Long term camera records of Asian dust events in eastern Asia during 2005-2008

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Observation stations:

Changchun 2003-; UB 2004-, Dalanzadgad 2004-2005, Kagoshima 2001-
Necessity of northern points of the ground observation arose from the satellite imagery of heavy dust events especially in 1998, 2000-2002 by Kagoshima group in collaboration with the simulation studies by RIAM group, Kyushu Univ., and communications in the AD-Net.

In 2003, Changchun observation by digital cameras started.

K. Kinoshita et al., Water, Air, & Soil Pollution: Focus 5 (2005), 89-100.

In 2004, three observation points in Mongolia added.

K. Kinoshita et al., IRS2004, Deepak Pub, pp. 319-322, 2006;

2005-, three-countries observation continuing.

Pick-up results are shown here.

This is a grass-roots cooperation among three countries!
Automatic long-term camera observation system

UPS = uninterrupted power supply

Digital camera records with one-hour interval
Video camera records with ten-minute interval
Monitoring camera and web server system since Dec. 2000, with 5 or 1 min. interval

Volc (to Sakurajima and Mayon in English):  http://arist.edu.kagoshima-u.ac.jp/volc/index-e.html

Booklet, “Volcanic Eruption Clouds in the Western Pacific - Ground and satellite based observations and analyses –”

Satellite Analysis of Asian Dust Events by Kagoshima Kōsa Analysis Group:
http://arist.edu.kagoshima-u.ac.jp/adust/kosa-e/kosa-e.htm

Booklet: Satellite Imagery of Asian Dust Events, Kagoshima Kōsa Analysis Group
Two cameras at the third floor

Institute of Meteorology and Hydrology

**Photo:**
Ricoh Caplio G4wide with 512 MB SD memory, 1 hr. (or 30 min.) interval during springtime (March – June).

**Video:**
Sony DCR-TRV900 and semi-fish eye lens with the cassette 120 min. in LP mode. 10 min. interval and 0.5 sec. recording during springtime (March – June)
Digital camera. Video camera and digital watch

Observation station in a building of Environmental Science Department

College of Urban and Environmental Sciences, Northeast Normal University

Photo:
Casio QV-R4 with 512 MB SD memory, 1 hr. interval during springtime (March – June).

Video:
SONY DCR-TRV40E, with miniDV cassette 120 min. in LP mode, 10 min. interval and 0.5 sec. recording during springtime (March – June)
Visibility near the horizon in Changchun

Fine 05.3.20, 12CST

Dusty 05.3.21, 11CST

Rainy 05.3.23, 11CST
RGB Analysis:
Vertical profile

400 lines
from the top
In 480 lines
RGB Analysis: Scatter plot

2005 Kosa Changchun RGB analysis

- Clear Sky
- Cloudy Sky
- Moderate dust
- Light Dust

Clear sky: 05/03 12CST
Cloudy sky: 05/05 12CST
Moderate dust: 04/06 15CST
Light dust: 04/30 12CST

Including light dust on April 30, 12CST
NOAA AVI image on 29 April, 17:32 CST

Changchun
17:00 CST
Album of Changchun Sky in 2006
Changchun: 25–28 March 2006 (7–19 CST)

3 hr. interval during
27–29 March 2006

By Digital camera
Ricoh Caplio G4 wide

3 hr. interval,
Mar. 12–May 15, 2006
AVI Images of MTSAT1R on 6–9 April 2006
Visible and NIR Views in Kagoshima, Apr. 7-9, 2006

Multi-directional temporal photos with
Visible and Near Infra-Red modes
SONY DSC-V3 (with IR84 filter)
since Nov. 2005

Landmarks
NIR photography

(a) Daylight mode

(b) NIR mode
Summary on dust events in Mar.-Apr. 2006
2007 Kagoshima, 3h. Interval

Ricoh Caplio G4wide, Horizontal 65°
2007.3.28-31  3.28 Dust over Kyushu-Tohoku
AVI images of MT-Sat VISSR 2007.3.30/31 every 1 hr. 00-07/08-15/16-23 JST
Album of Changchun sky in 2007
AVI images of MT-Sat VISSR 2007.4.1/2 every 1 hr. 00-07/08-15/16-23 JST
Dust over Okinawa- Tohoku on 1-2 April
Sakurajima 2007. 4. 1–5

4.1.
4.2 dusty

Kagoshima 2007 April 2, Visible and NIR
Ulaanbaatar, Spring 2008

Short time dust on 17 April

(Anomaly at 17h due to halation)
Changchun light dust on 1-2 March 2008

1st dust in Japan over Okinawa-Tohoku on 3 Mar.,
Followed by dispersing dust on 4 March.
Kagoshima: visibility decreased to 5 km on 3 Mar.
Interval recording method by photo and video cameras, in conjunction with satellite imagery and other related data, is confirmed to be useful.

RGB analysis applied to interval records is effective to study the turbidity of the air.

The results may be utilized for the studies of not only dusty air but also many other aspects of weather changes and air quality studies.

Aerosol Vapor Index images of MTSAT1R are helpful in detecting Asian dust, as of NOAA/AVHRR.

The results are shown in http://arist.edu.kagoshima-u.ac.jp/adust/kosa-e/kosa-e.htm
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