*ARM Science Team Meeting, 2009*

# An overview of the concurrent Chinese field experiments and dust activities in western China.

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**March 30-April 3,2009**


兰州大学半干旱气候与环境观测站

Semi-Arid Climate and Environment Observatory of Lanzhou University (SACOL)

# *Content*

- Introduction
- Field Campaign
- Preliminary Results

## ✓ Introduction

**Arid and Semi-Arid areas comprise about 30% of the Earth surface.**

**Changes in climate and climate variability likely will have a significant impact on these regions. The semi-arid region over Northwest China is a special semi-arid land surface and part of the dust aerosol source.**

To improve understanding and capture direct evidence of the impact of dust aerosol on semi-arid climate, a 2008 joint China-United States of America field campaign was conducted.

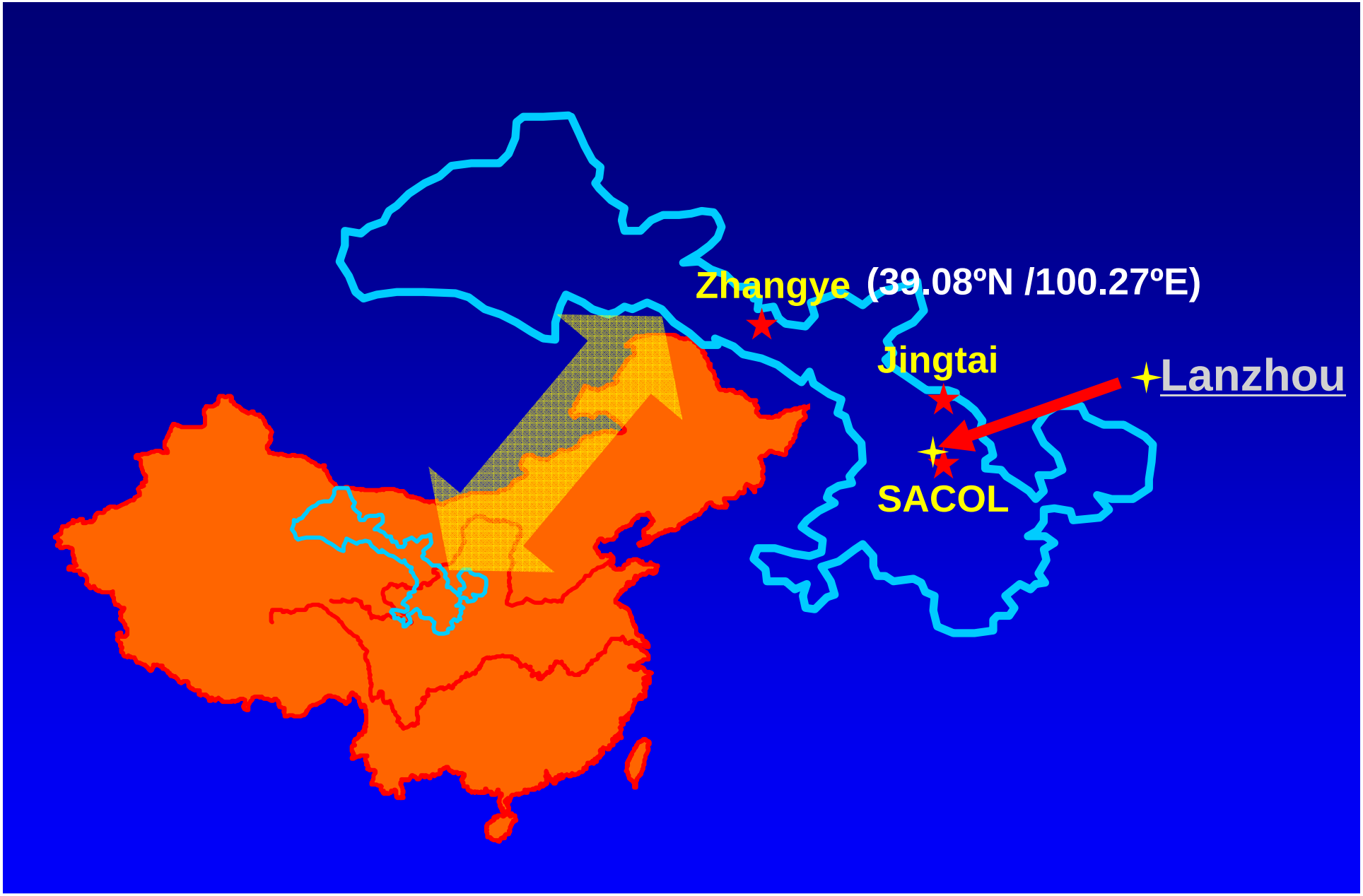
# *Field Campaign*

**Three sites were involved in this campaign, including:**

**One permanent site at the Semi-Arid Climate & Environment Observatory of Lanzhou University (SACOL) located in Yuzhong, 35.95ºN /104.1ºE;**

**One SACOL's Mobile Facility (*SMF*) deployed in Jingtai, 37.57º N /104.23ºE; and**

**The U.S. Department of Energy (DoE) Atmospheric Radiation Measurements (ARM) Ancillary Facility (AAF mobile laboratories, *SMART-COMMIT*) deployed in Zhangye, 39.08ºN /100.27ºE.**

