July 10, 2008

In the lab we had one TSI 3010 CPC, a TSI 3025 CPC and two PCASPs (UWYO, SN 1013-0502-29 and NCAR, SN 23738-0491-08).

For particle sizing we had a classifying SMPS, a scanning SMPS and the UWYO and NCAR PCASPs.

There was on type of test aerosol:
1) atomized/classified polystyrene latex

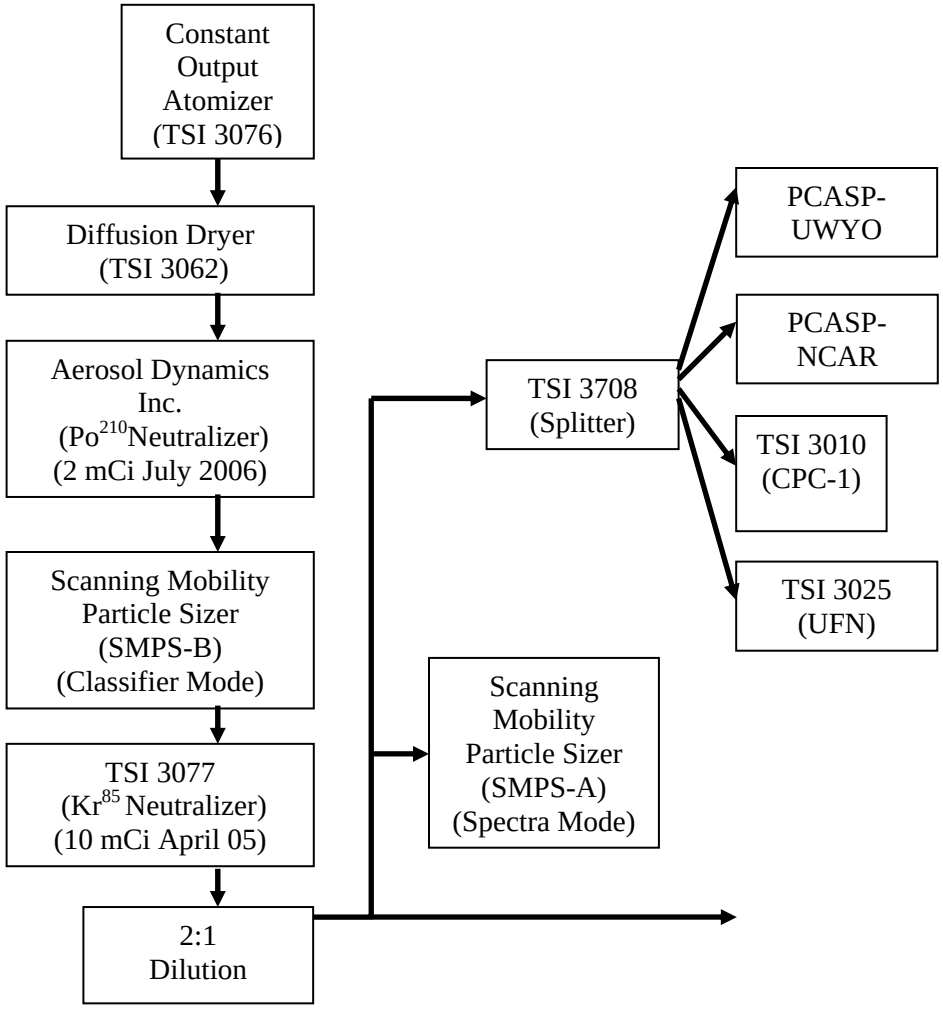
Our most recent results are shown on the following pages. Prior tests, with the UWYO PCASP, are summarized here:

http://www-das.uwyo.edu/~jsnider/nasa06/pcasp_report_7.pdf

Comment: The NCAR PCASP was returned to DMT after these tests.

July 10, 2008

Here is a sketch of the lab setup



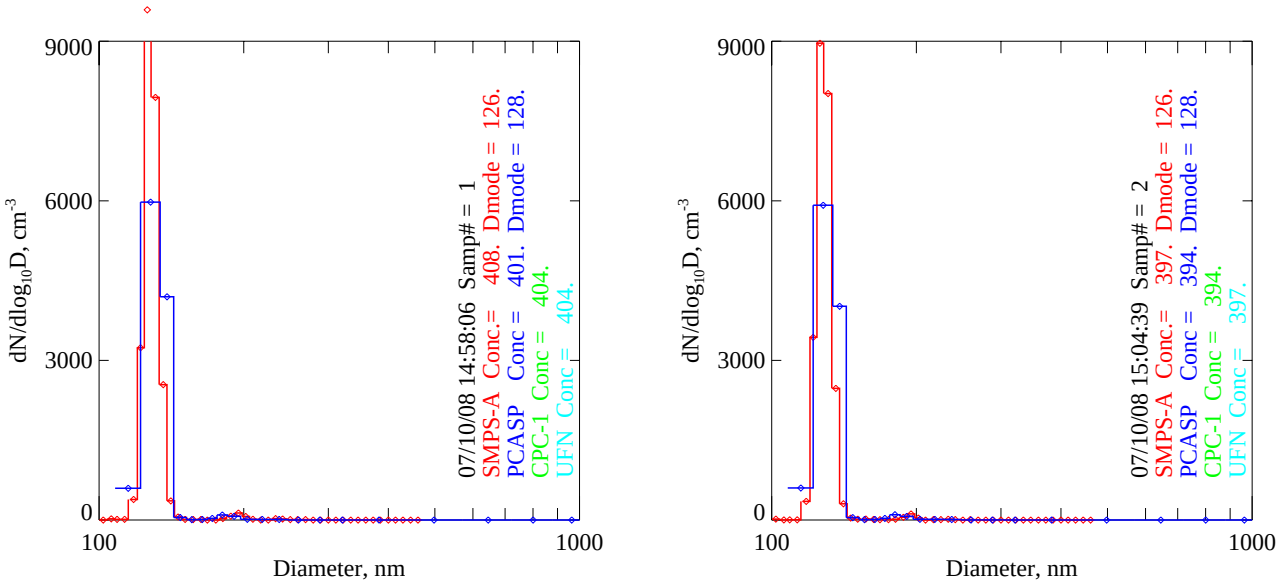


Figure 6UWYO – Here the test aerosol is 125 nm diameter atomized/classified polystyrene latex.

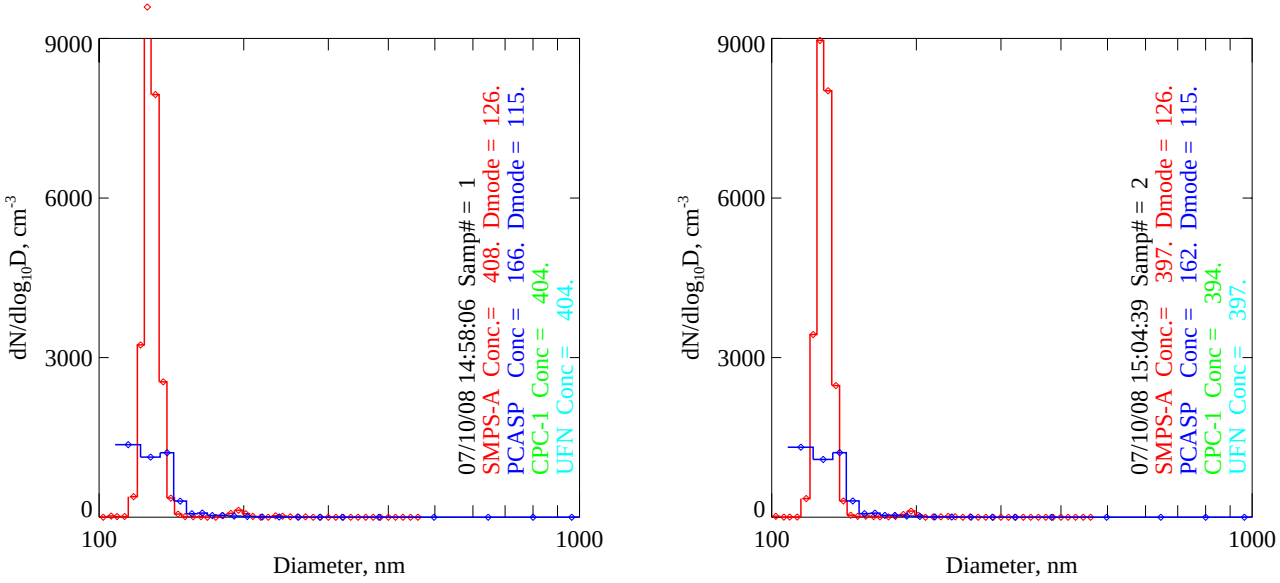
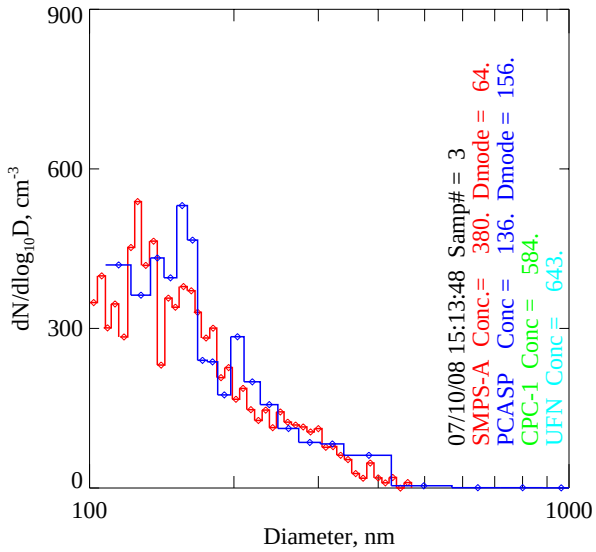


Figure 6NCAR – Here the test aerosol is 125 nm diameter atomized/classified polystyrene latex. PCASP sizing is estimated using results obtain by Peter Liu for the UWYO PCASP.



