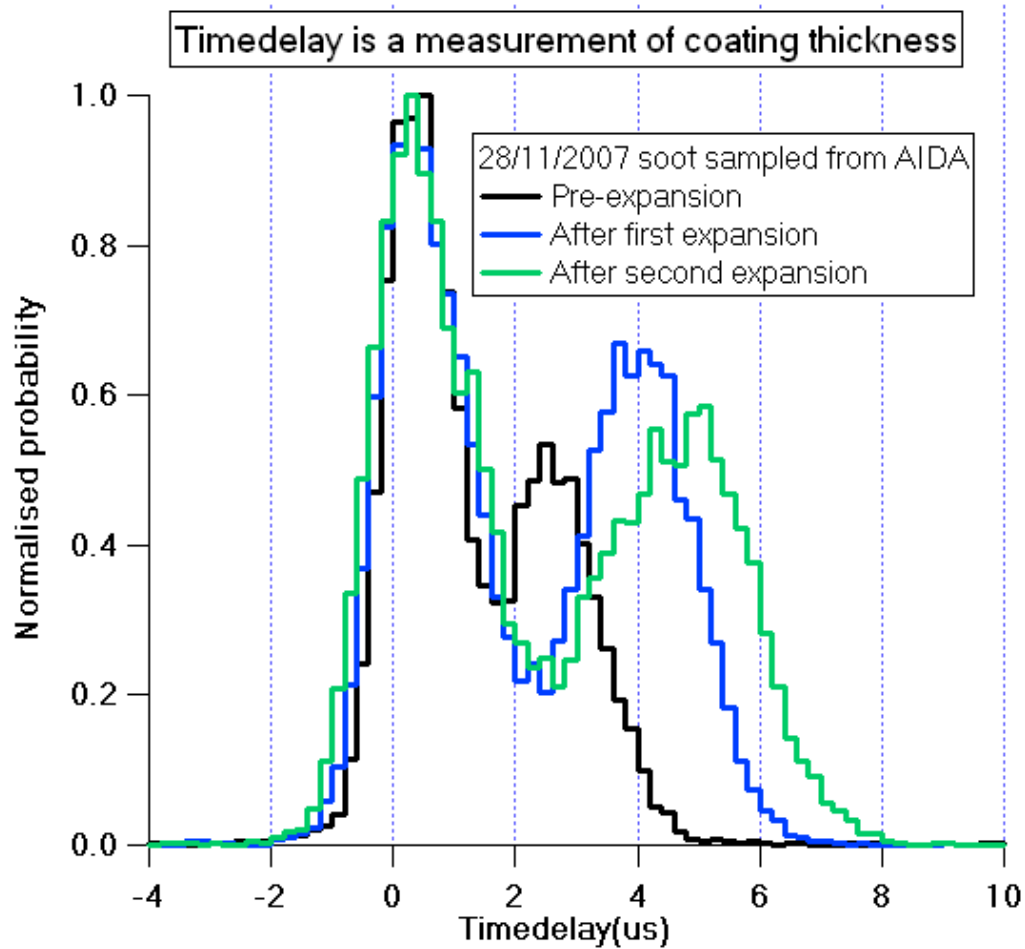


SP2 NAUA



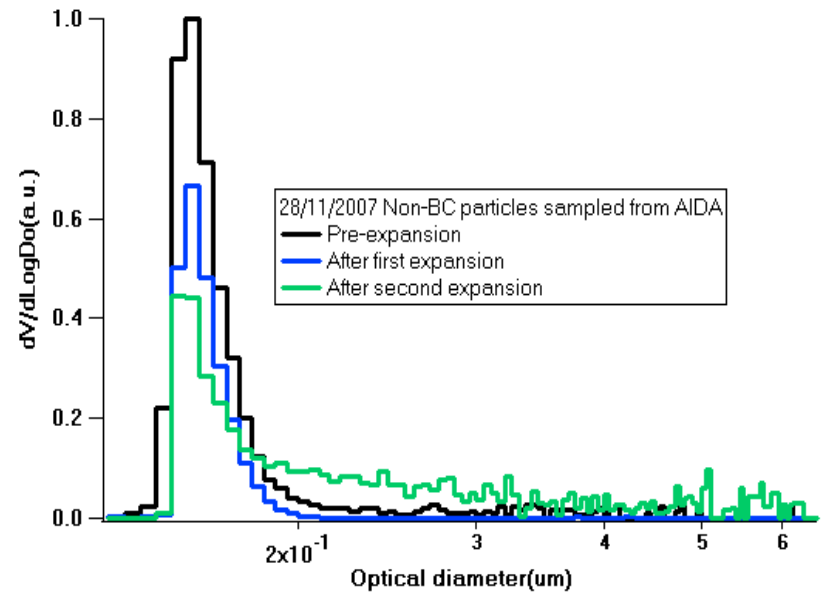
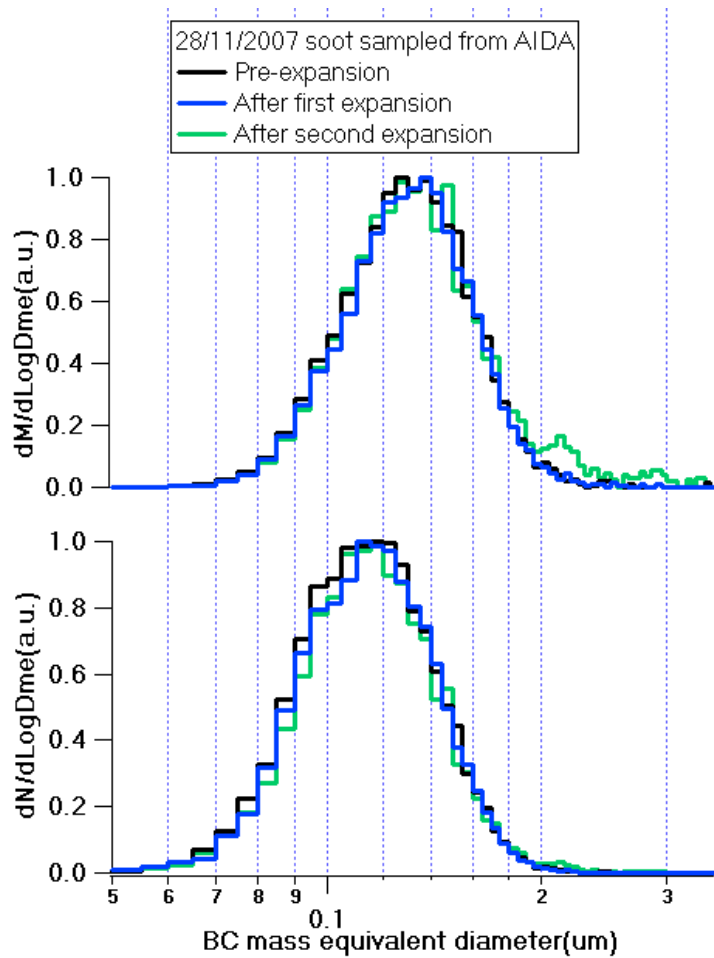
Sulphuric acid coated CAST soot