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# SACOL 35.95ºN /104.1ºE

http://climate.lzu.edu.cn

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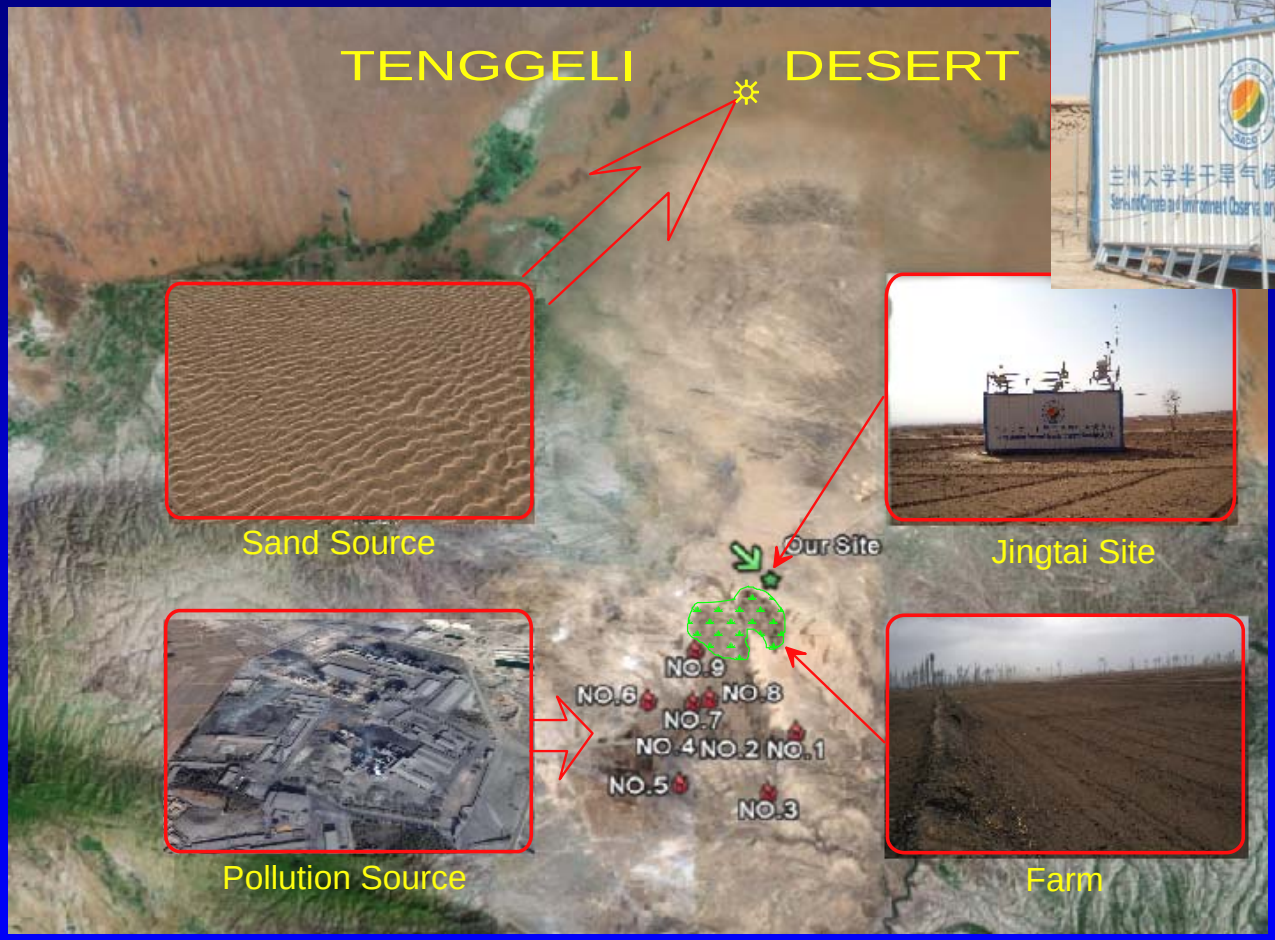
# ❖Instruments SACOL


- Micro-Pulse Lidar
- Microwave Radiometers
- Total Sky Image
- Boundary Layer
- Surface radiation
- Solar Broadband
- Solar Narrowband
- Solar Spectral
- Contrast
- Surface Fluxes
- Soil Parameters
- Ambient Air Quality
- Aerosol Optical Properties

# JINGTAI 37.57º N /104.23ºE

SMF


**Feb 26-May 31**

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# ❖Instruments Jingtai

- Broadband Radiometers(CM21,CG4,NIP)
- MFRSR
- Sun-photometers(Cimel CE318)
- Total Sky Imager (TSI-440)
- MPL-4
- Nephelometer (TSI 3563)
- Meteorological sensors
- LAS

# ZHANGYE



## SMART:

**Broadband Radiometers(PSP,NIP)**
**Sun-photometers(Cimel)**
**SMiR**
**AERI(Spectrometer)**
**Total Sky Imager(TSI)**
**MPL**

