

ARM Mobile Facility II – Aerosol Observing System, Initial Deployment at StormVEx 2010

Stephen R. Springston

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ASR, Aerosol Working Group, Boulder, CO



BROOKHAVEN
NATIONAL LABORATORY

a passion for discovery



2009 ASP Meeting Santa Fe, New Mexico

2/26/2009



This document is a list of capital equipment for the joint ARM/ASP program. The list is separated into individual sheets based on deployment location. Locations include: 1) The G-1 ARM/ASP Aerial Facility, 2) The ARM/ASP Mobile Facility, 3) ARM/ASP Ground Site I, 4) ARM/ASP Ground Site II, and 5) Laboratory Use. Note: Item are not prioritized in these lists.

Equipment for the ARM/ASP Mobile Facility

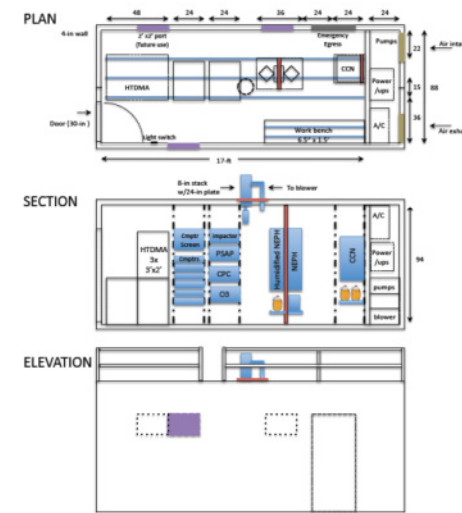
2/26/2009

Item	Cost (k\$)
Research Data System (Interchangeable with G-1, cost on G-1 AAF page)	
Humidigraph (3 RHs with single wavelength nephelometers)	75
Three-Wavelength Nephelometer (TSI Model 3560)	75
Aerosol Mass Spectrometer (AMS)	350
Single Particle Soot Photometer (DMT Model SP2)	150
Particle Into Liquid Sampler (PILS-IC-WSOC)	250
Ultra-High Sensitivity Aerosol Spectrometer (DMT Model UHSAS with enhancements)	110
Scanning Mobility Particle Sizer (SMPS)/Fast Integrated Mobility Spectrometer (FIMS)	250
Fast 3-Wavelength Photoacoustic Spectrometer	115
Dual Column Cloud Condensation Nuclei Counter (DMT Model CCN)	



7/9/2009

8/14/2009





7/13/2010



7/21/2010



9/17/2010



10/3/2010



Equipment

MAOS

CCN-200
PSAP
Aethalometer
PASS-3
SP2 (~5 GB/h!!)
Dual Nephelometer Hygrometer
CPC (>10 nm)
CPC (>2.5 nm)
UHSAS
SMPS
HTDMA
PILS
PTRMS
ACSM
Carbon Monoxide
Ozone
Sulfur Dioxide
NO_x (NO, NO₂, NO_y)
Local Meteorology
SODAR
Profiler