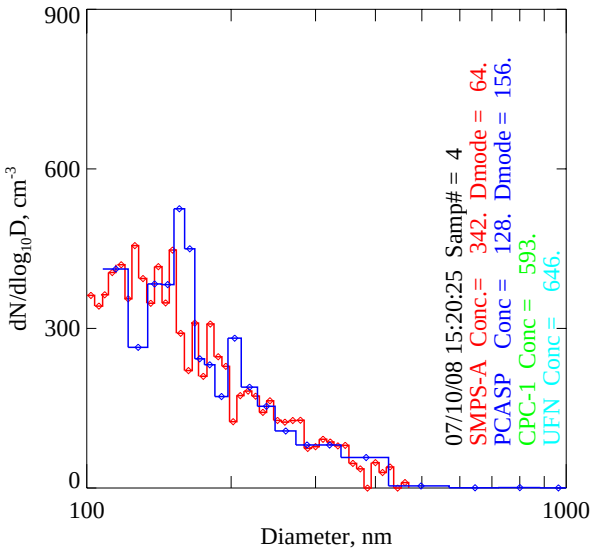
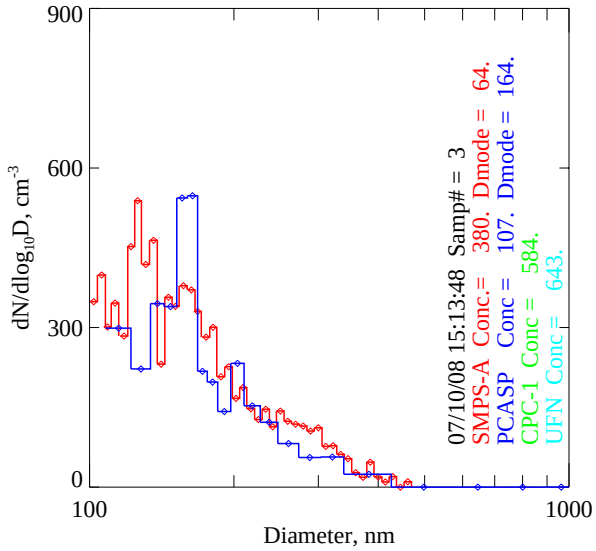


Figure 7UWYO – Ambient aerosol.



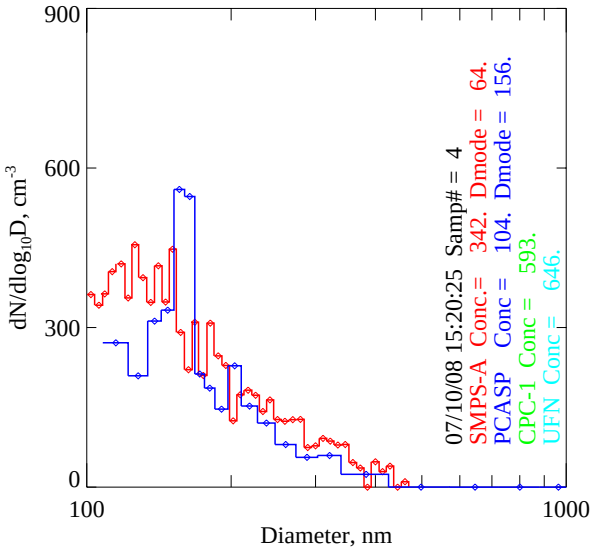
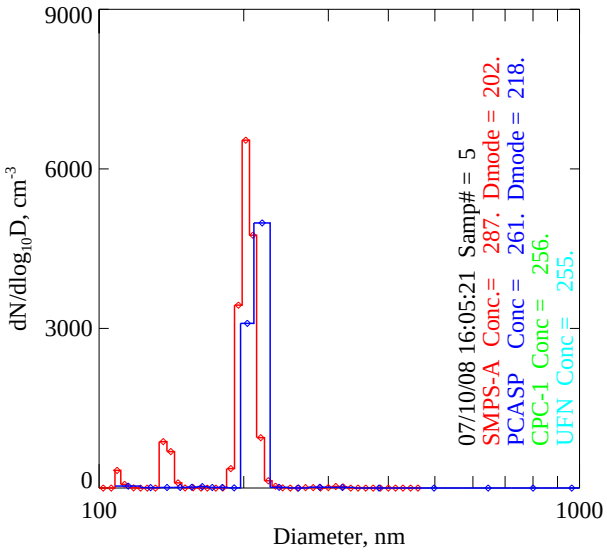


Figure 7NCAR – Ambient aerosol. PCASP sizing is estimated using results obtain by Peter Liu for the UWYO PCASP.



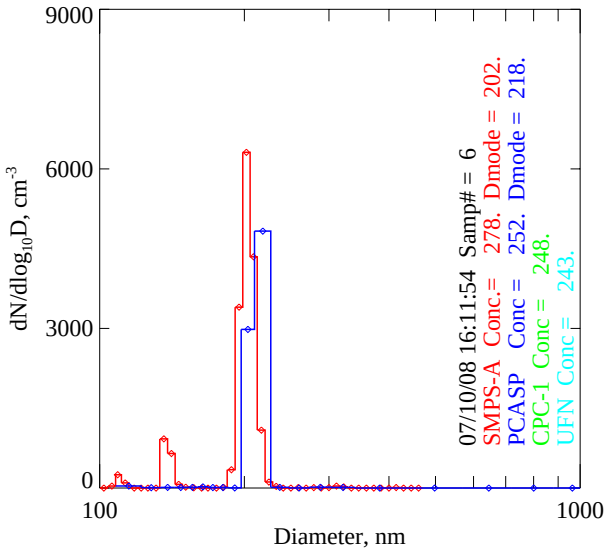
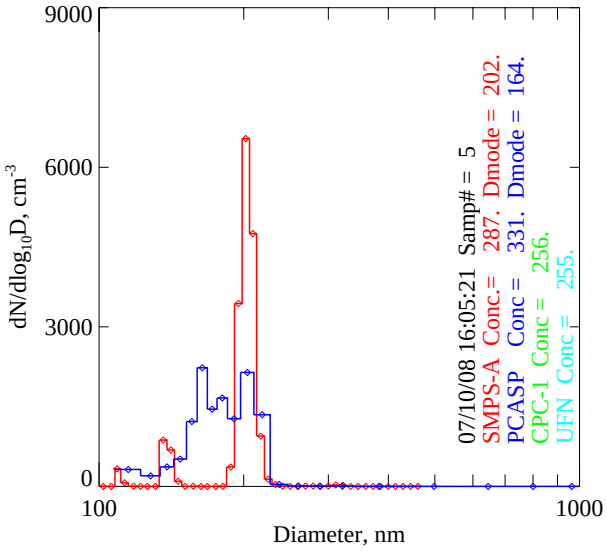


Figure 8UWYO - Here the test aerosol is 199 nm diameter atomized/classified polystyrene latex.



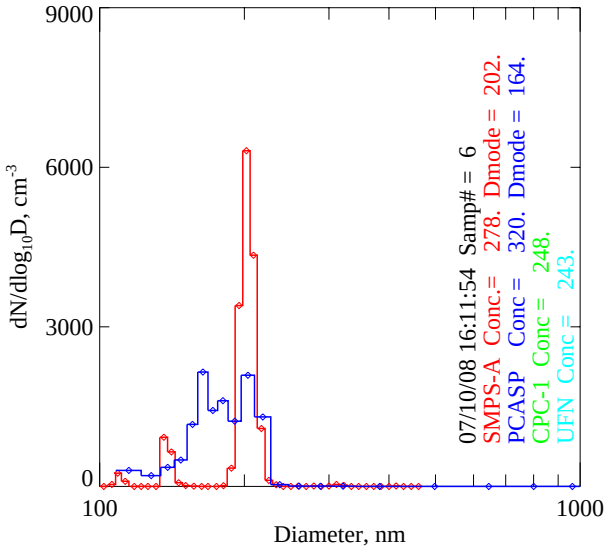


Figure 8NCAR - Here the test aerosol is 199 nm diameter atomized/classified polystyrene latex. PCASP sizing is estimated using results obtain by Peter Liu for the UWYO PCASP.

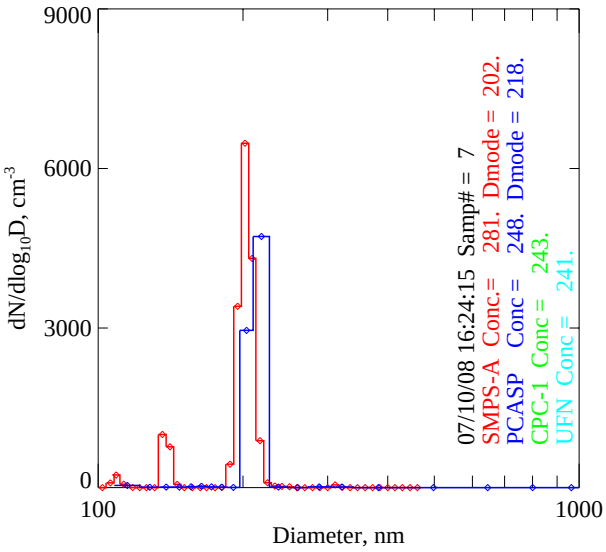


Figure 9UWYO - Here the test aerosol is 199 nm diameter atomized/classified polystyrene latex.

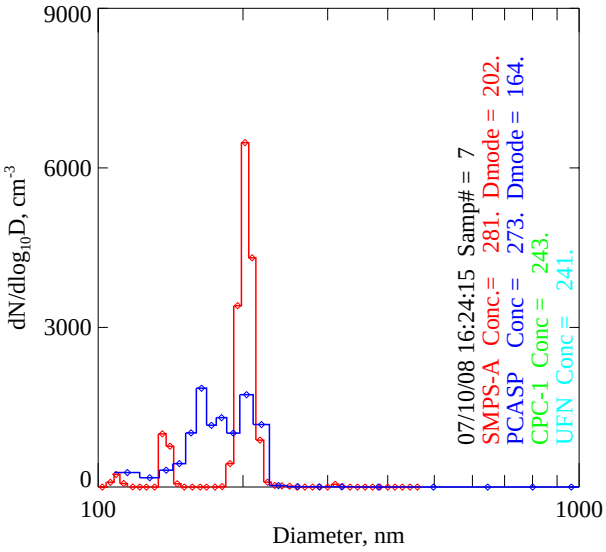


Figure 9NCAR - Here the test aerosol is 199 nm diameter atomized/classified polystyrene latex. PCASP sizing is estimated using results obtain by Peter Liu for the UWYO PCASP.

August 18, 2008

In the lab we had one TSI 3010 CPC, a TSI 3025 CPC and two PCASPs (UWYO, SN 1013-0502-29 and NCAR, SN 23738-0491-08)

For particle sizing we had a classifying SMPS, a scanning SMPS and the UWYO and NCAR PCASPs.