## COMMIT

**Particle Sizer**
**Nephelometer**
**PSAP**
**Gas Monitors**
**Meteorological sensors**
**Particle Monitor (TEOM)**

**Apr 11-Jun 22**

**http://smart-commit.gsfc.nasa.gov**

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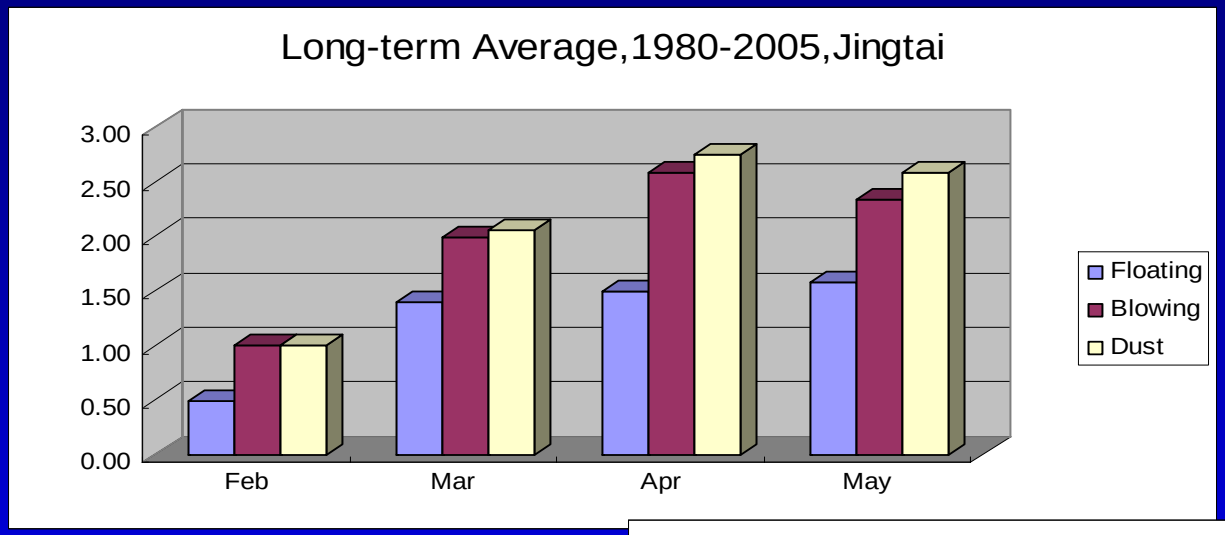
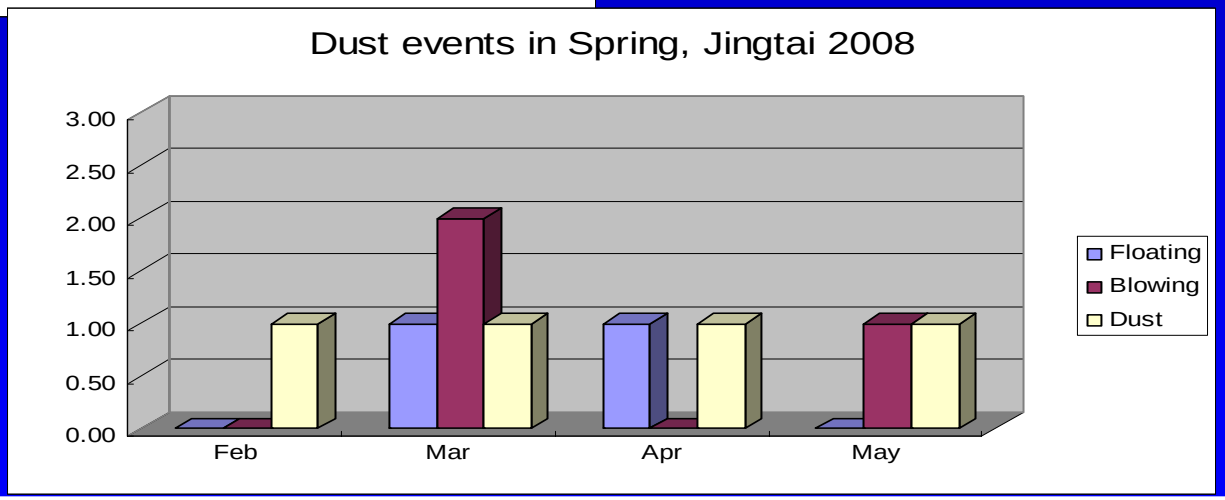
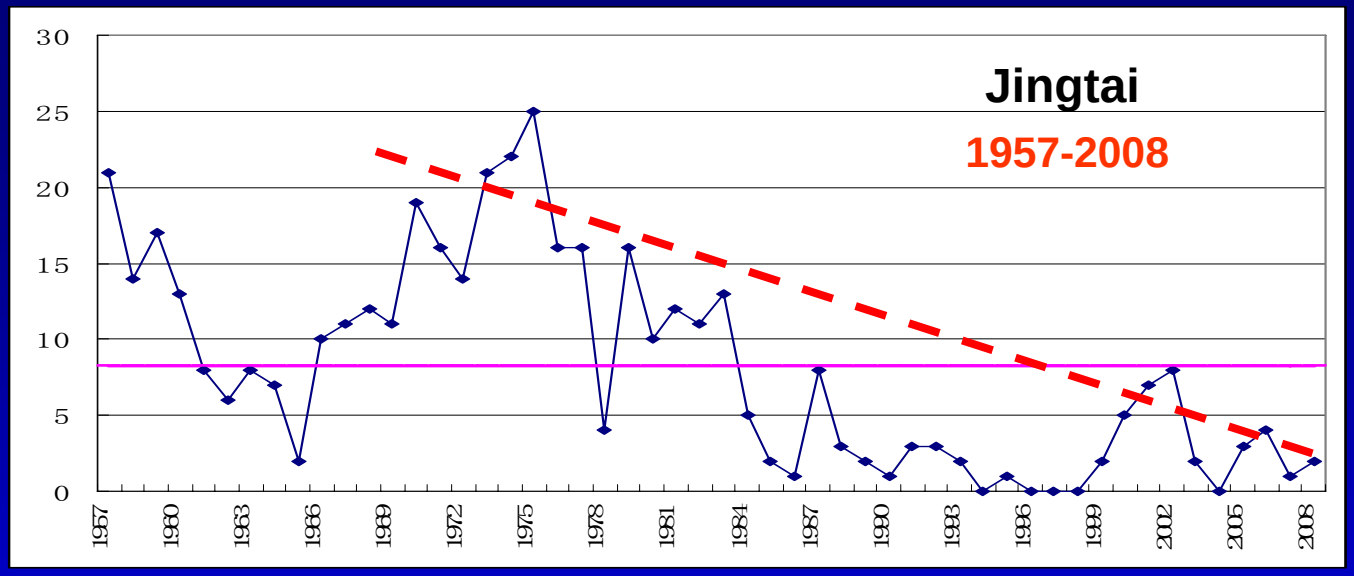
# Preliminary Results

