Initial performance of the SGP aerodynamic particle sizer

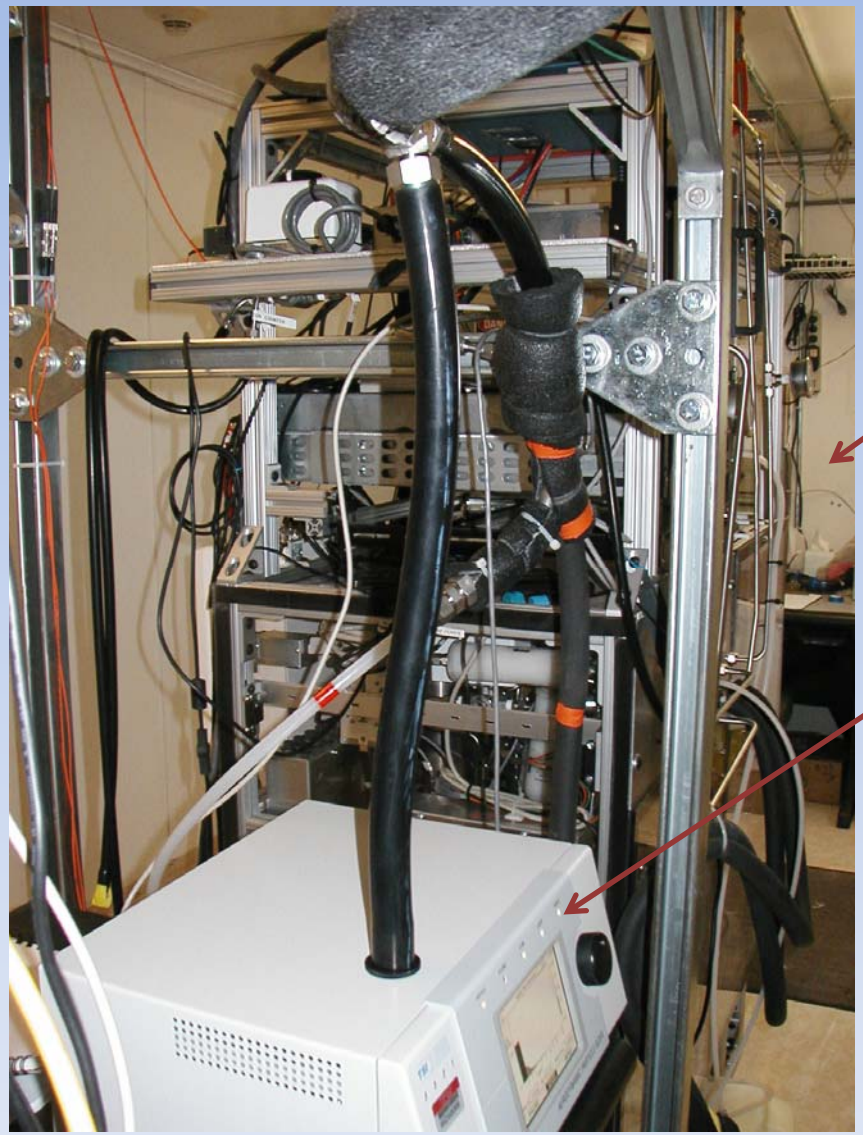
Don Collins – Texas A&M University

Background

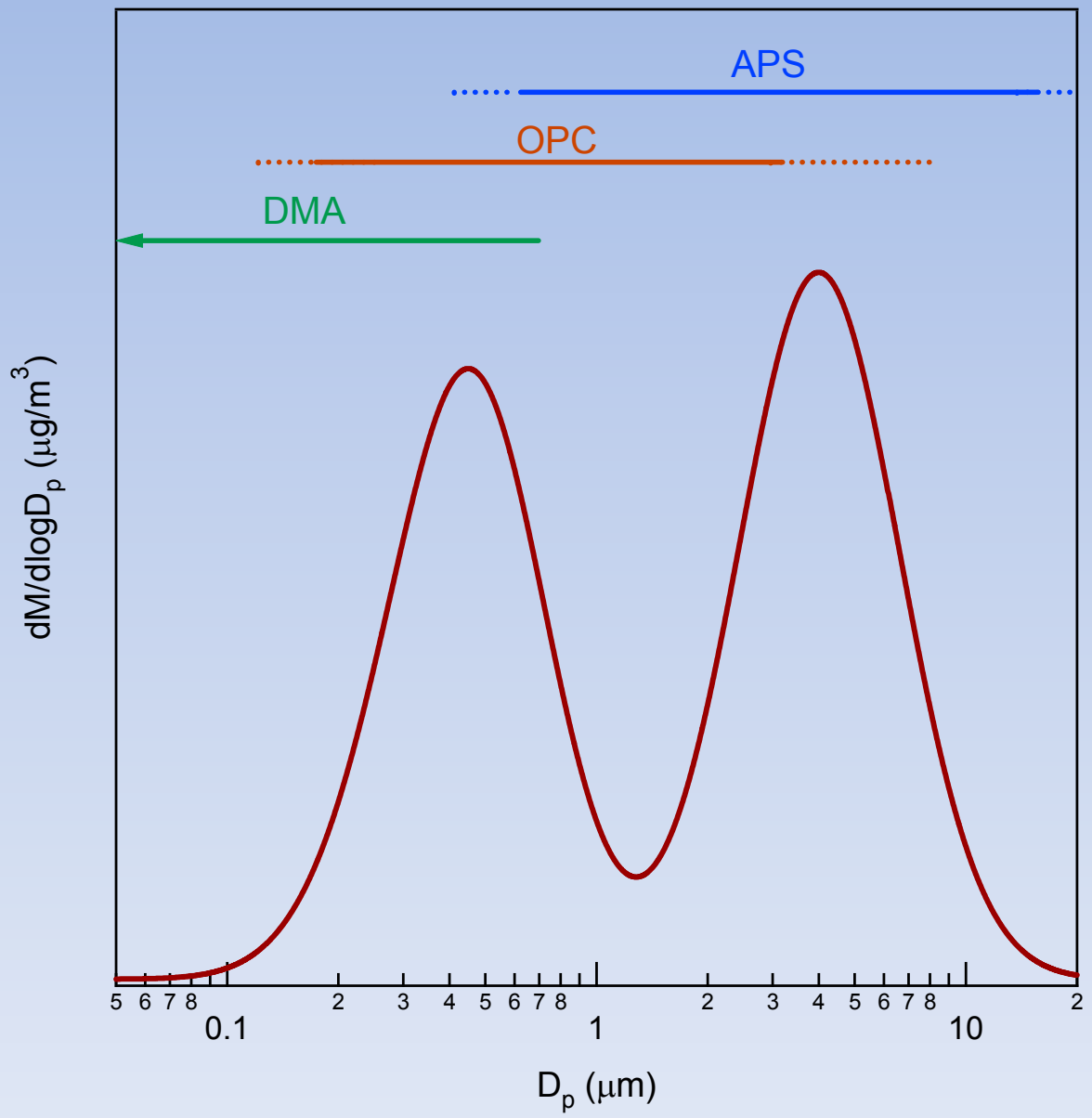
- A TSI model 3321 Aerodynamic Particle Sizer (APS) was purchased as replacement for the AOS optical particle counter that had experienced significant downtime in recent years.