There was on type of test aerosol:
1) atomized/classified polystyrene latex

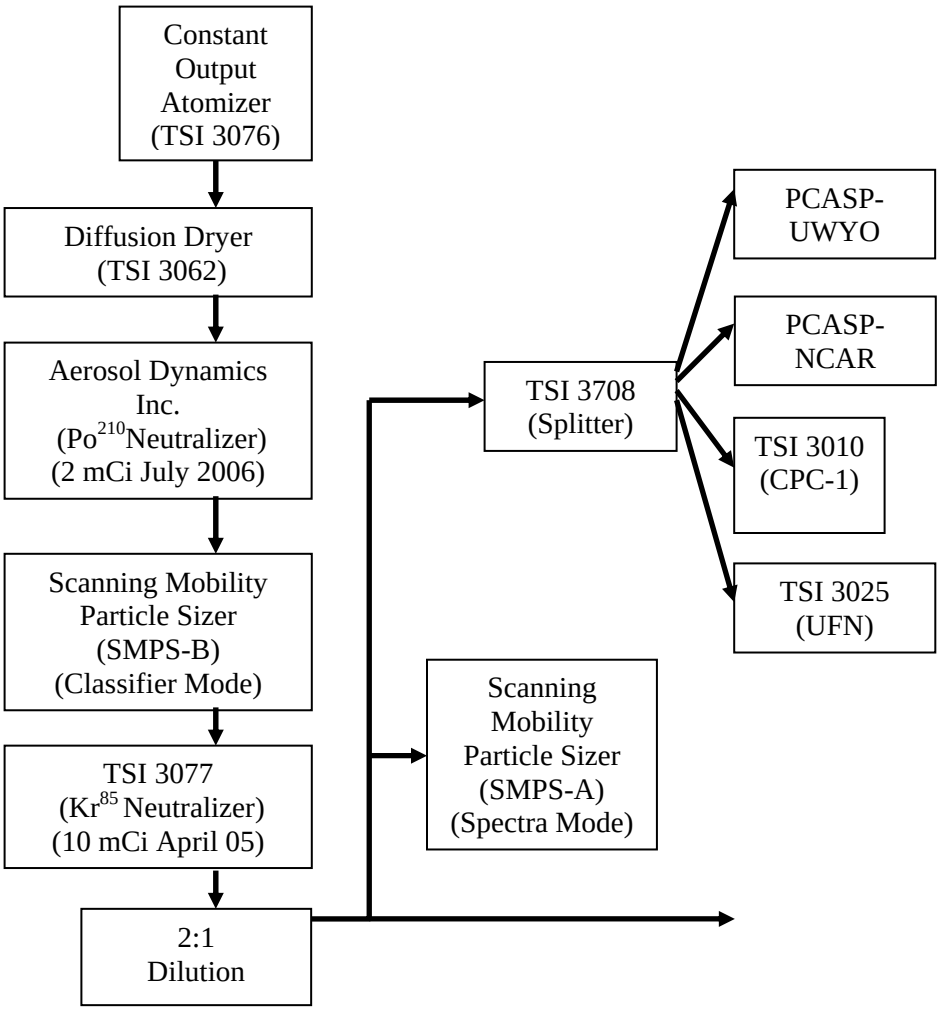
Our most recent results are shown on the following pages. Prior tests, with the UWYO PCASP, are summarized here:

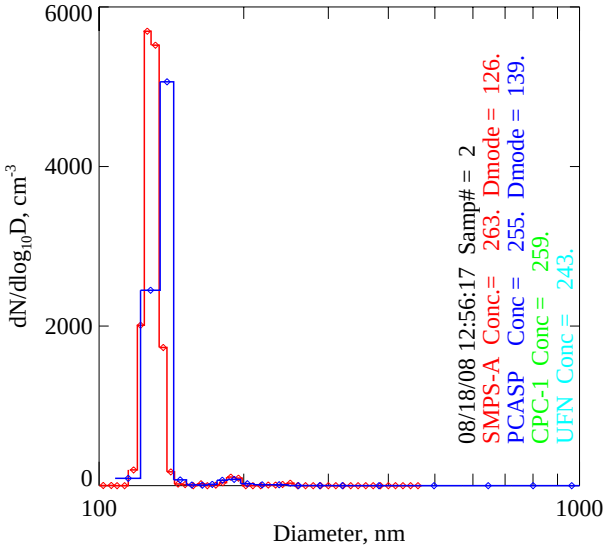
http://www-das.uwyo.edu/~jsnider/nasa06/pcasp_report_7.pdf

Comment: The NCAR PCASP was calibrated at DMT on August 12, 2008

August 18, 2008

Here is a sketch of the lab setup





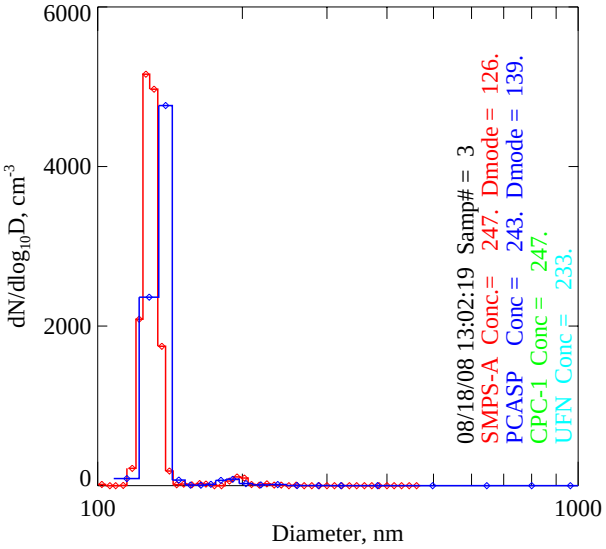
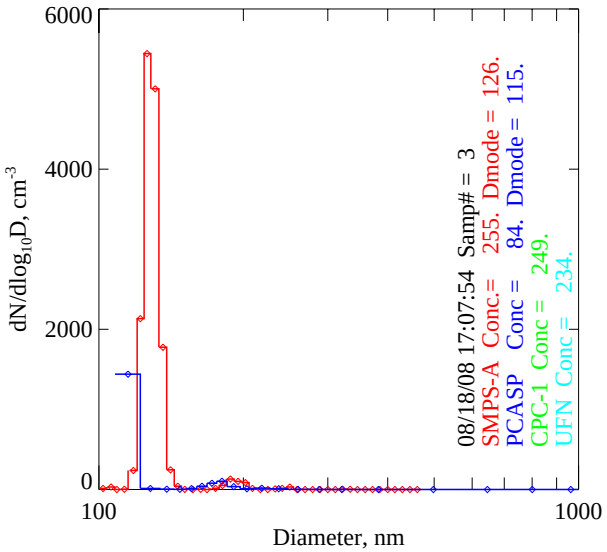


Figure 10UWYO – Here the test aerosol is 125 nm diameter atomized/classified polystyrene latex. Counting agreement (with CPC-1) is good. The sizing agreement (with SMPS) is acceptable, but the UWYO PCASP is registering one channel larger than seen in all previous experiments with this test aerosol. For prior comparisons see earlier in this document and also online at http://www-das.uwyo.edu/~jsnider/nasa06/pcasp_report_7.pdf



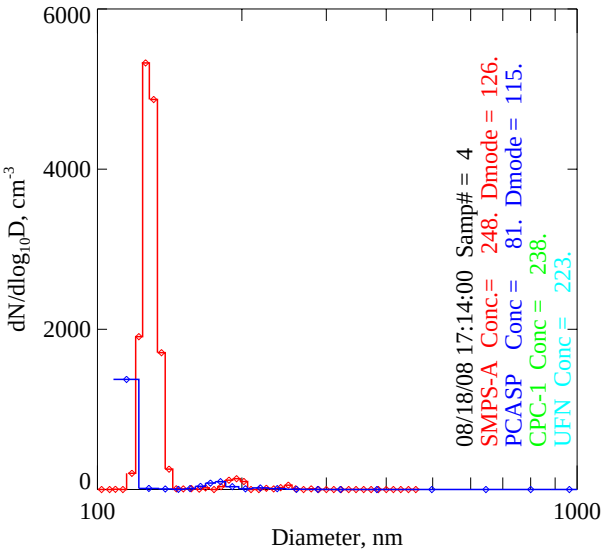


Figure 11NCAR – Here the test aerosol is 125 nm diameter atomized/classified polystyrene latex. The NCAR PCASP is sizing smaller than the SMPS, and it appears (based on the concentration values), that over half of the particles passing through the PCASP are not triggering the probe. PCASP sizing is estimated using results obtain by Peter Liu for the UWYO PCASP.

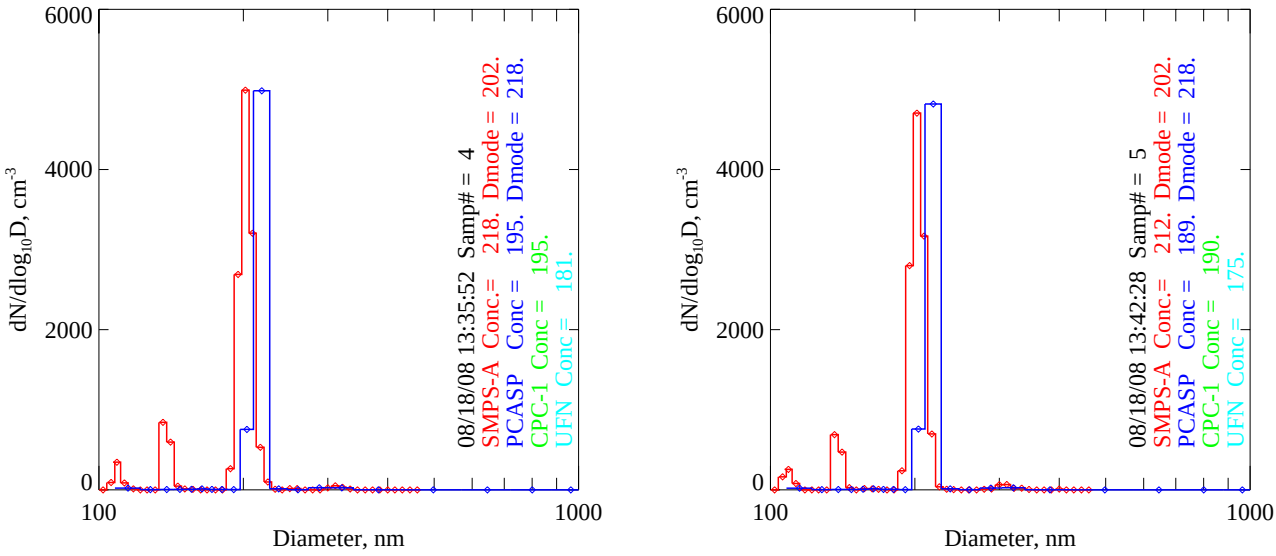


Figure 12UWYO – Here the test aerosol is 199 nm diameter atomized/classified polystyrene latex. Counting agreement (with CPC-1) is good. The sizing, compared to SMPS, is showing the same shift as in prior comparisons at http://www-das.uwyo.edu/~jsnider/nasa06/pcasp_report_7.pdf