# Dust Activities

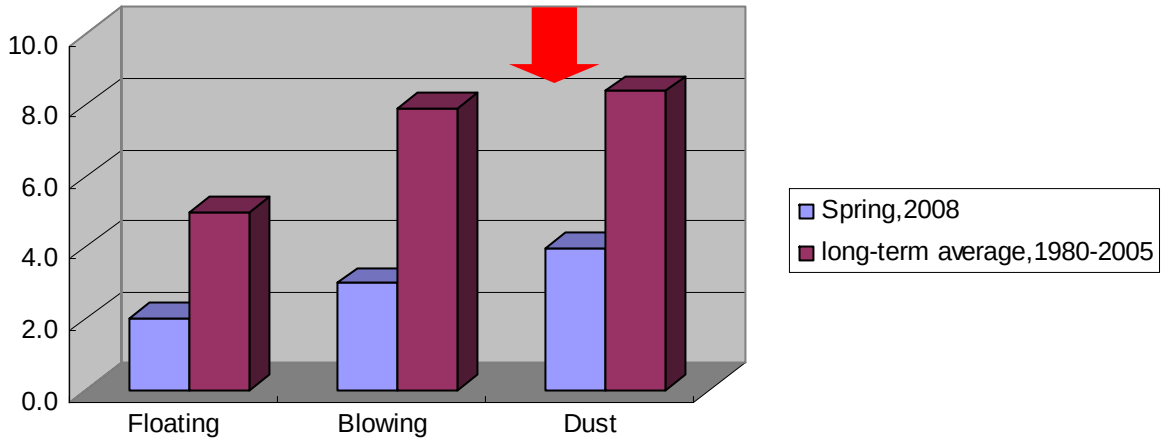


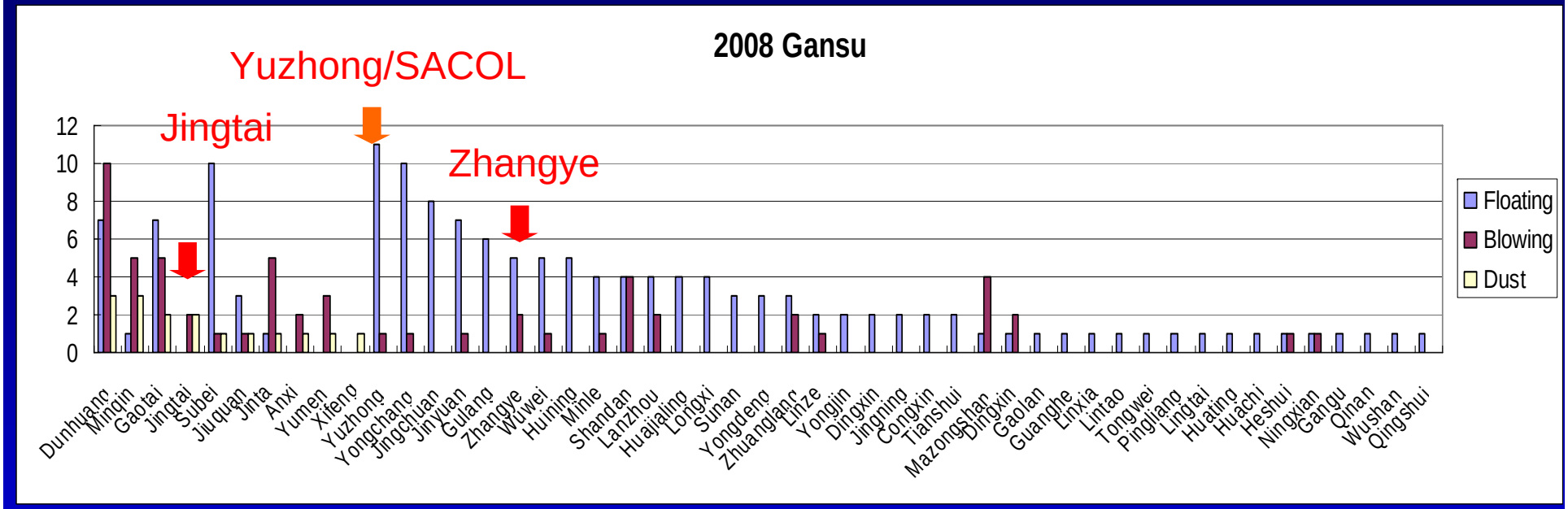



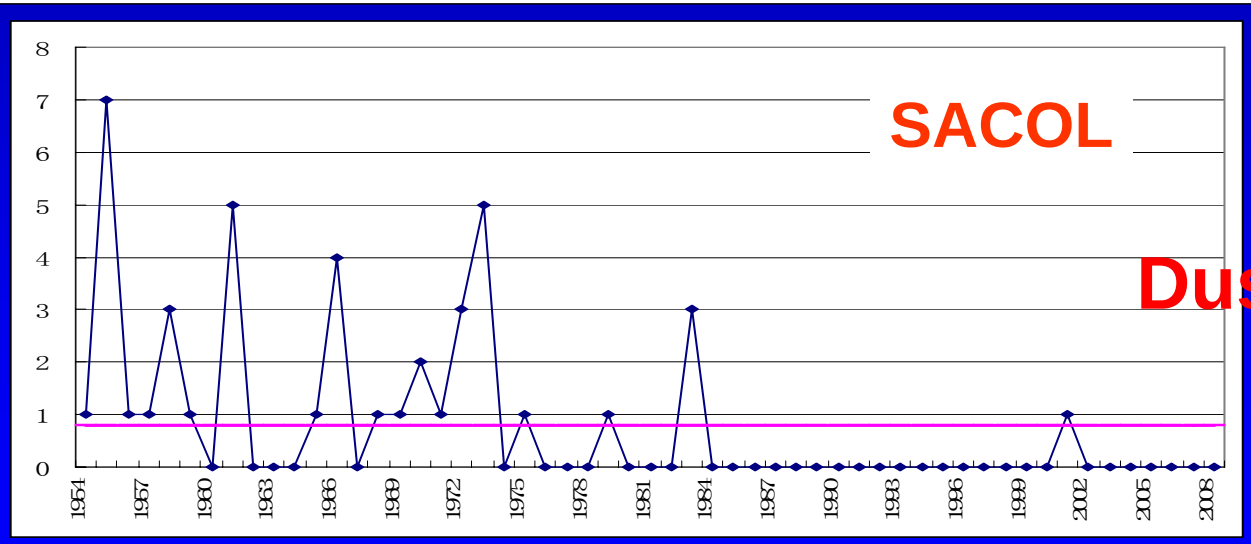



Though there is a down-trend of dust events in western China,…