- The APS was installed in July, 2008 and has been functioning properly since.

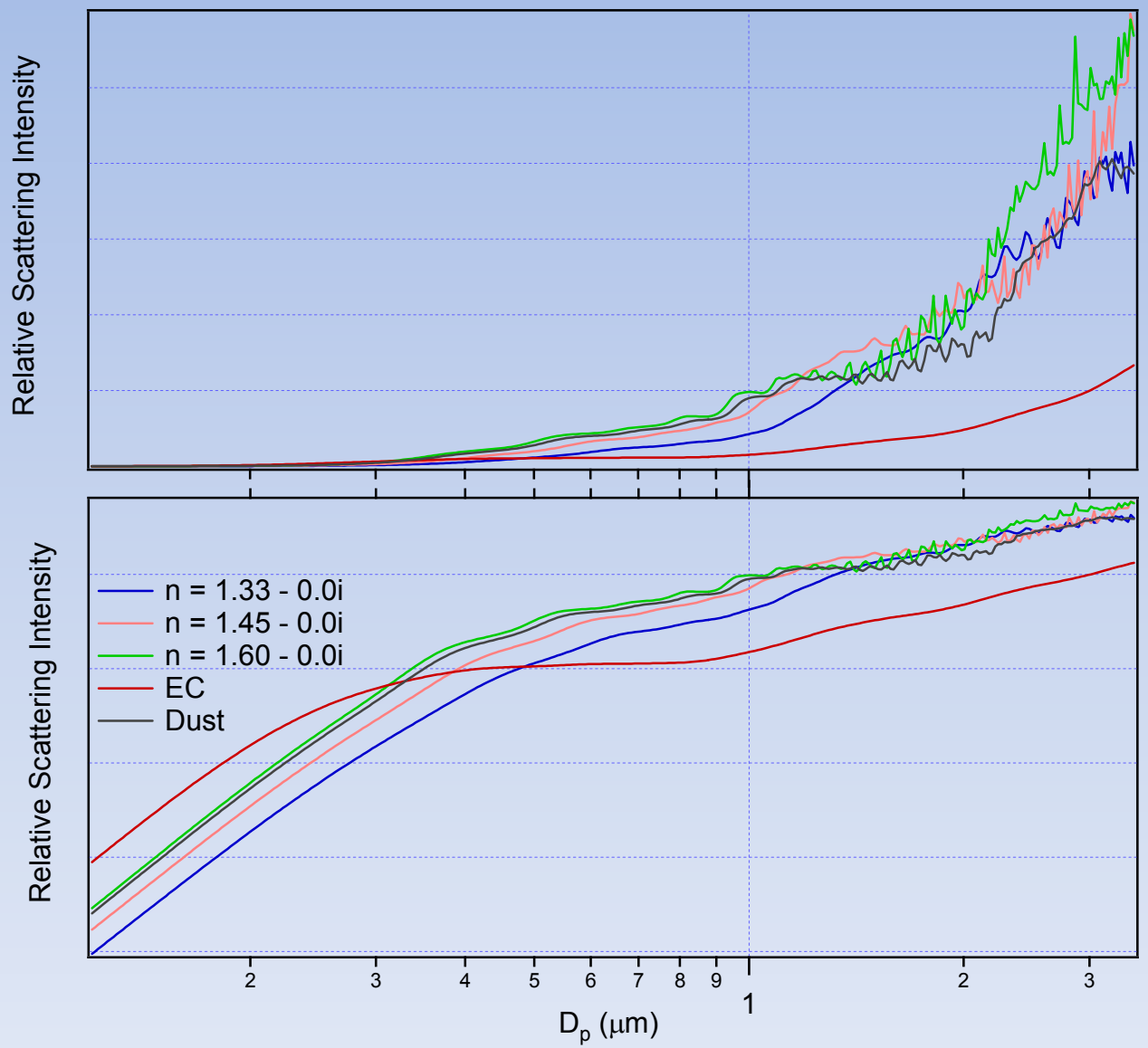
