

# AAF Data AMY-2008 (part1) at Zhangye, China

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## 1. Deployment

Two ground-based mobile laboratories built at NASA Goddard Space Flight Center (<http://smart-commit.gsfc.nasa.gov>) complementing the ARM Mobile Facility (AMF) were deployed as the ARM Ancillary Facility (AAF) in China in 2008. From April-June, AAF was in Zhangye, a semi-arid region between the Taklimakan and Gobi deserts, to capture and characterize airborne dust near the source region. Located on a dry riverbed at an observatory (<http://qx.zhangye.gov.cn/tzxz/200808/94334.html>), over three-dozen sensors worked together to observe the environment.



The Zhangye site is located in western China.



SMART trailer with radiometers on roof; COMMIT trailer with inlet on top. Radar station is in sight in the distance.



Surface properties

## 2. Major Instruments

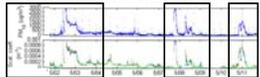
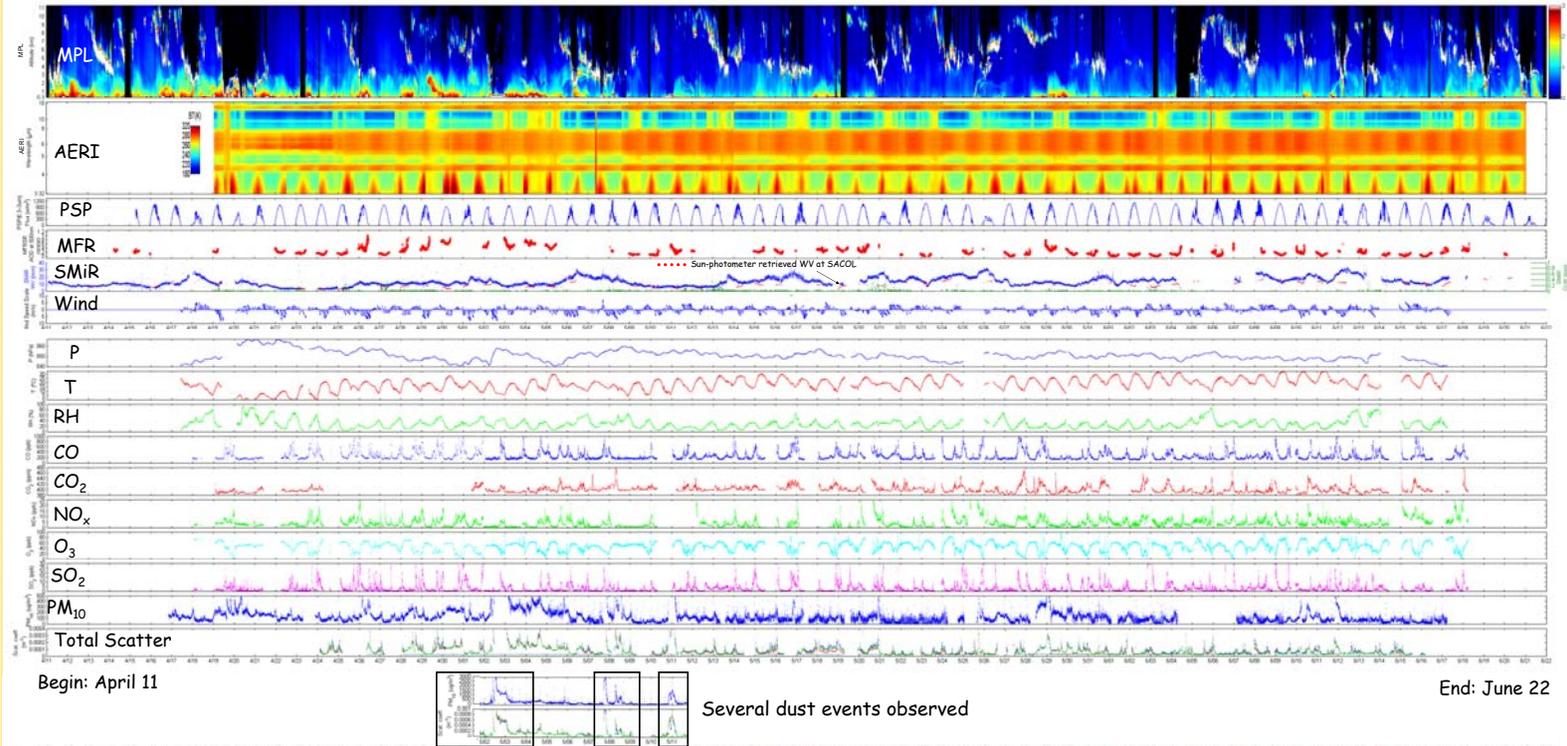
### SMART (Surface-sensing Measurement for Atmospheric Radiative Transfer)

- Sun Photometers (Cimel, MFR) ----- direct/diffuse solar radiation at 6 wavelengths
- Broadband Radiometers (PSP, NIP, PIR) - downward irradiances in 3 wavelength bands
- Spectrometer (AERI) ----- IR spectra
- Total Sky Imager (TSI) ----- a picture of the entire sky every 10 seconds
- Micro Pulse Lidar (MPL) ----- vertical structure of aerosol, cloud height
- Microwave Radiometer (SMiR) ----- water vapor in the atmosphere

### COMMIT (Chemical, Optical, and Microphysical Measurements of In-situ Troposphere)

- Particle Sizer (APS) ----- size distribution of aerosol particles
- Particulate Monitor (TEOM/ACCU) - mass concentration/chemical compositions
- Nephelometer ----- scattering/back scattering coefficients
- PSAP ----- absorption coefficients at 3 wavelengths
- Gas Monitors ----- trace gases CO, CO<sub>2</sub>, O<sub>3</sub>, SO<sub>2</sub>, NO and NO<sub>2</sub>
- Meteorological Sensors ----- P, air/surface T, RH, wind, rain rate, visibility

## 3. Selected time series



Several dust events observed



Looking west. Not an overly hazy day

During a dusty event on May 8

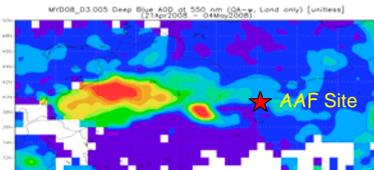


A day with cirrus clouds



Dust devils are frequent visitors

Cloud-free day of surrounding area on May 12, 2008



Example of DeepBlue retrieved AOT



On the sandy surface somebody didn't make it, but we survived!

## 4. Summary

More frequently than commonly expected, multiple dust events have been identified, including those that occurred during the nighttime with strong episodes as late as mid June. Local pollution was seen almost every day, making it more interesting when mixed with dust.