Comparison of dust events at Jingtai, 2008 vs LTA






**Dust Events**

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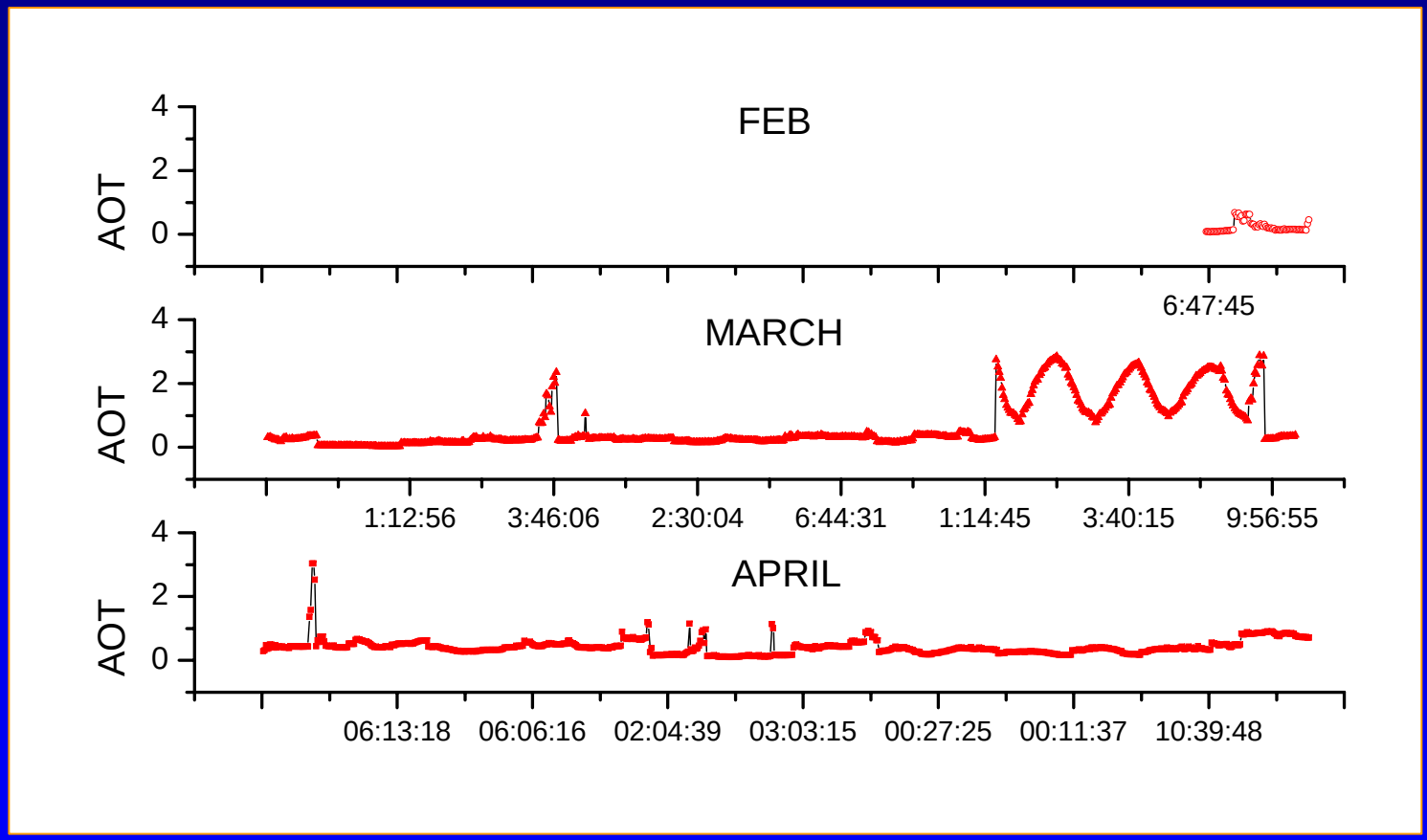
# Preliminary list of weather/dust events while in Zhangye, China