Installation



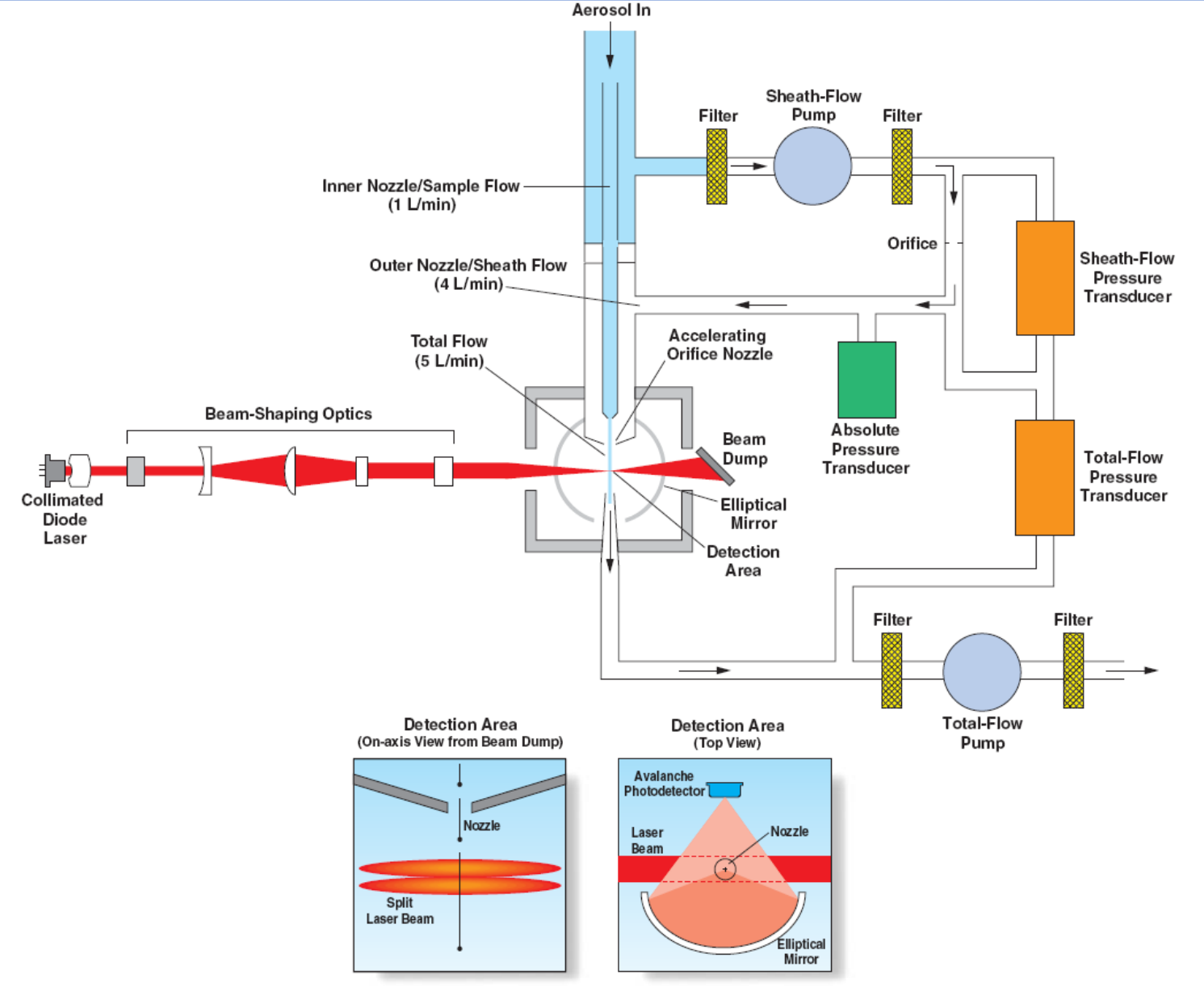
Instrument size ranges



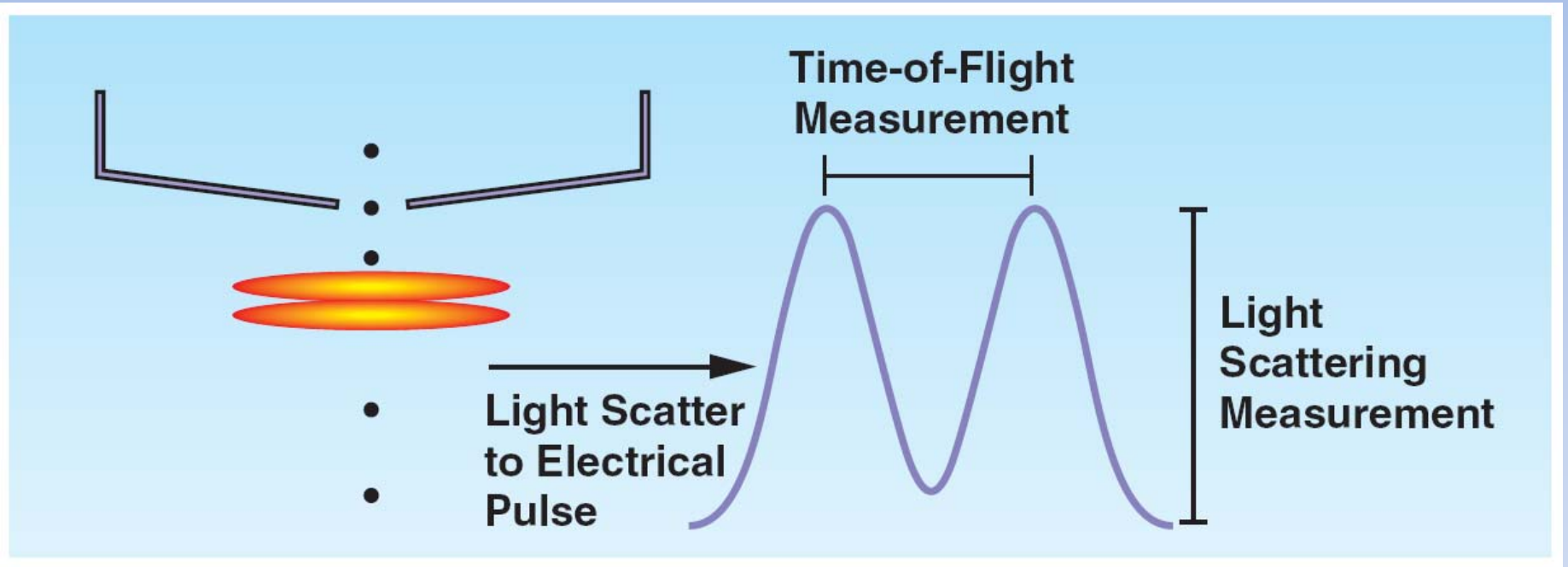