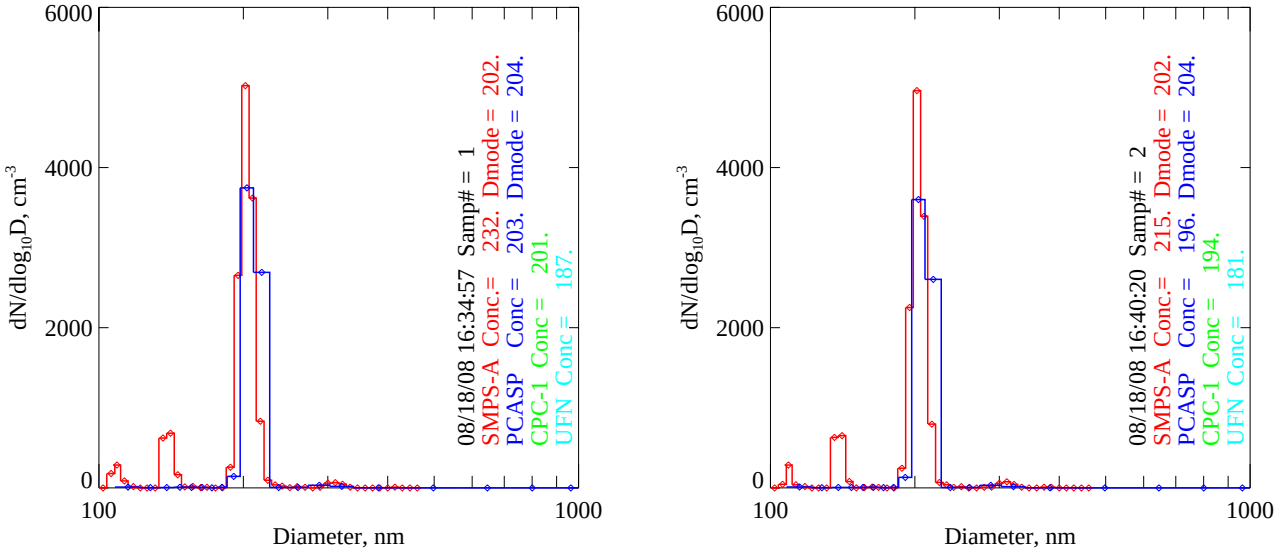
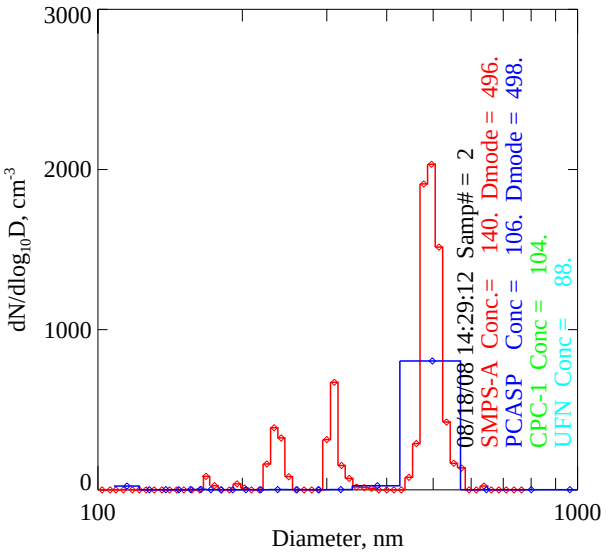


Figure 13NCAR – Here the test aerosol is 199 nm diameter atomized/classified polystyrene latex. Counting agreement (with CPC-1) is good. The sizing, compared to SMPS, is also good. PCASP sizing is estimated using results obtain by Peter Liu for the UWYO PCASP.



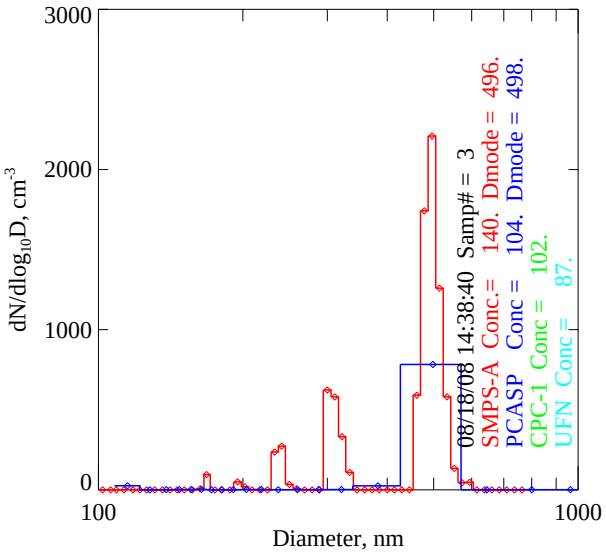
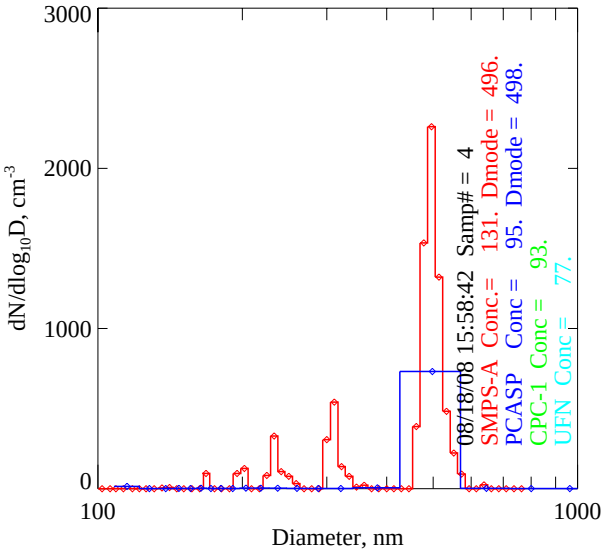


Figure 14UWYO – Here the test aerosol is 491 nm diameter atomized/classified polystyrene latex. Counting agreement (with CPC-1) is good. The sizing, compared to SMPS, is also good. The SMPS "peaks" at 200 and 300 nm are thought to originate from the TSI inversion of the mobility spectrum (i.e., those are not real particles).



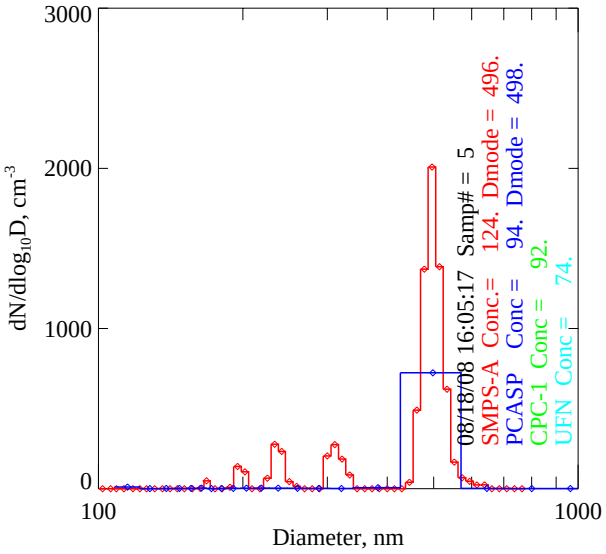


Figure 15NCAR – Here the test aerosol is 491 nm diameter atomized/classified polystyrene latex. Counting agreement (with CPC-1) is good. The sizing, compared to SMPS, is also good. The SMPS "peaks" at 200 and 300 nm are thought to originate from the TSI inversion of the mobility spectrum (i.e., those are not real particles). PCASP sizing is estimated using results obtain by Peter Liu for the UWYO PCASP.

September 3, 2008

In the lab we had two TSI 3010 CPCs, and one PCASP (UWYO, NCAR, SN 23738-0491-08)

For particle sizing we had a classifying SMPS, a scanning SMPS and a NCAR PCASP.

There was on type of test aerosol:
1) atomized/classified polystyrene latex

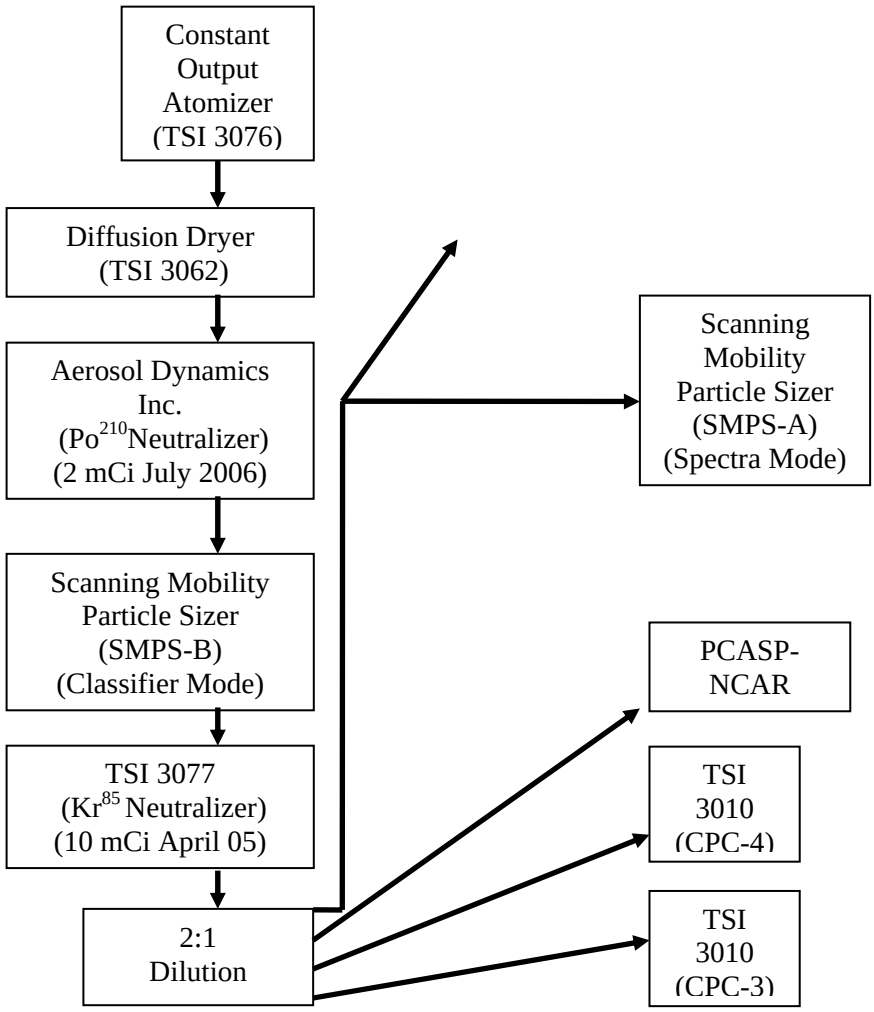
Our most recent results are shown on the following pages. Prior tests, with the UWYO PCASP, are summarized here:

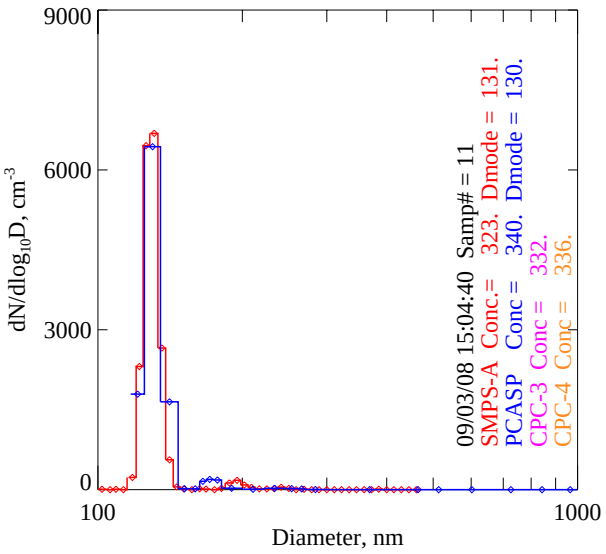
http://www-das.uwyo.edu/~jsnider/nasa06/pcasp_report_7.pdf

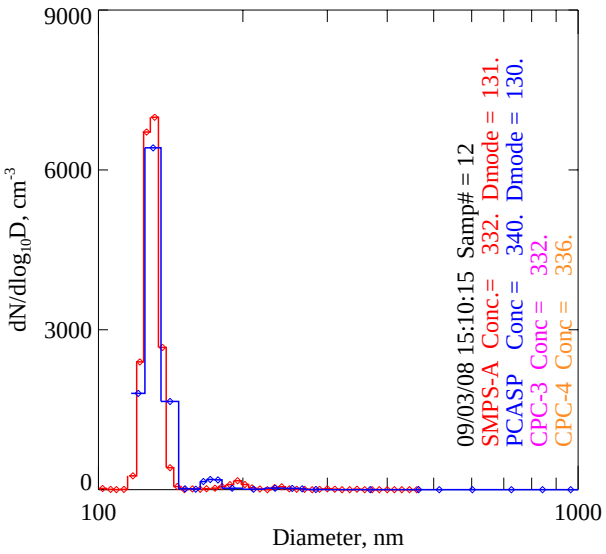
Comment: As part of these tests the bias voltage corresponding to the high gain section of the Baseline Restoration Module was adjusted while challenging the NCAR PCASP with 125 nm PSL particles. At the same time a scope was placed on test point #1. The bias voltage was increase from 0.13 to 0.21 V.

September 3, 2008

Here is a sketch of the lab setup







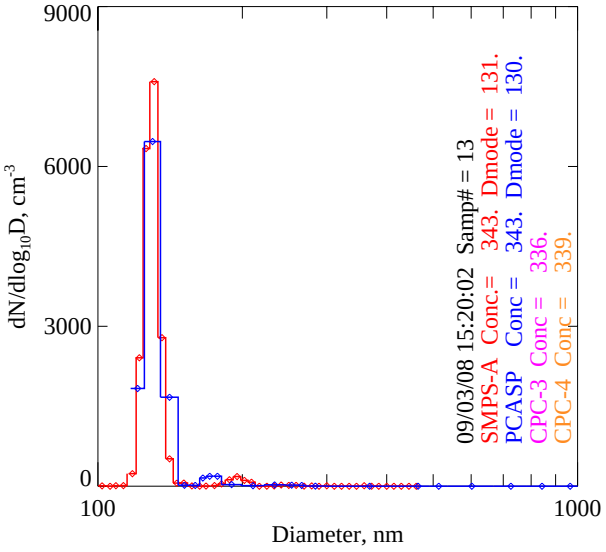


Figure 16NCAR – Here the test aerosol is 125 nm diameter atomized/classified polystyrene latex. Compare with Figure 11NCAR. This test was conducted after adjusting the bias voltage of the high gain section of the Baseline Restoration Module. The bias voltage was increase from 0.13 to 0.21 V. PCASP sizing is shown below in Table 1.

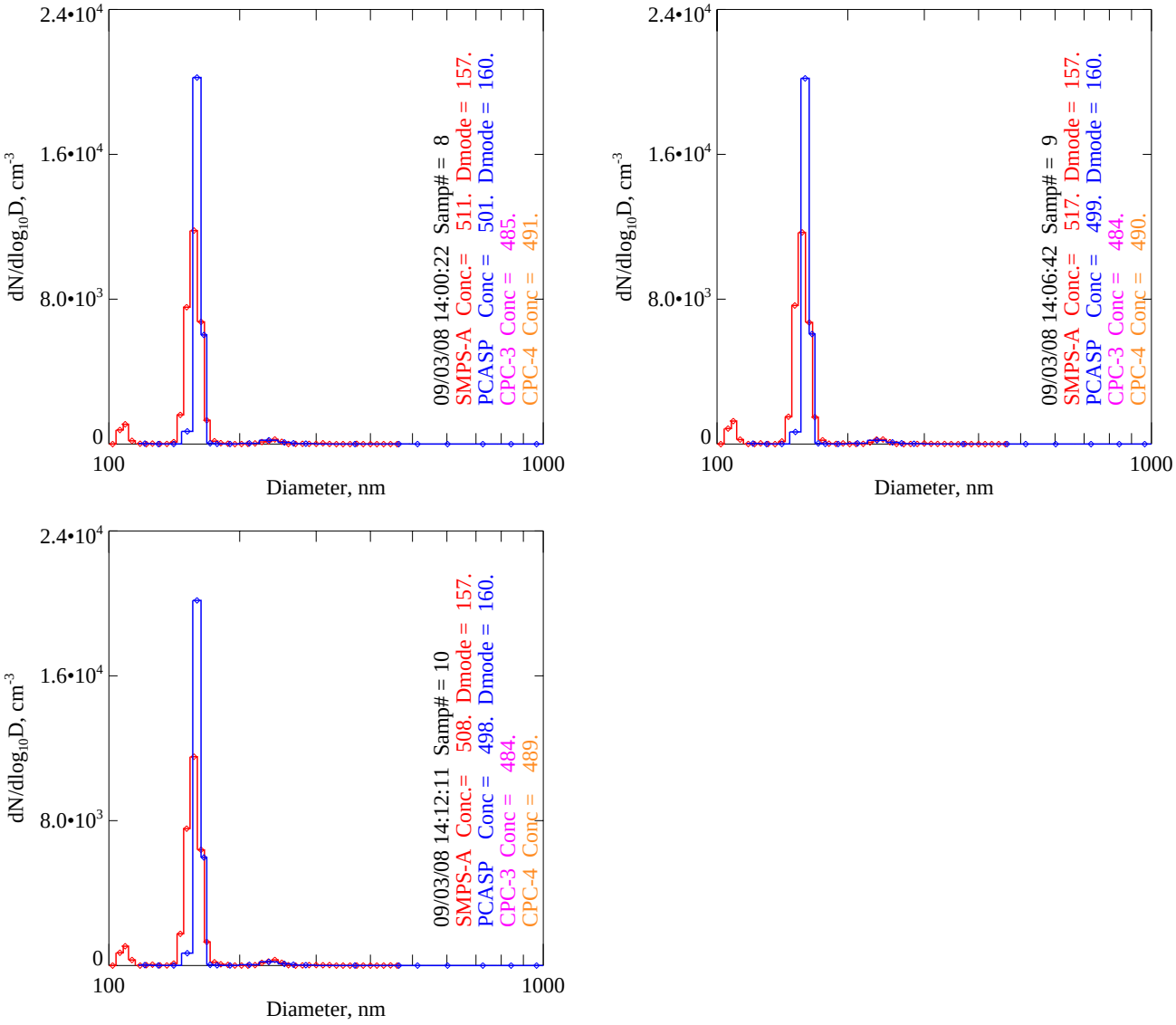
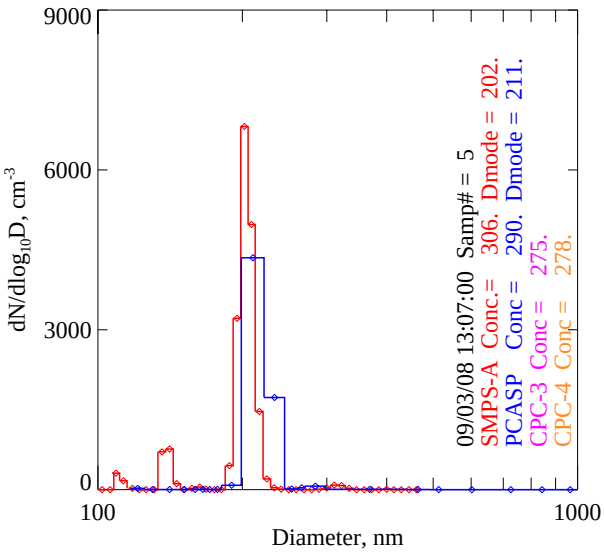
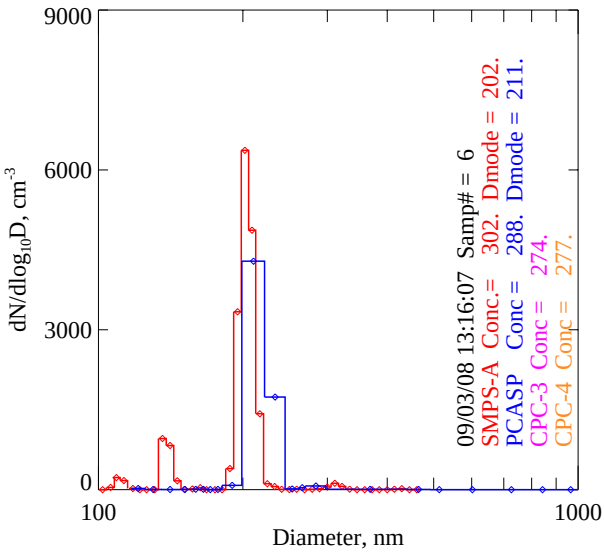


Figure 17NCAR – Here the test aerosol is 152 nm diameter atomized/classified polystyrene latex. These particles are sizing at the PCASP channel #4 (first channel is #0); the final channel of the high gain section of the Baseline Restoration Module. This test was conducted after adjusting the bias voltage of the high gain section of the Baseline Restoration Module. The bias voltage was increase from 0.13 to 0.21 V. PCASP sizing is shown below in Table 1.