| No. | Date | Time0(UTC) | Event | Description |
|---|---|---|---|---|
| 1 | April 26th | | local dust | Visually, the dust appears to be lifted off the local surface soil as opposed to long range transport. Gusty winds up to 10m/s. |
| 2 | **May 2nd** | **10am** | **dust** | begins around 10am UTC (1800 local time) – initially the storm appeared be a weak event only lasting a brief time (30 minutes) but picked up again and raged in full force for a couple of hours. From a duration and visibility standpoint this was the strongest event recorded. |
| 3 | May 8th | | dust | |
| 4 | May 11th | | dust event (local high haze amounts) | |
| 5 | May 25th | | dust | |
| 6 | May 29th | | dust | |
| 7 | June 12th | | dust | |
| 8 | June 13th | | thunderstorm/dust | this event damaged equipment and was only sampled for half an hour before power was interrupted to the site |

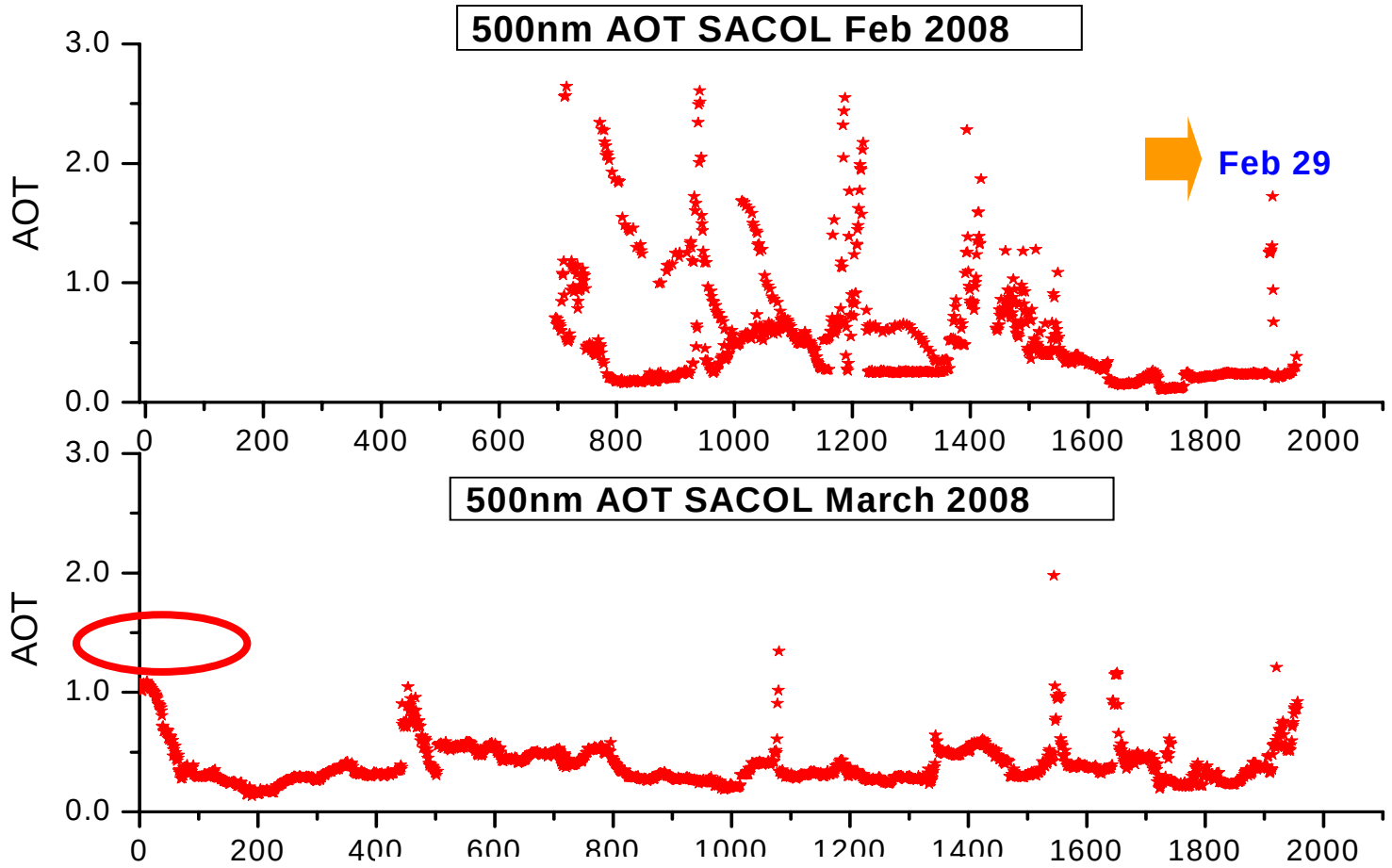
# AOT over Jiangtai site

From Feb 26 to May 31

AOT/AOD can only fulfil the daytime tasks...