OPC sensitivity to particle composition



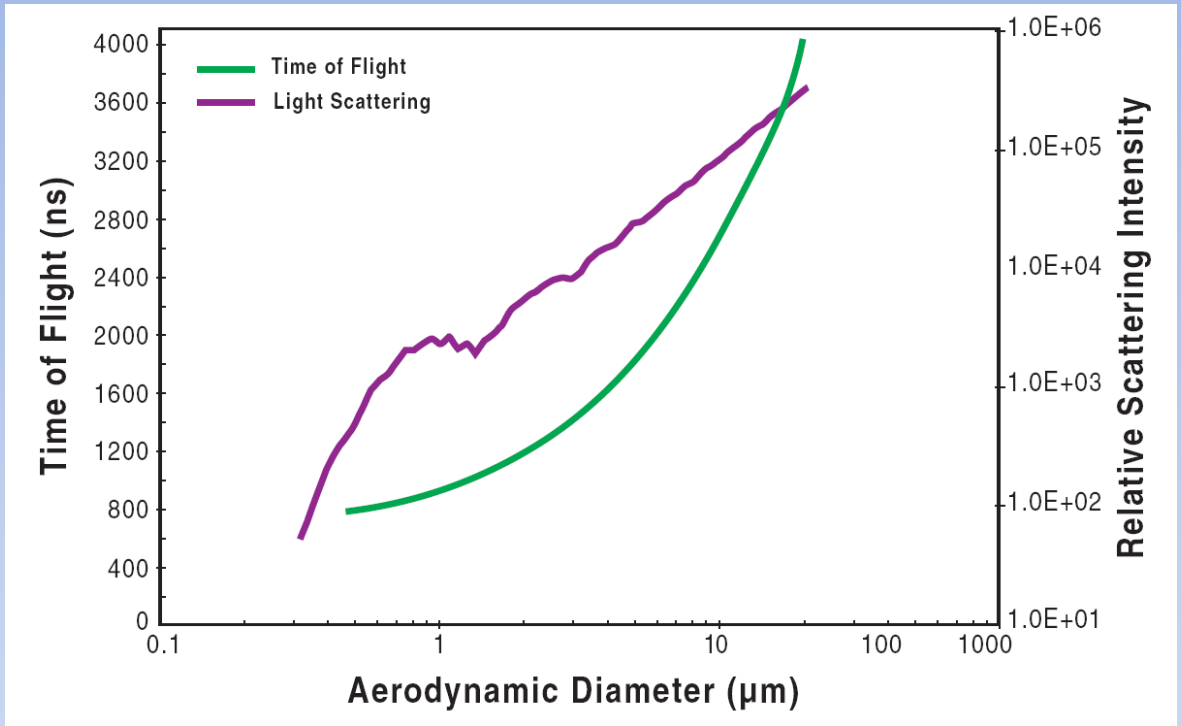
APS schematic

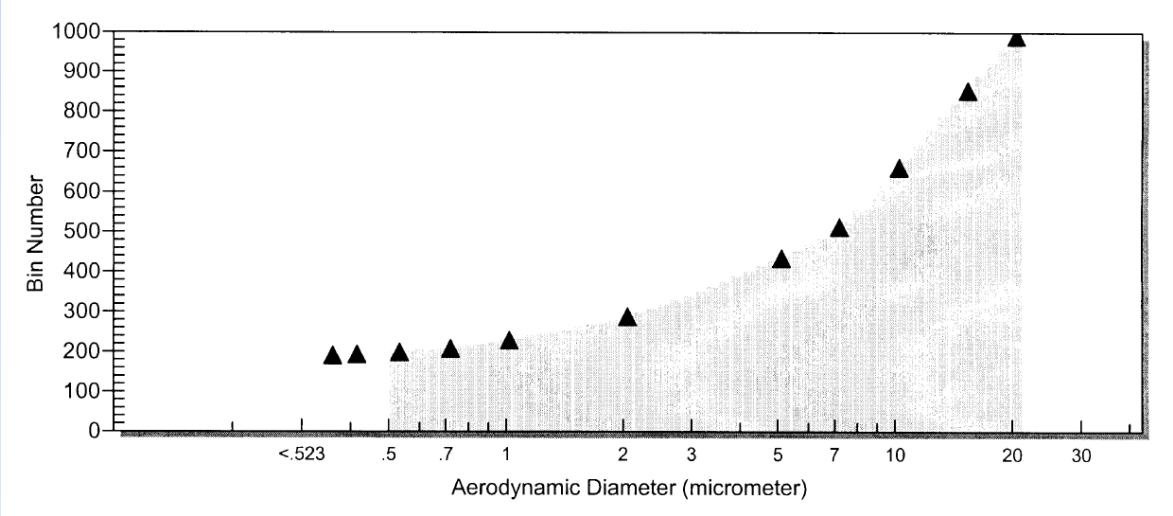