SP2



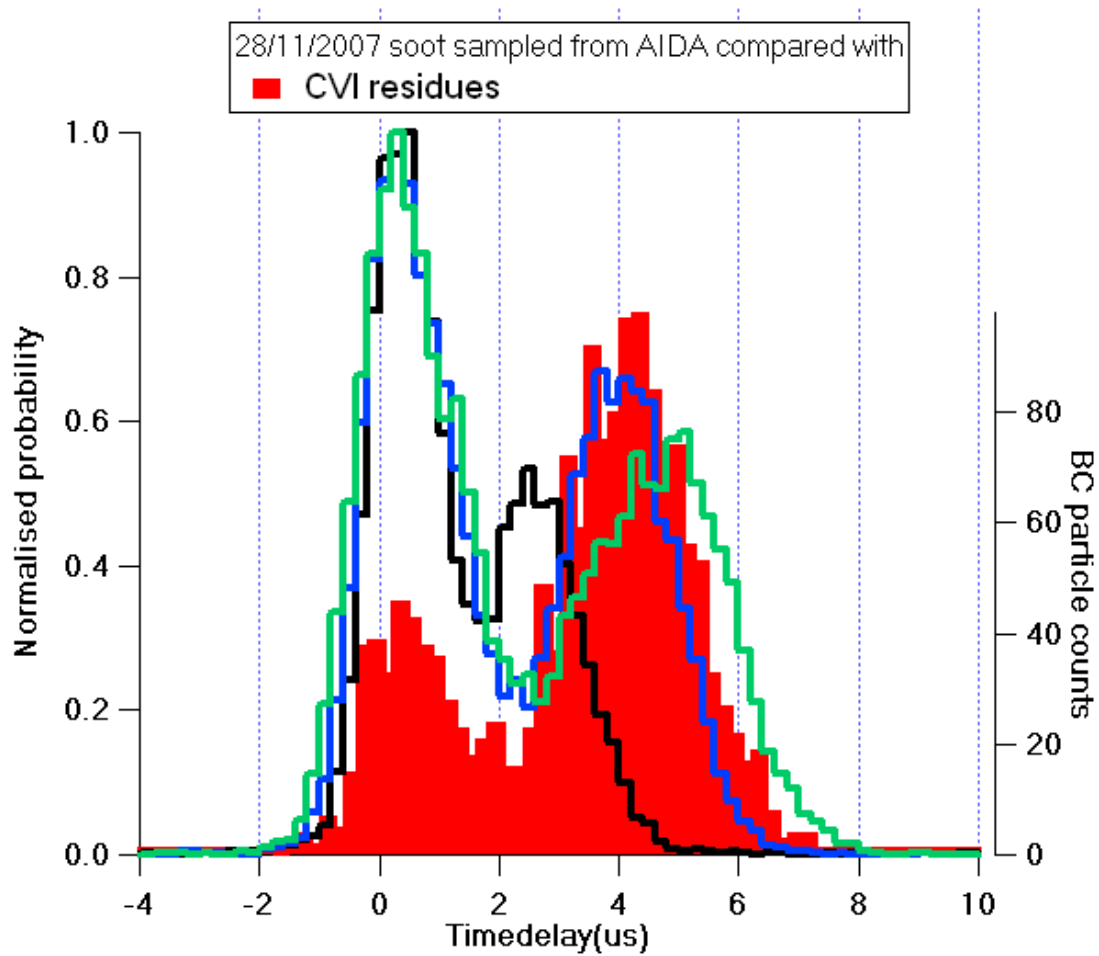
Sulphuric acid coated CAST soot

SP2



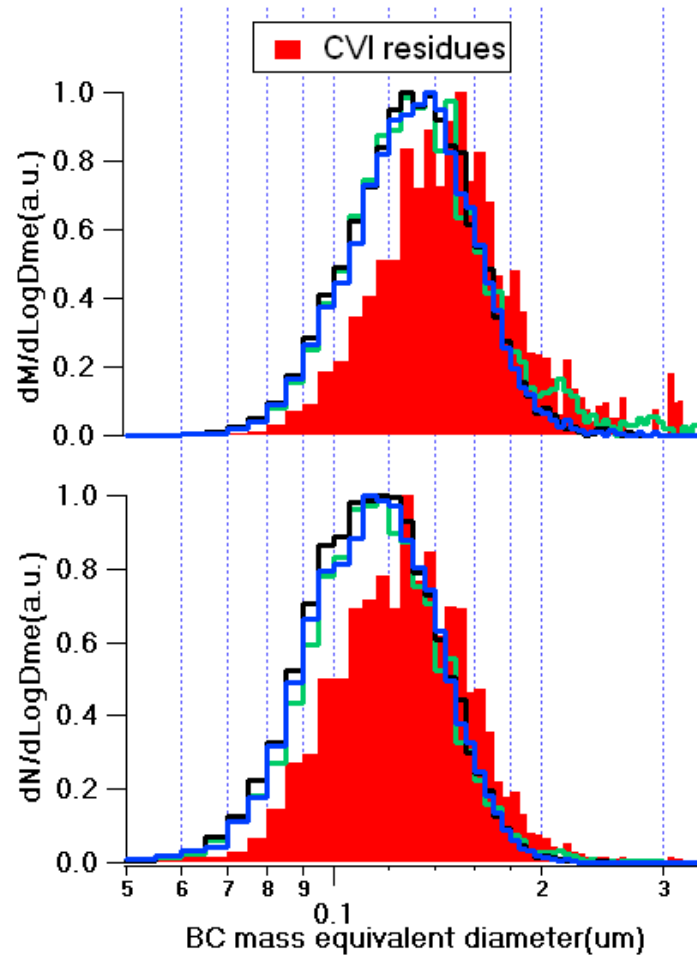
Sulphuric acid coated CAST soot

SP2