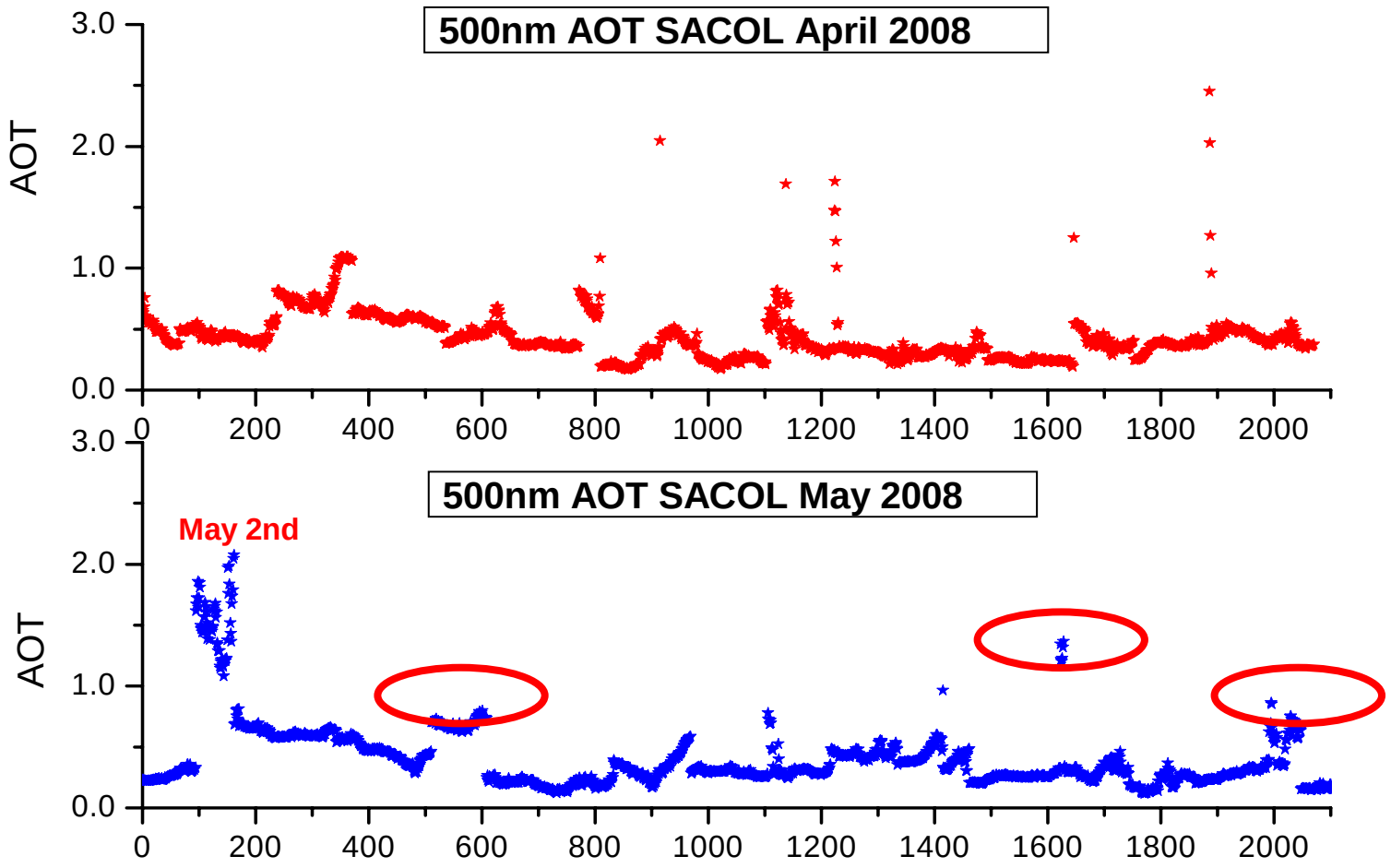


AOT/AOD can only fulfil the daytime tasks...