Sizing technique

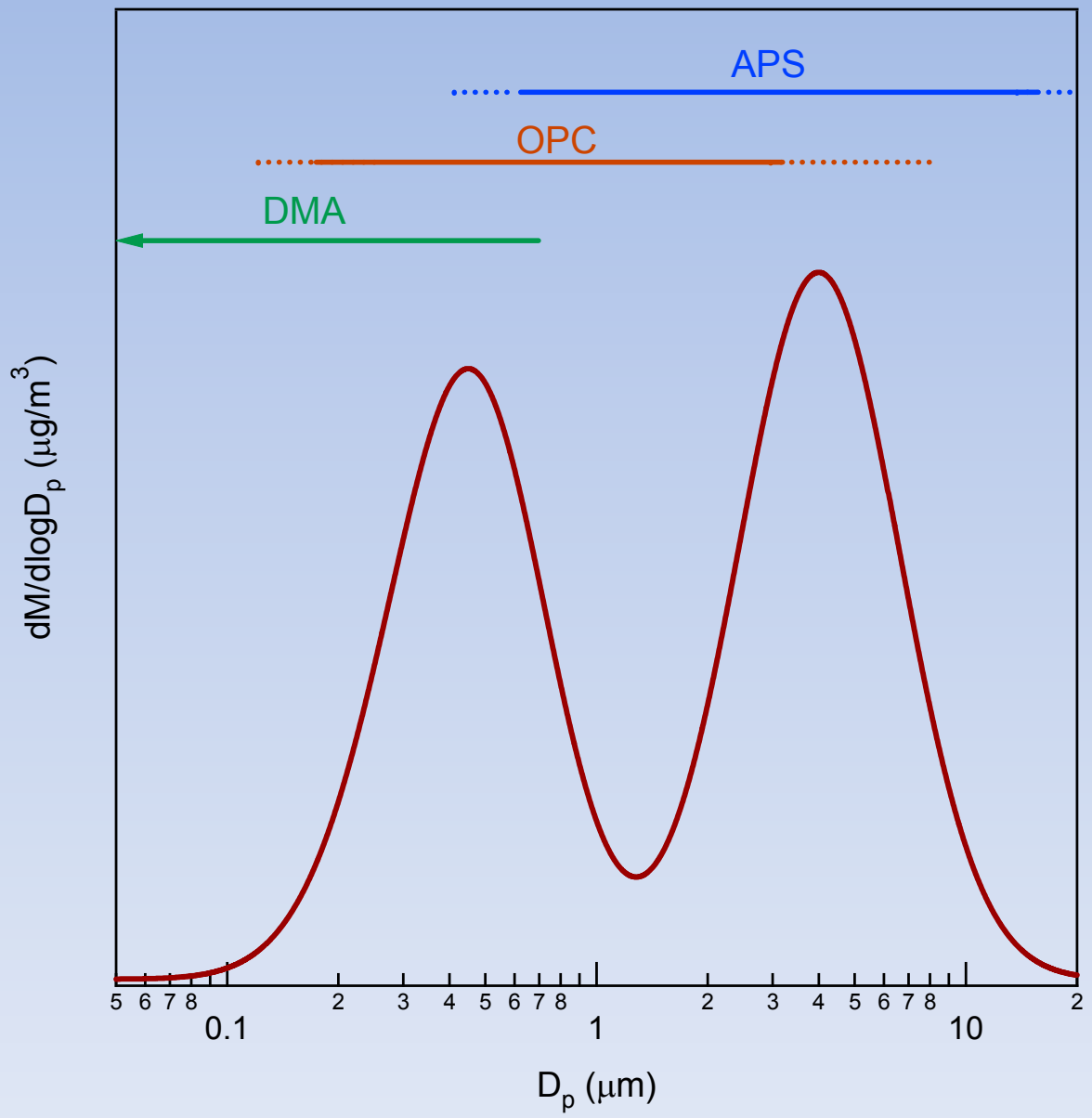


APS raw signals

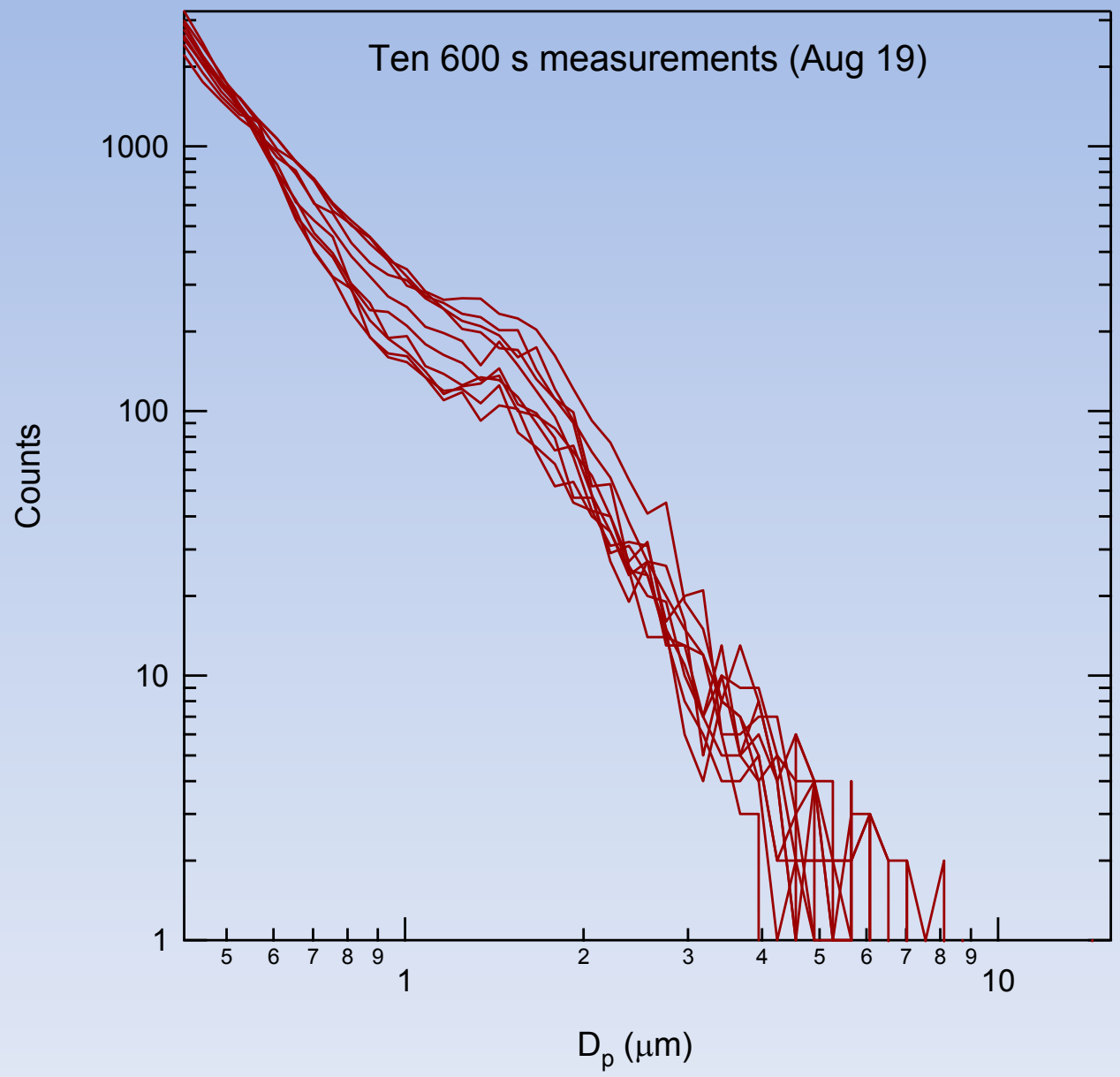