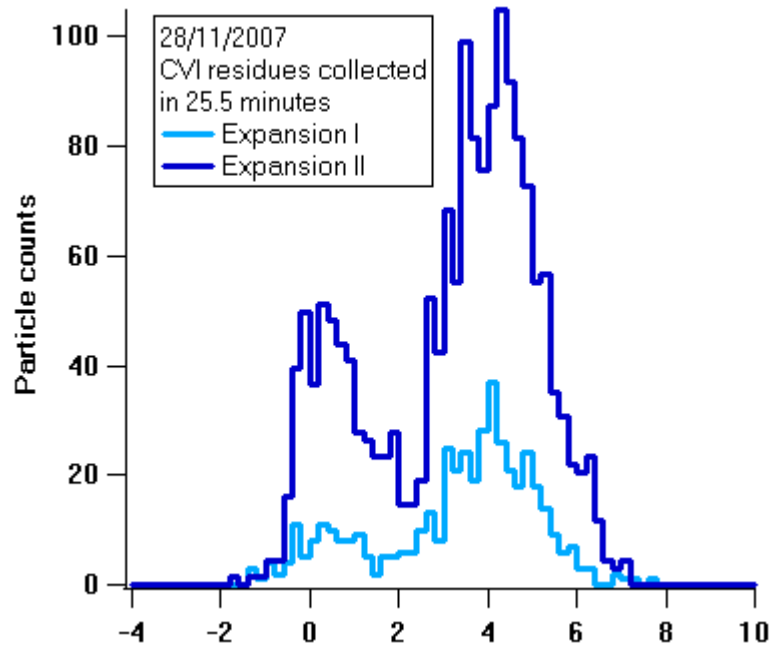
Sulphuric acid coated CAST soot

SP2



Sulphuric acid coated CAST soot

SP2



When coated by Succinic Acid or non-coated,
almost no BC was detected from CVI residues!