AMFII AOS

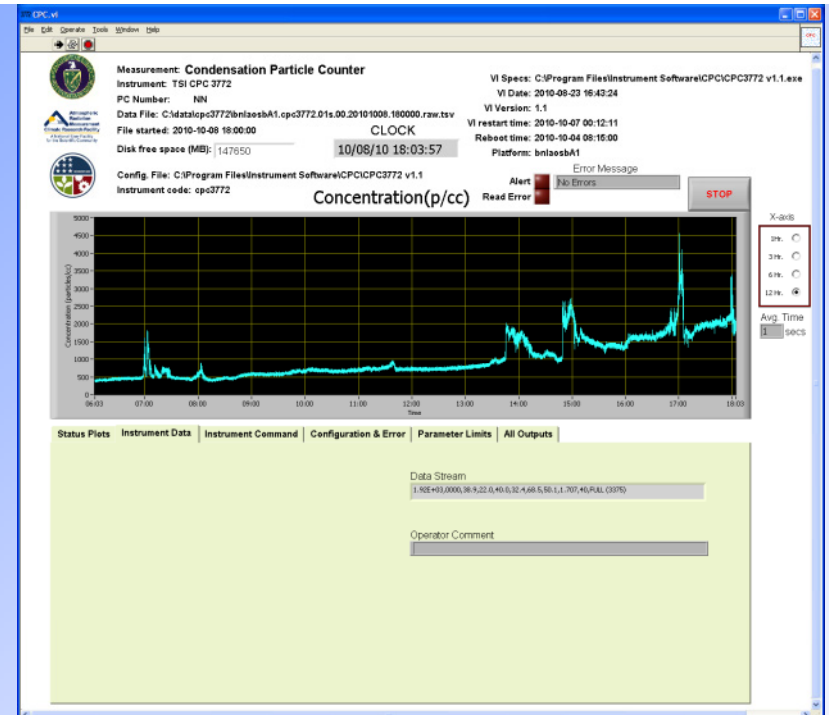
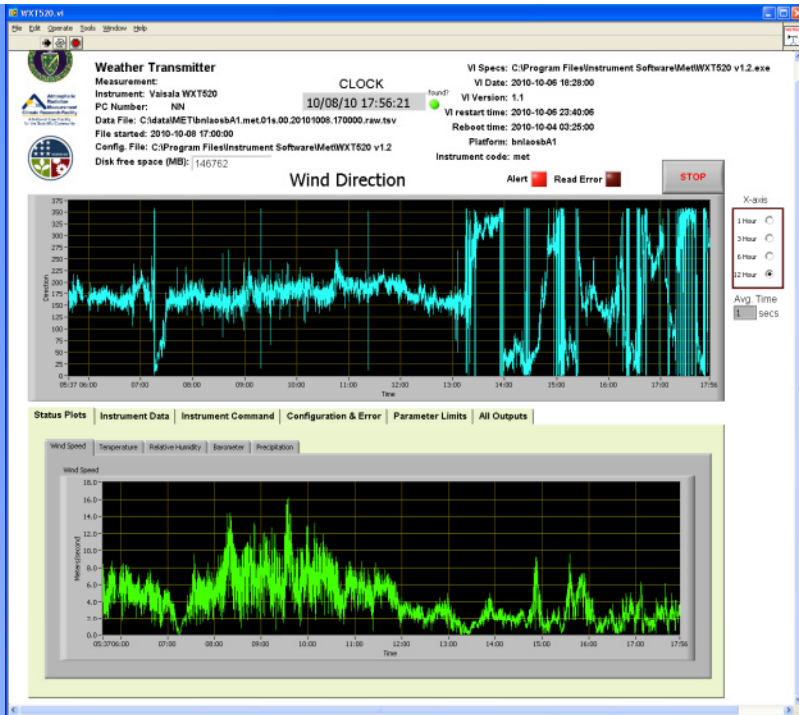
CCN-100
PSAP
Dual Nephelometer Hygrometer
CPC (>10 nm)
HTDMA
Ozone
Local Meteorology
SP2 (ARRA), guest
Aerodyne CAPS, guest
SMPS (Hallar), guest

TWP-D AOS

CCN-100
PSAP
Dual Nephelometer Hygrometer
CPC (>10 nm)
ACSM
HTDMA
Ozone
Local Meteorology

AAF (BNL Participation)

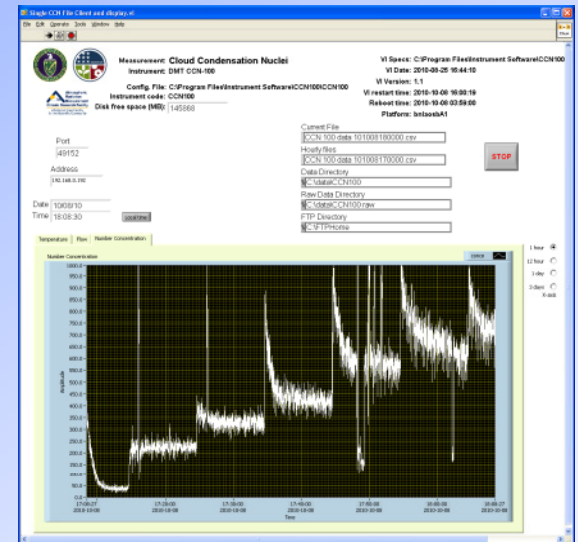
PILS
SMPS
SP2
Carbon Monoxide
Ozone
Sulfur Dioxide
NO_x (NO, NO₂, NO_y)