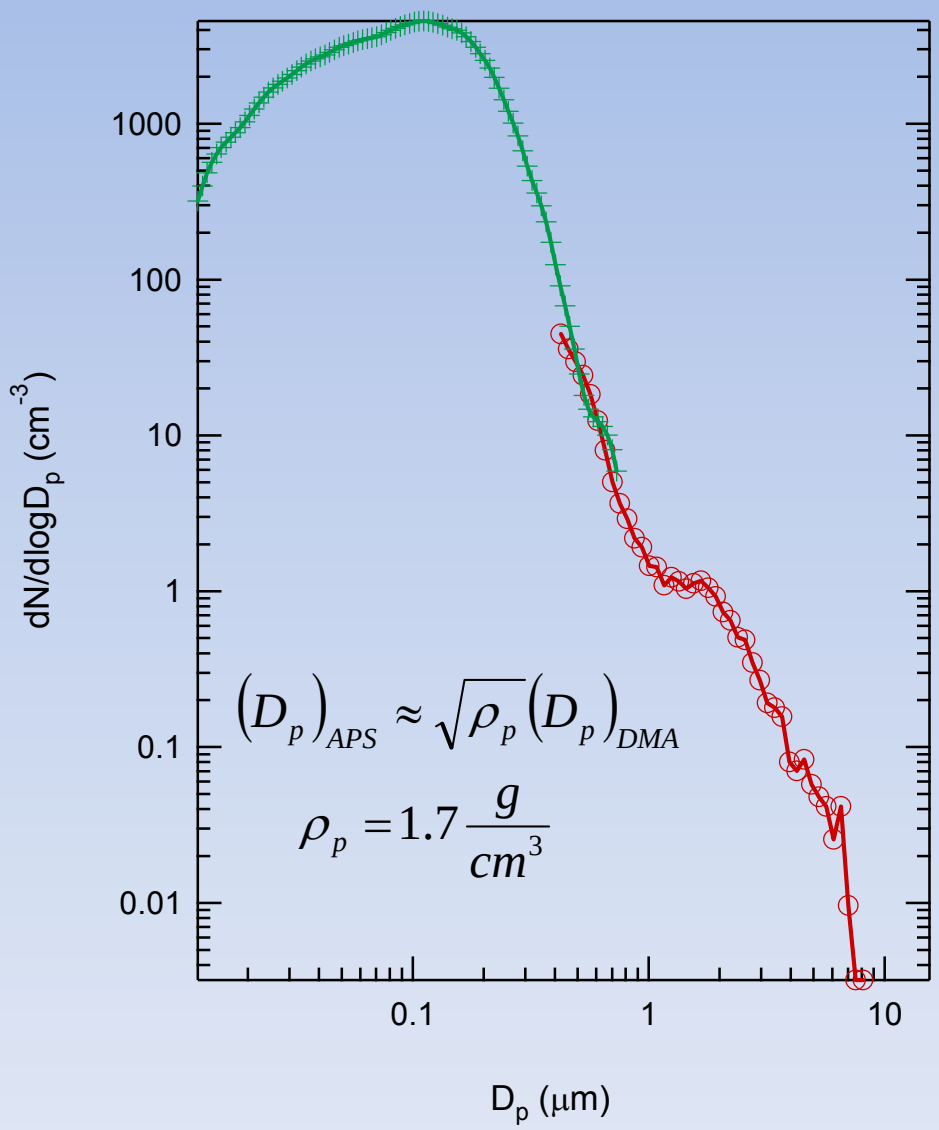
Instrument size ranges

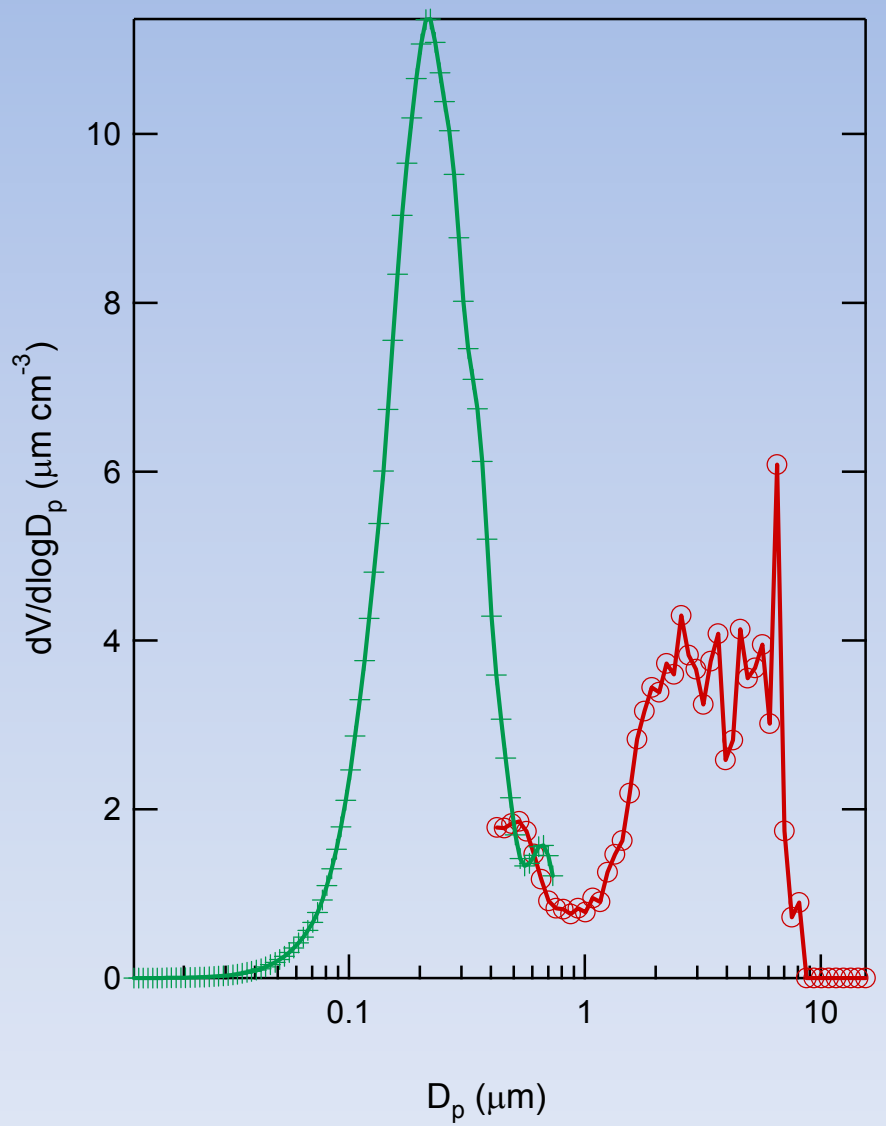