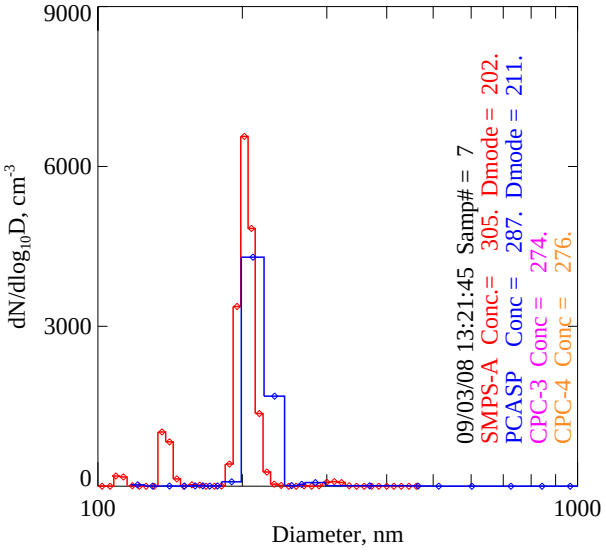


Figure 18NCAR – Here the test aerosol is 199 nm diameter atomized/classified polystyrene latex. No apparent changes from August 18 (compare with Figure 13NCAR). This test was conducted after adjusting the bias voltage of the high gain section of the Baseline Restoration Module. The bias voltage was increase from 0.13 to 0.21 V. The SMPS "peak" at ~120 nm is thought to originate from the TSI inversion of the mobility spectrum (i.e., those are not real particles). PCASP sizing is shown below in Table 1.

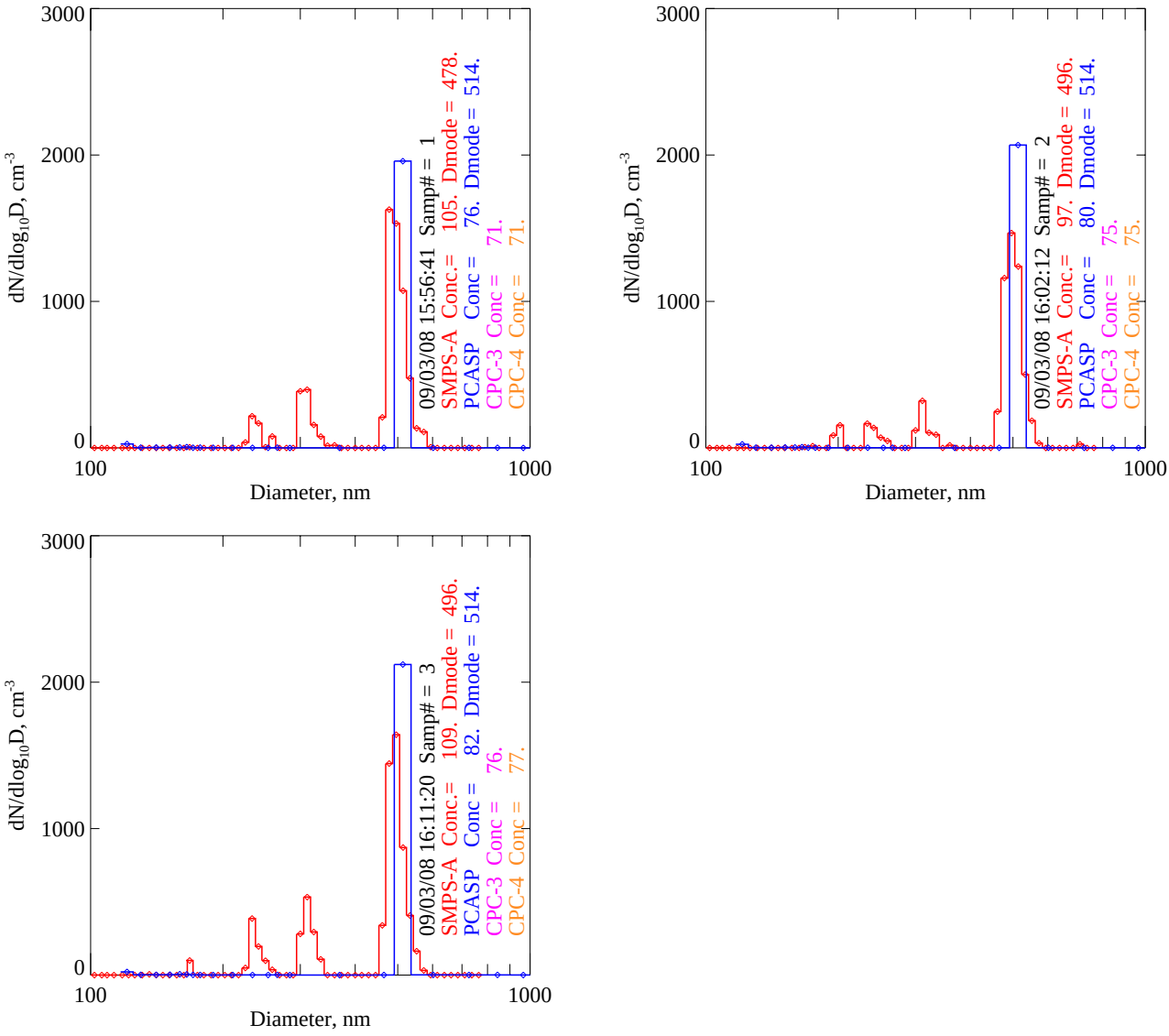
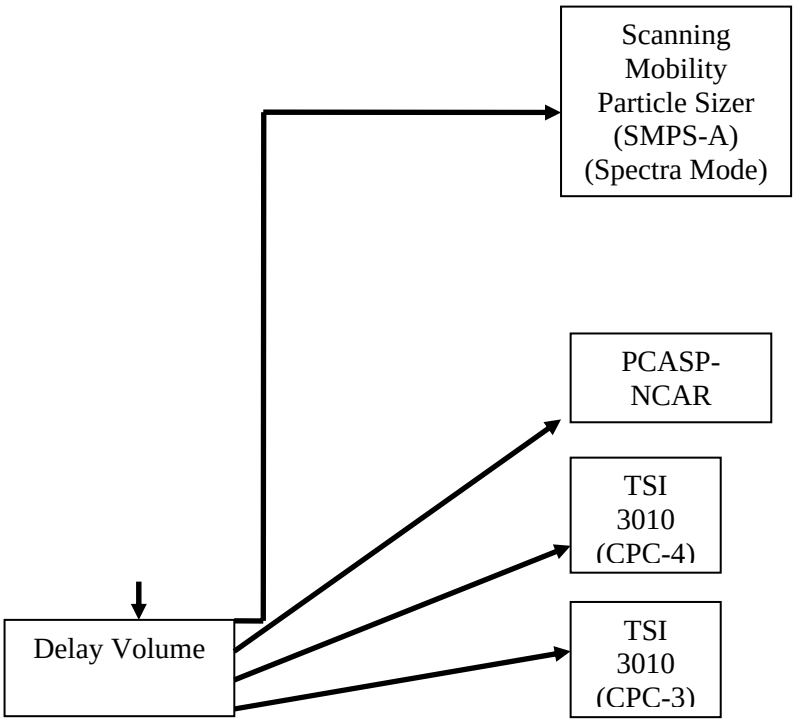


Figure 19NCAR – Here the test aerosol is 491 nm diameter atomized/classified polystyrene latex. No apparent changes from August 18 (compare with Figure 15NCAR). This test was conducted after adjusting the bias voltage of the high gain section of the Baseline Restoration Module. The bias voltage was increase from 0.13 to 0.21 V. The SMPS "peaks" at 220 and 300 nm are thought to originate from the TSI inversion of the mobility spectrum (i.e., those are not real particles). PCASP sizing is shown below in Table 1.