CYear-CMon-C	CHour:CMin:C	Direction	Speed	Air Temp	RH
2010-10-08	18:00:00.22	186	2.3	4.7	77.1
2010-10-08	18:00:01.22	184	2.1	4.7	77.1
2010-10-08	18:00:02.22	176	1.9	4.7	77.1
2010-10-08	18:00:03.21	177	1.8	4.7	77.1
2010-10-08	18:00:04.21	176	1.6	4.7	77.1
2010-10-08	18:00:05.22	174	1.5	4.7	77.1
2010-10-08	18:00:06.22	171	1.6	4.7	77.3
2010-10-08	18:00:07.22	172	1.8	4.7	77.4
2010-10-08	18:00:08.22	173	1.9	4.7	77.4
2010-10-08	18:00:09.21	166	2.3	4.7	77.9
2010-10-08	18:00:10.22	162	2.6	4.7	78.3
2010-10-08	18:00:11.22	167	2.7	4.7	78.3
2010-10-08	18:00:12.22	168	2.7	4.7	79
2010-10-08	18:00:13.22	174	2.6	4.7	79.4
2010-10-08	18:00:14.22	185	2.5	4.7	79.4

CYear-CMon-C	CHour:CMin	Concentra	InstrErrs	Satur Terr	Cond Terr
		parts/cc	code	deg C	deg C
2010-10-07	19:00:00.49	767	0	39	22
2010-10-07	19:00:01.58	731	0	38.9	22
2010-10-07	19:00:02.49	719	0	38.9	22
2010-10-07	19:00:03.49	762	0	38.9	22
2010-10-07	19:00:04.49	744	0	38.9	22
2010-10-07	19:00:05.49	717	0	38.9	22
2010-10-07	19:00:06.49	722	0	38.9	22
2010-10-07	19:00:07.49	719	0	38.9	22
2010-10-07	19:00:08.49	747	0	38.9	22
2010-10-07	19:00:09.49	754	0	38.9	22
2010-10-07	19:00:10.49	746	0	38.9	22