Example raw data

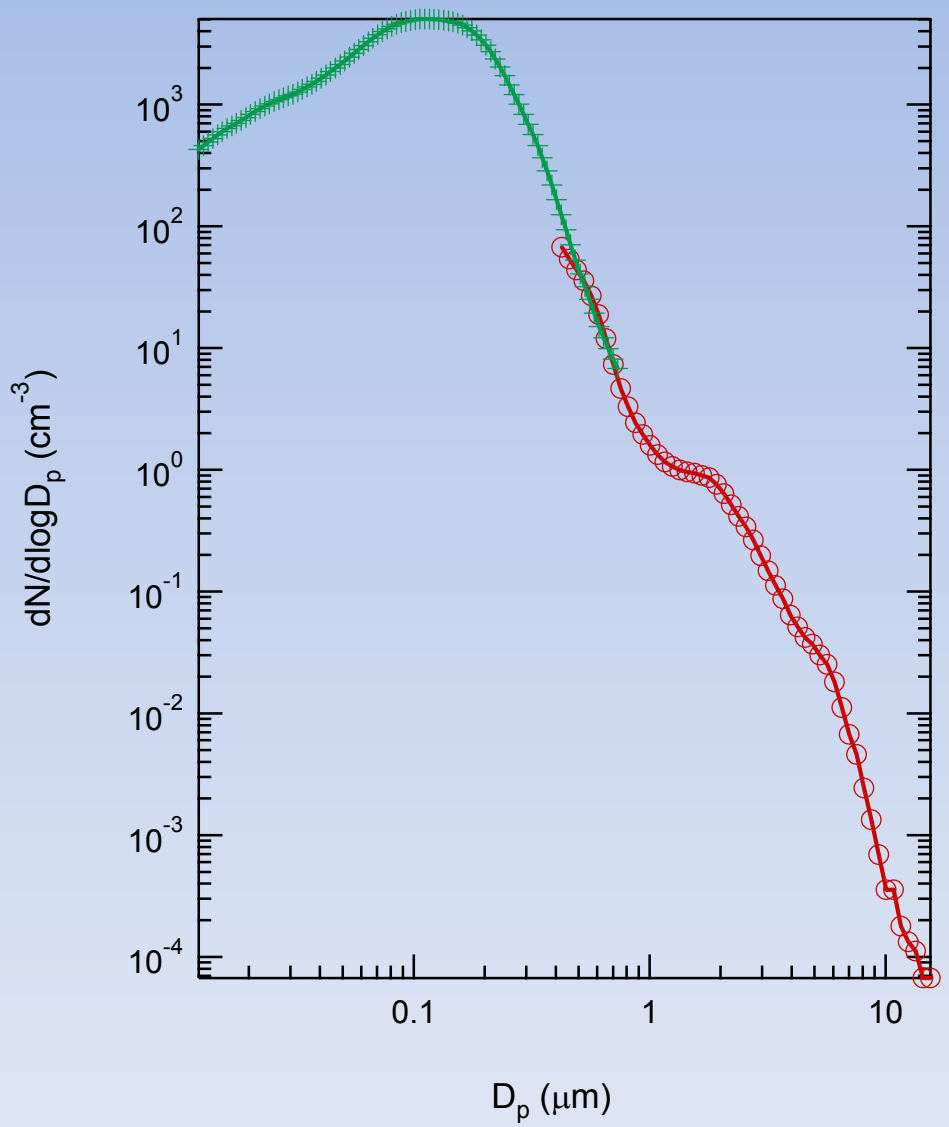


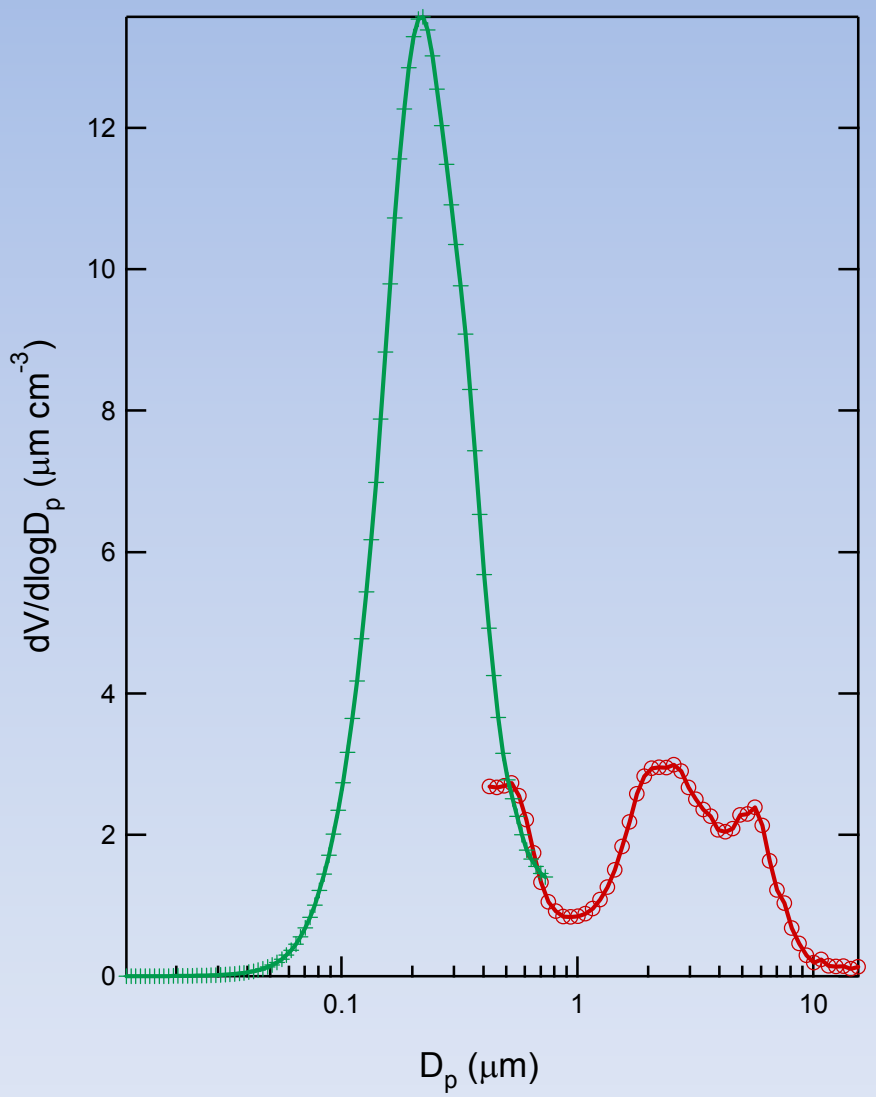
Oct 21 (single measurements)