September 5, 2008

Here is a sketch of the lab setup



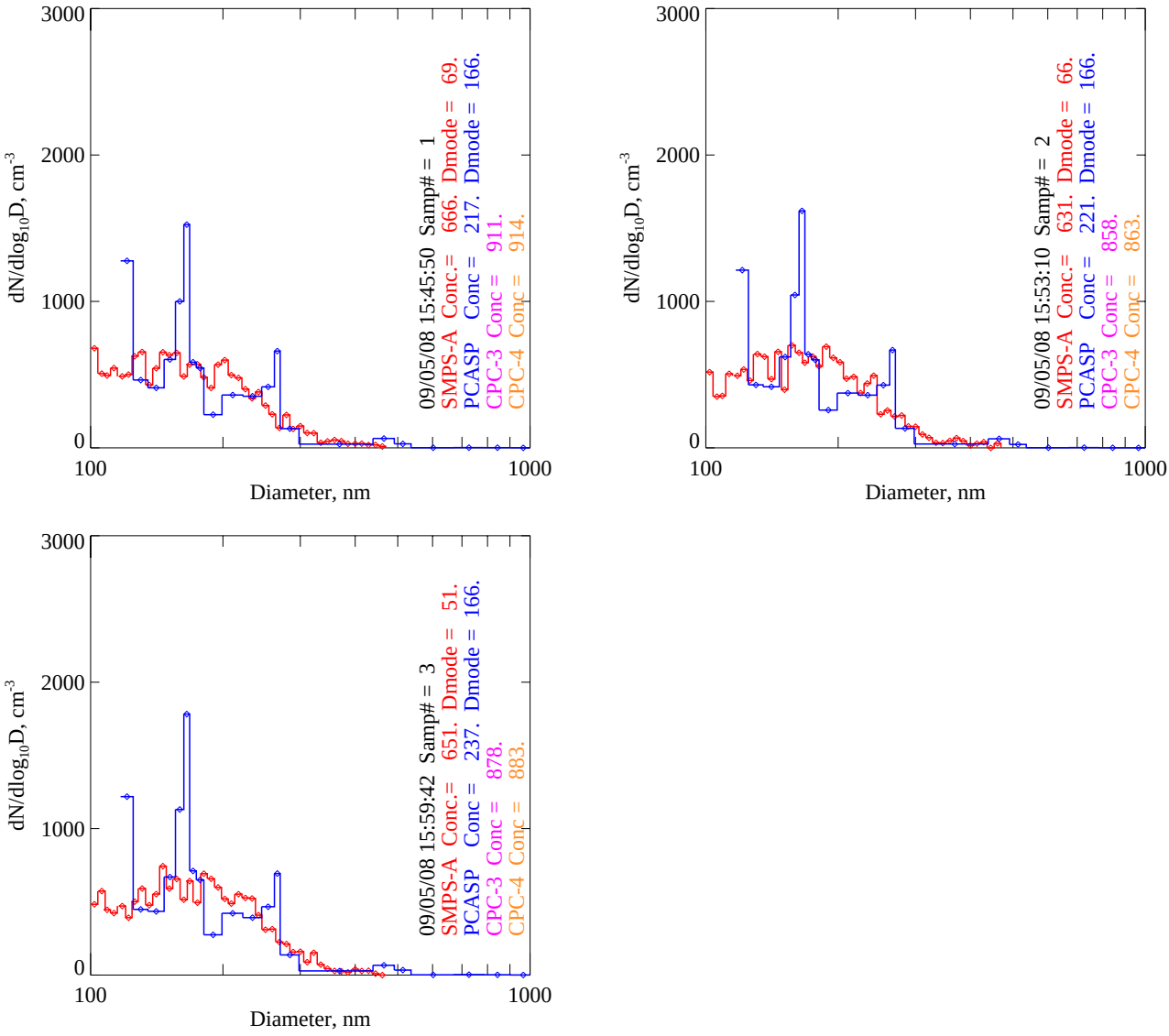
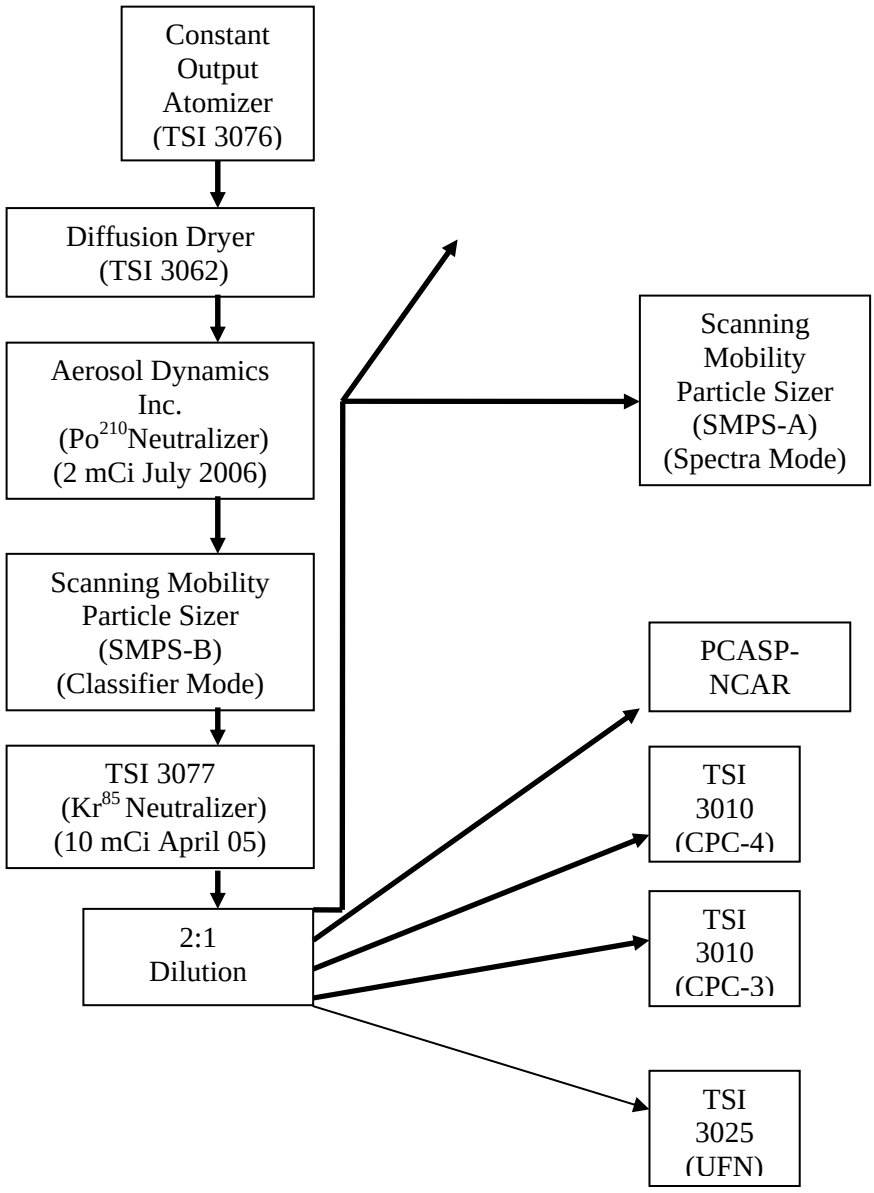


Figure 20NCAR – Ambient aerosol. Compare with Figure 7NCAR. PCASP sizing is shown below in Table 1.

February 14 and 17, 2009

Here is a sketch of the lab setup



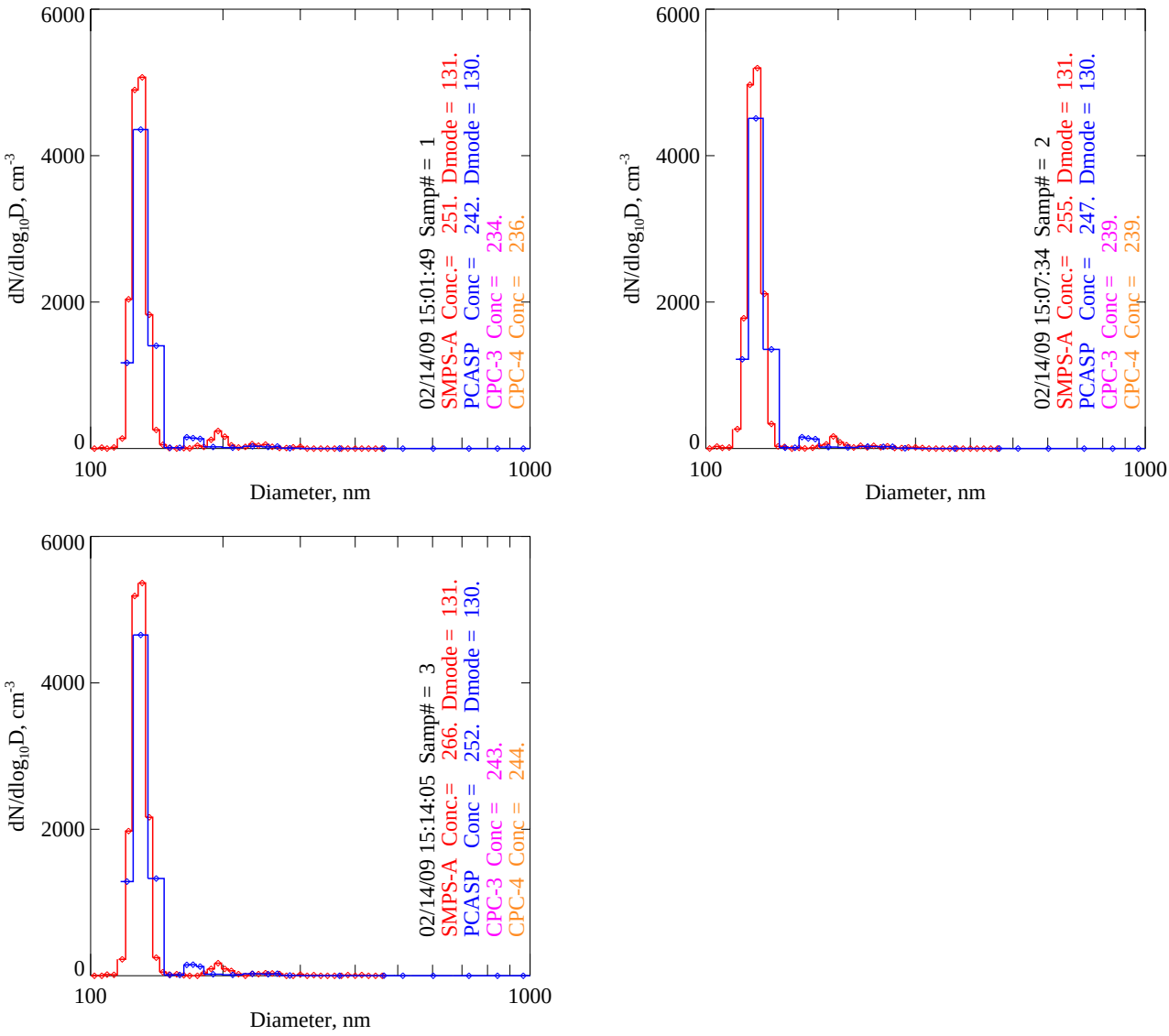
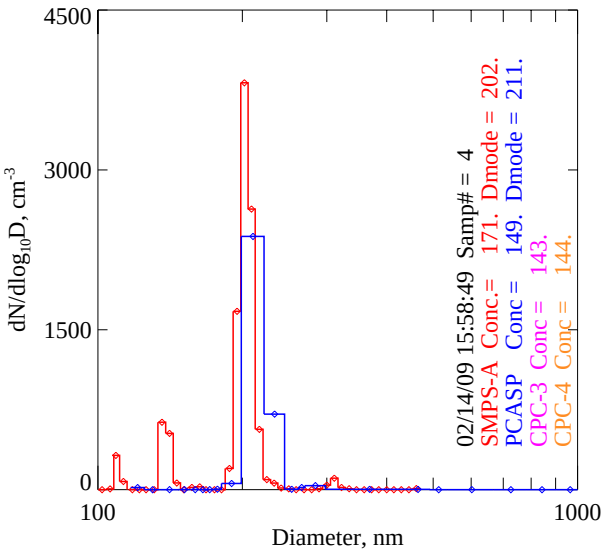
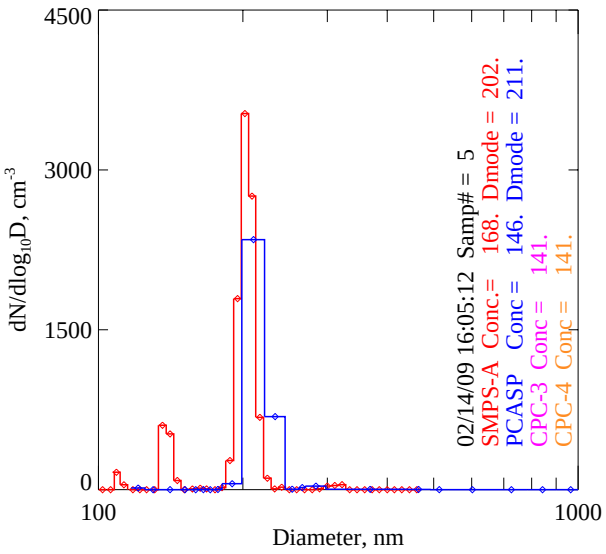


Figure 21NCAR – Here the test aerosol is 125 nm diameter atomized/classified polystyrene latex. PCASP sizing is shown below in Table 1.