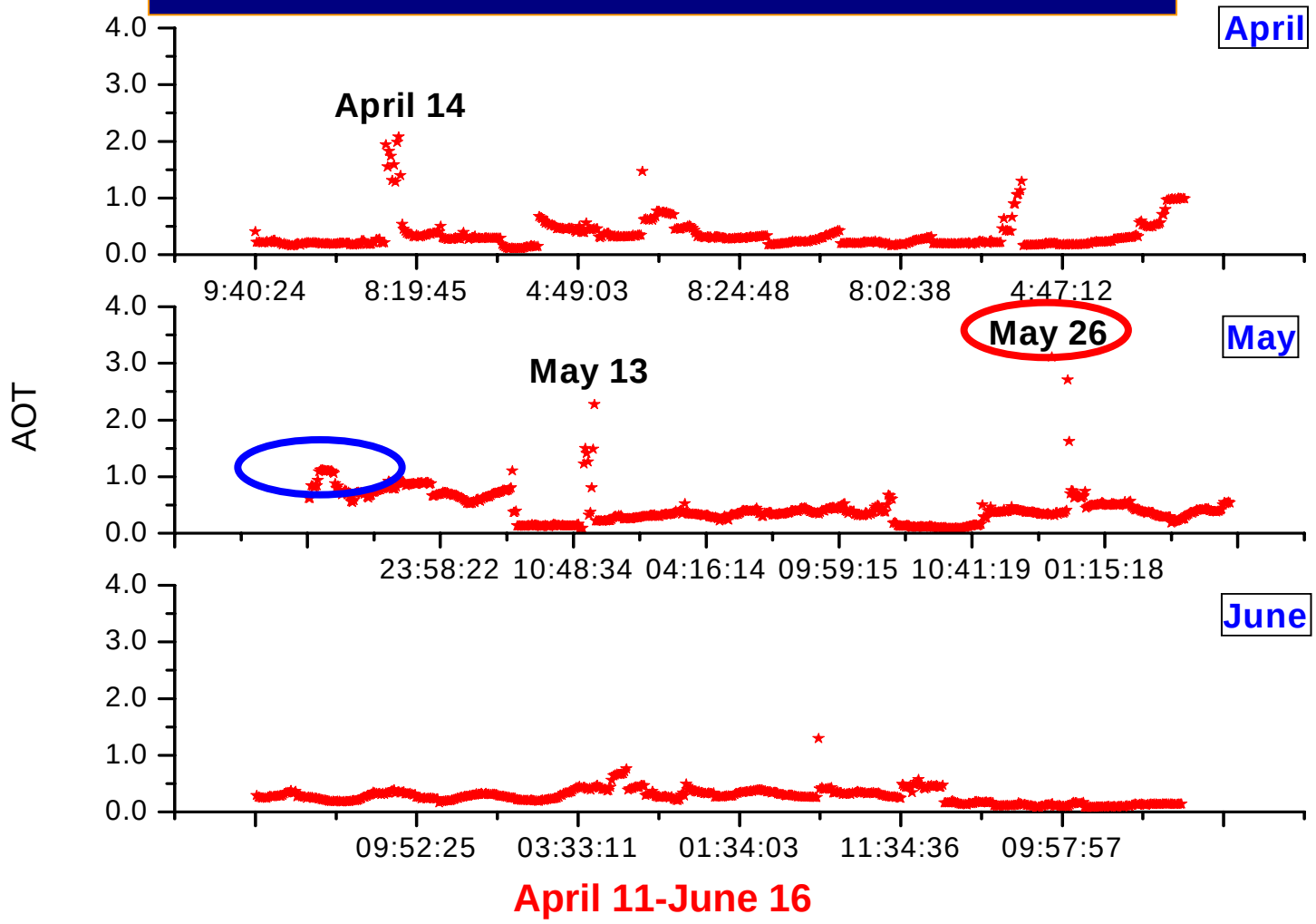

AOT in SACOL site

# AOT/AOD can only fulfil the daytime tasks...



# AOT in ZHANGYE site

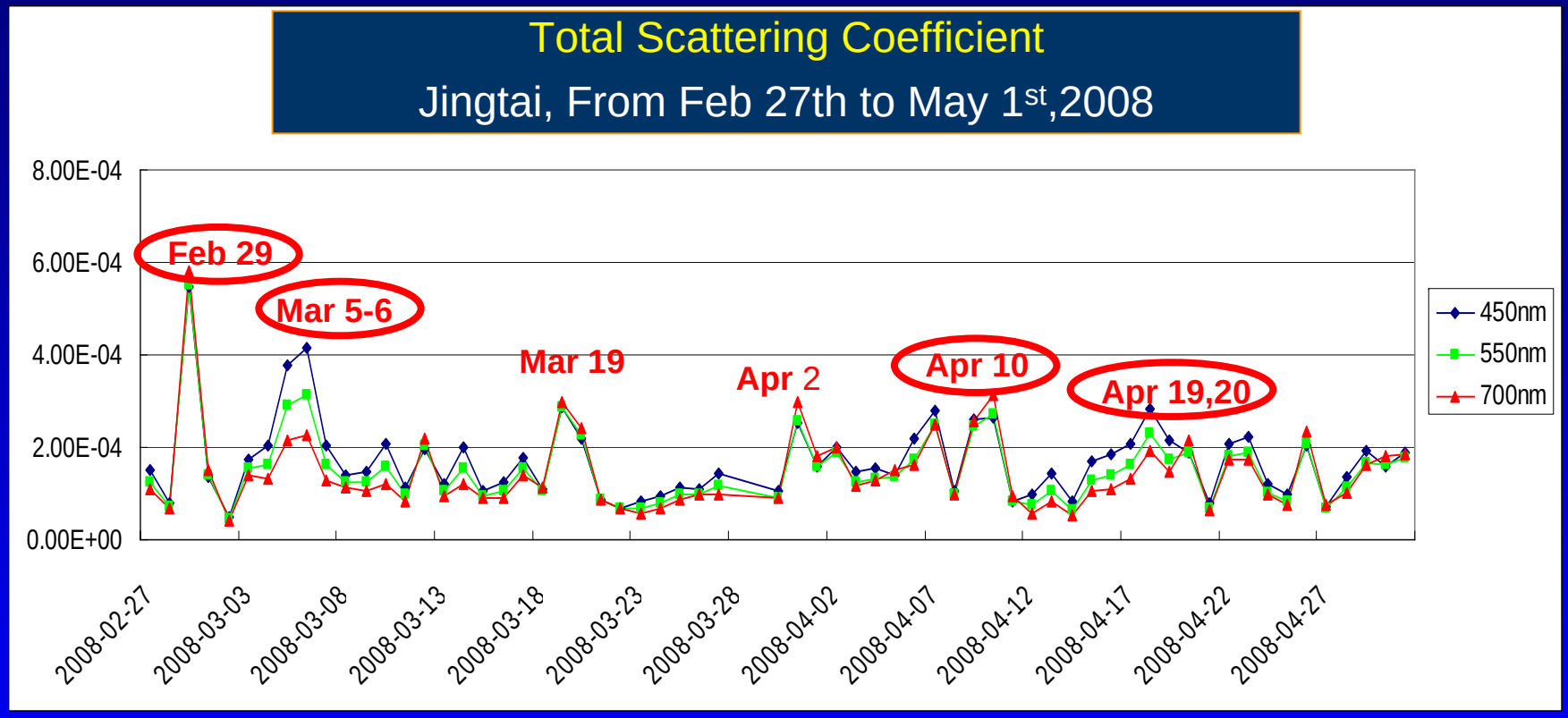
AOT/AOD can only fulfil the daytime tasks...




April 11-June 16

# Summary of Dust events in Jingtai, 2008

TSI Nephelometer 3563




There are many ‘peaks’ between the ‘Big’ events, according to the data measured by some round-the-clock instruments.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