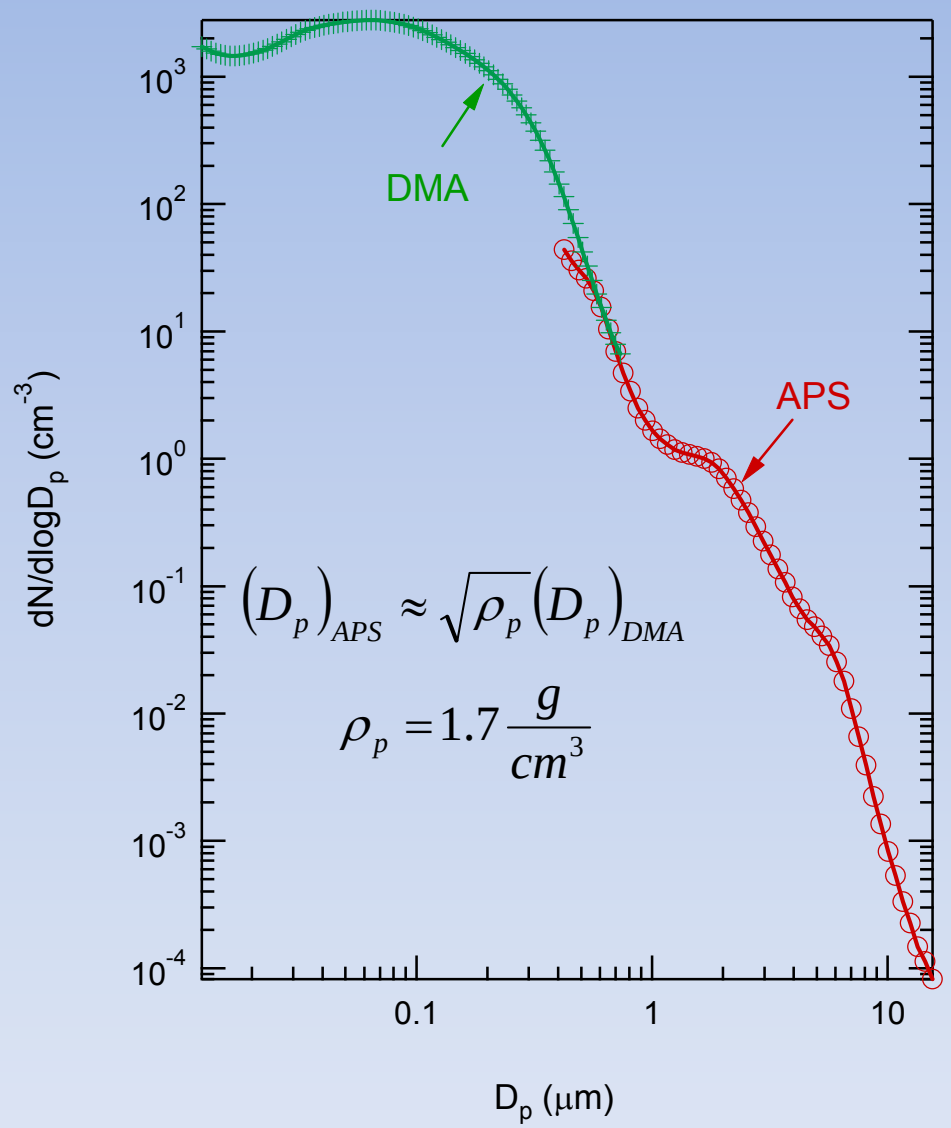


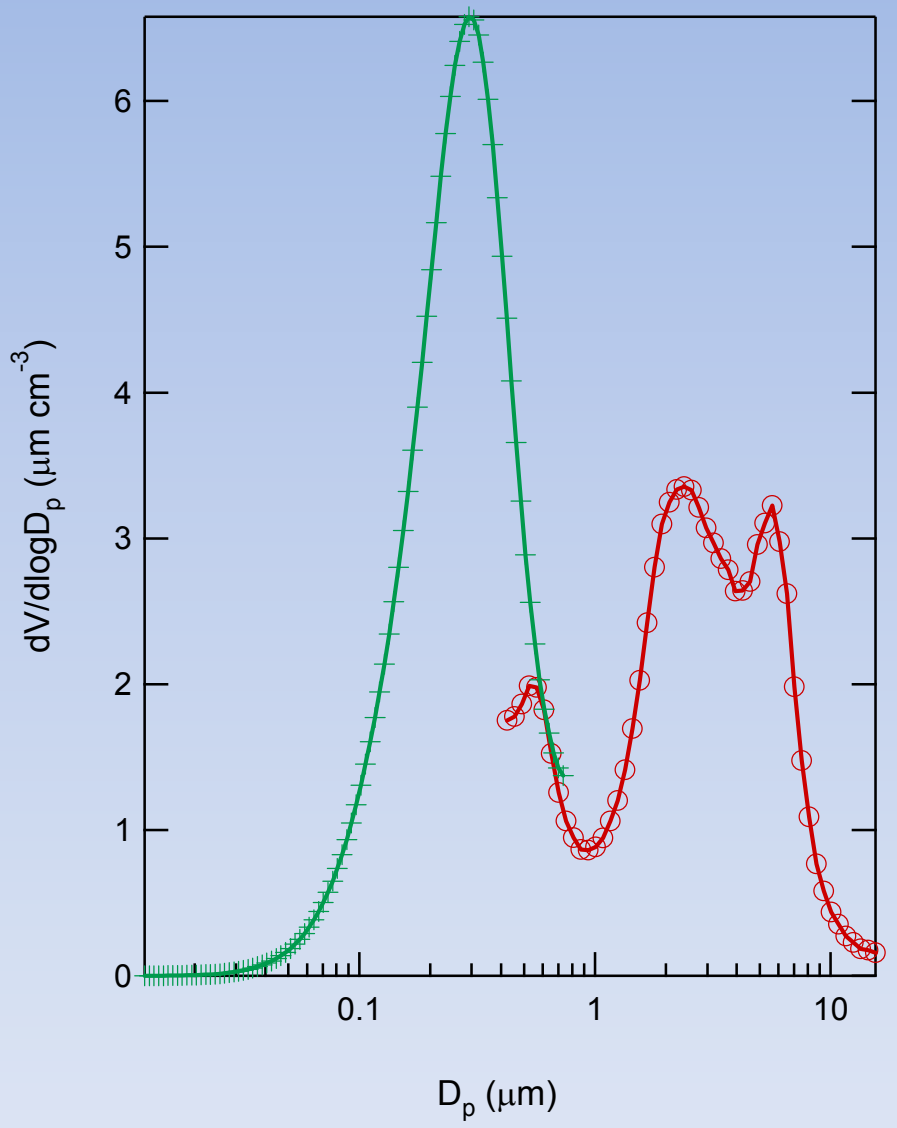
Oct 21 (24-hr avg)





3-month averages





Next steps

1. Complete more thorough evaluation of APS / DMA agreement in overlap
2. Compare 1-10 mm scattering coefficient measured with the AOS nephelometer and predicted using the APS size distribution
3. Complete software that will simultaneously invert the DMA and APS distributions

Questions / decisions

Which diameter should be reported in the data files?

Should assumed particle density be varied to improve DMA/APS agreement?

Which APS distribution(s) should be combined with the DMA distribution?

Should the sample flow be dried?

Should a computer dedicated to the APS be purchased so that APS downtime ≠ TDMA downtime