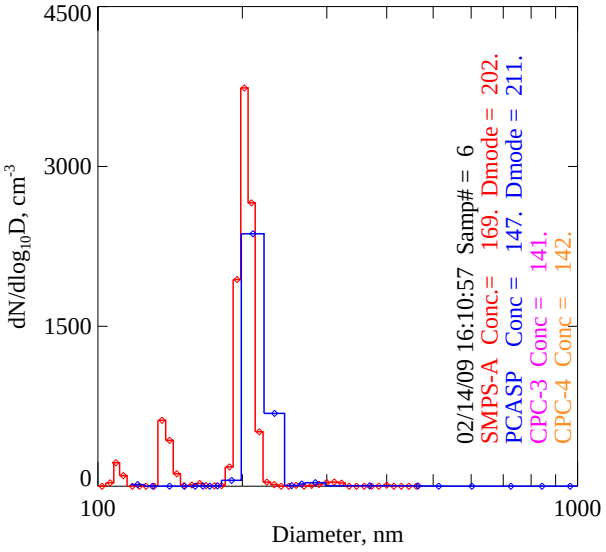


Figure 22NCAR – Here the test aerosol is 199 nm diameter atomized/classified polystyrene latex. The SMPS "peak" at ~120 nm is thought to originate from the TSI inversion of the mobility spectrum (i.e., those are not real particles). PCASP sizing is based on results shown in Table 1.

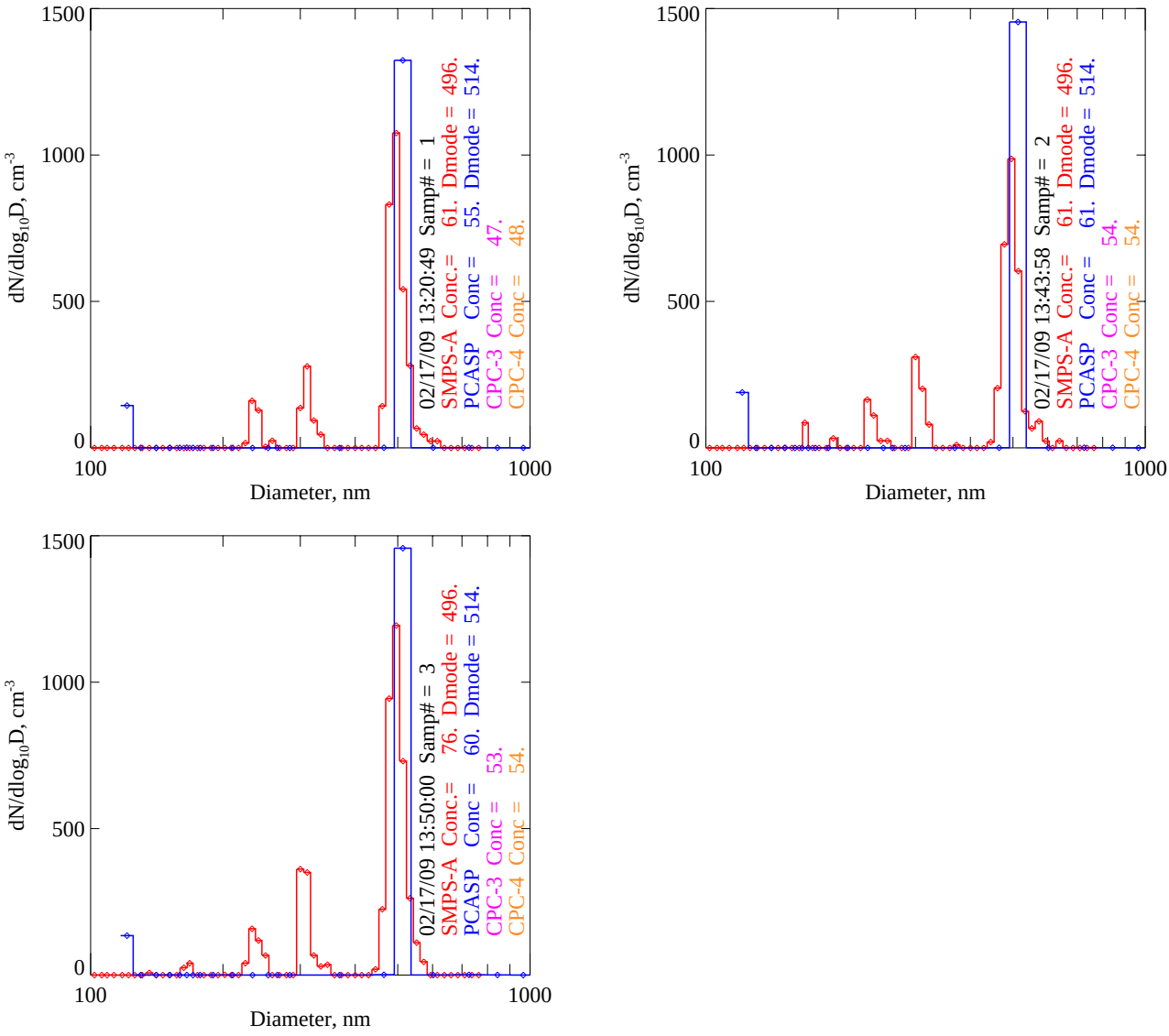


Figure 23NCAR – Here the test aerosol is 491 nm diameter atomized/classified polystyrene latex. . The SMPS "peaks" at 220 and 300 nm are thought to originate from the TSI inversion of the mobility spectrum (i.e., those are not real particles). PCASP sizing is based on results shown in Table 1.

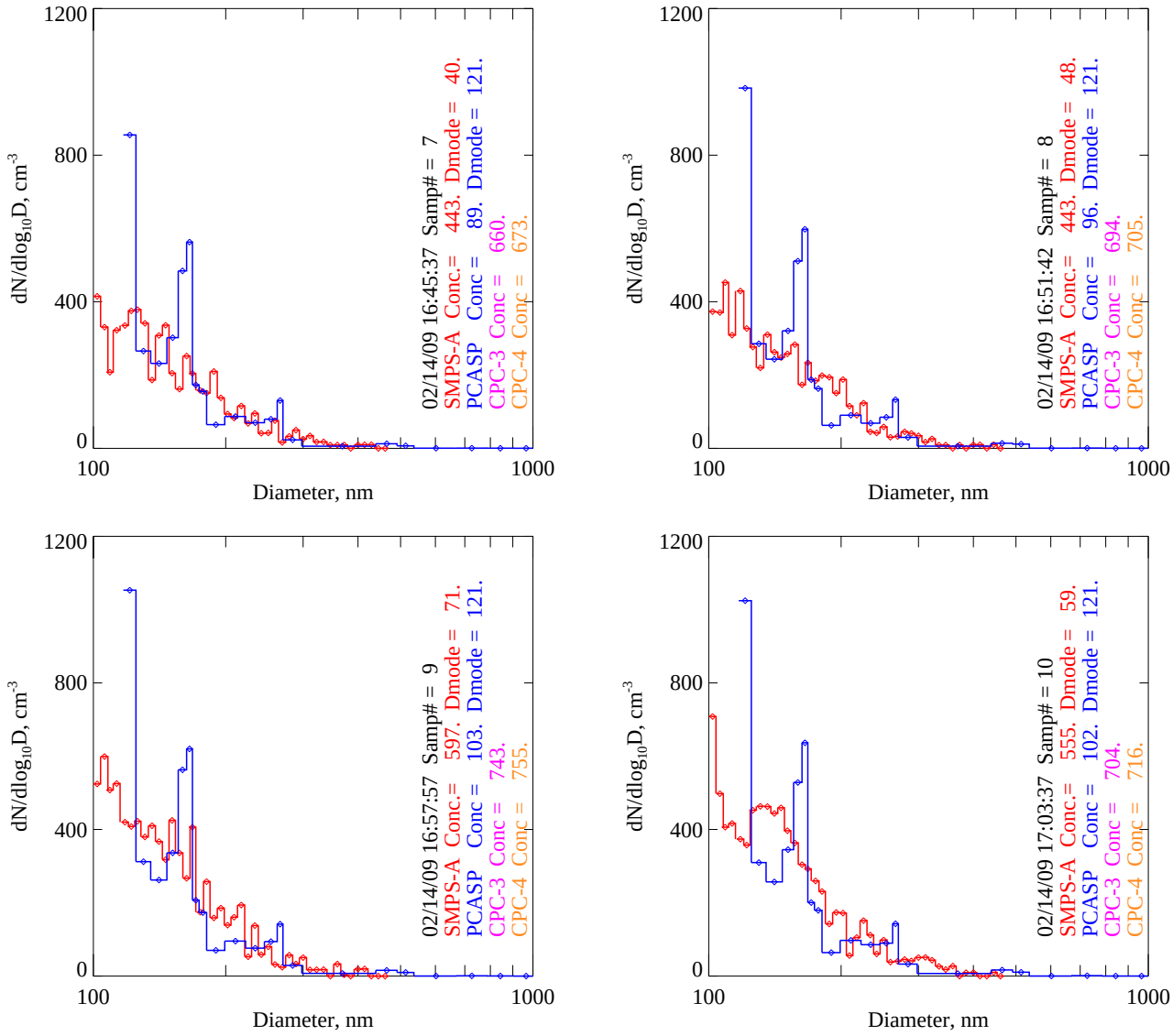


Figure 24NCAR – Ambient aerosol. PCASP sizing is based on results shown in Table 1.

Table 1 – Sizing applied to NCAR PCASP measurements made in the Keck Aerosol Laboratory

high gain	
Threshold	PSL Diameter, um
692	0.117
1146	0.125
1814	0.135
2769	0.147
4096	0.156
mid gain	
Threshold	PSL Diameter, um
4192	0.163
4231	0.168
4282	0.174
4348	0.181
4537	0.199
4825	0.222
5251	0.245
5859	0.262
6703	0.270
8192	0.298
low gain	
Threshold	PSL Diameter, um
8335	0.439
8435	0.491
8520	0.536
8768	0.668
8981	0.784
9194	0.902
9418	1.028
9579	1.120
9825	1.261
10080	1.409
10460	1.632
10872	1.874
11322	2.137
11759	2.391
12288	2.690