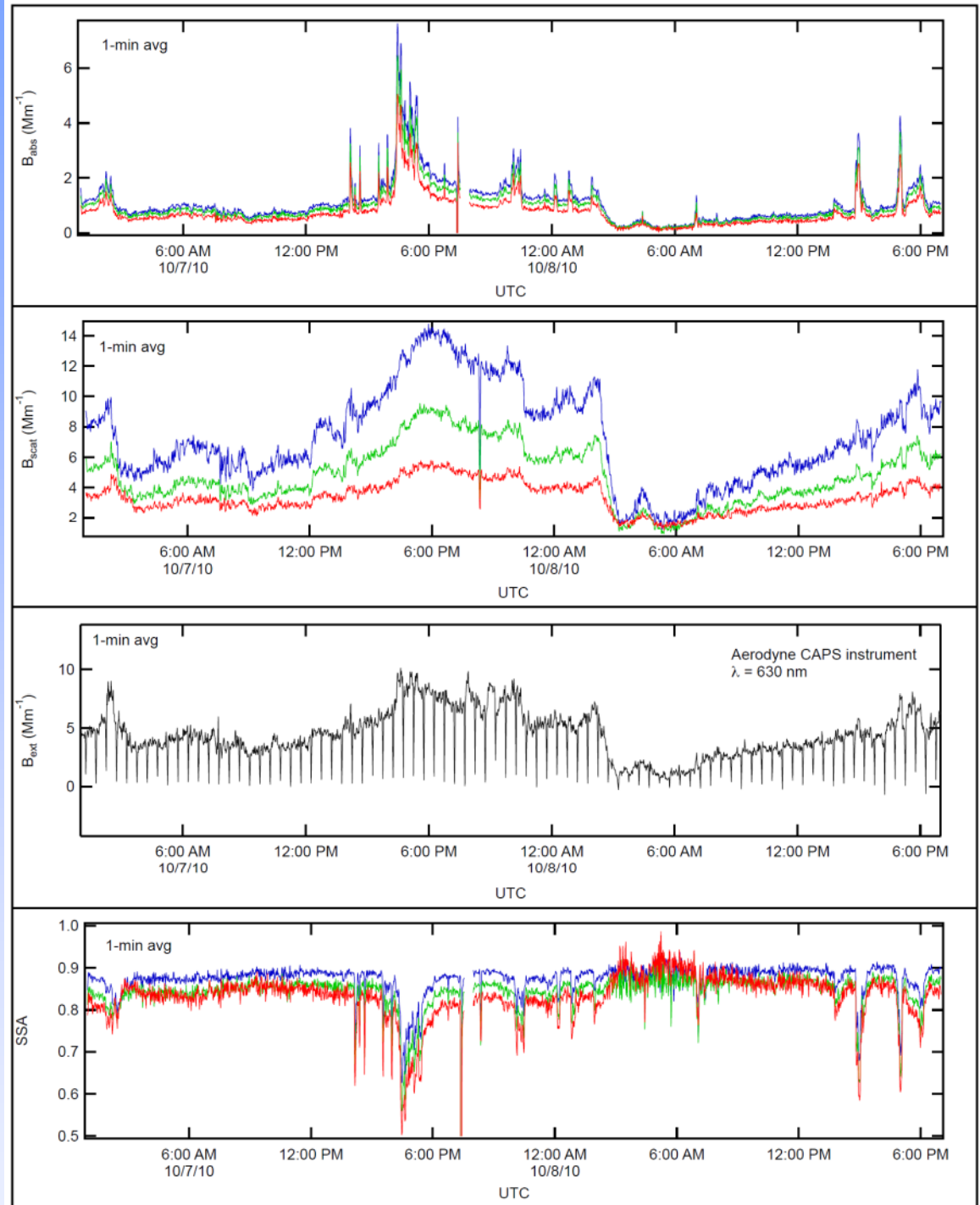
CCN-100 Data



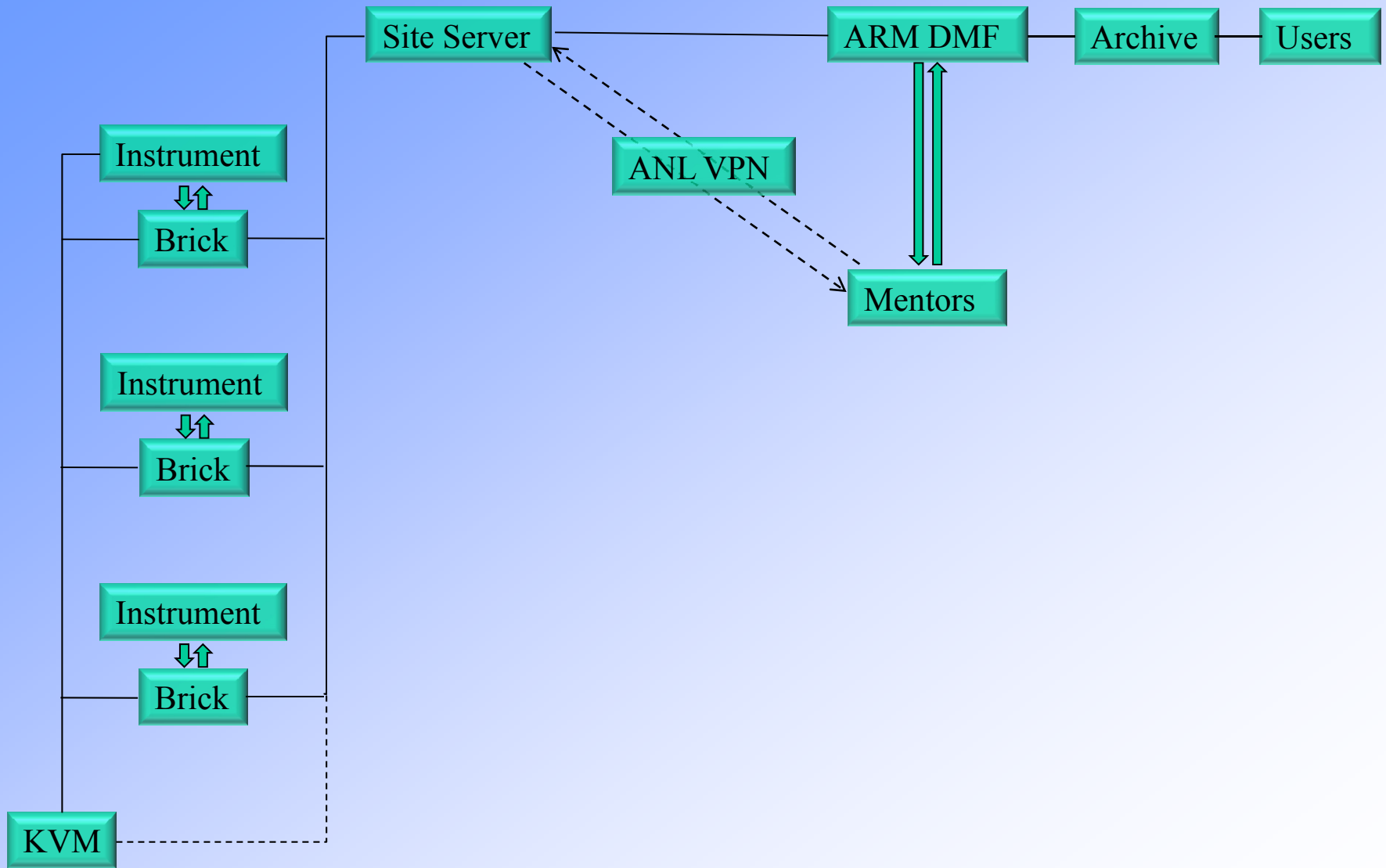
File: c:\CCN data\CCN 100 data
 101008190000.csv
 Date 2010-08-10
 Time 19:00:00

Time	Current	Temps		T1 Set	T1 Read	T2 Set	T2 Read
	SS	Stabilized	Delta T				
19:00:00	0.6	1	9.63	26.6	26.44	31.42	31.17
19:00:01	0.6	1	9.63	26.6	26.47	31.42	31.19
19:00:02	0.6	1	9.63	26.6	26.44	31.42	31.17
19:00:03	0.6	1	9.63	26.6	26.47	31.42	31.17
19:00:04	0.6	1	9.63	26.6	26.45	31.42	31.16
19:00:05	0.6	1	9.63	26.6	26.46	31.42	31.16
19:00:06	0.6	1	9.63	26.6	26.46	31.42	31.16
19:00:07	0.6	1	9.63	26.6	26.45	31.42	31.17

Already looking at the data!



Data Route



Character

- Self Contained (just add power and internet)
- Fast Setup (2-h to erect railing, sampling mast, power on)
- Portable/Robust
 - Instruments permanently installed (shock mounted), plumbed, wired (CCN putting out data in 1 h, warm up 6-h)
 - Pumps, electrical service entrance pre-installed in ventilated vestibule
 - External items shipped internally (railing, inlet)
 - Turtle mode in ~8 h (< 2 h)
- Flexible
 - Heat/Cold, Wind
 - Marine/Land
 - Guest instruments (power, rack space, sampling, computers)
 - Bandwidth availability
 - Comparability
- Smart Control
 - ‘Master’ Computer
 - Local/Remote control of individual systems (2 independent ways)
 - Remote/Auto Restart and Shutdown

Features



Features



Thanks!



Top Row: Larry Milian, Scott Smith, Stephen Springston, Art Sedlacek
Bottom Row: Yin-Nan Lee, Cindy Salwen, Nancy Warren, Judy Williams, Lisa Morello, Bill Behrens, Gunnar Senum
Not Shown: Gabe Vignato