

NIES



Ground Observation of Aerosol in North East Asia

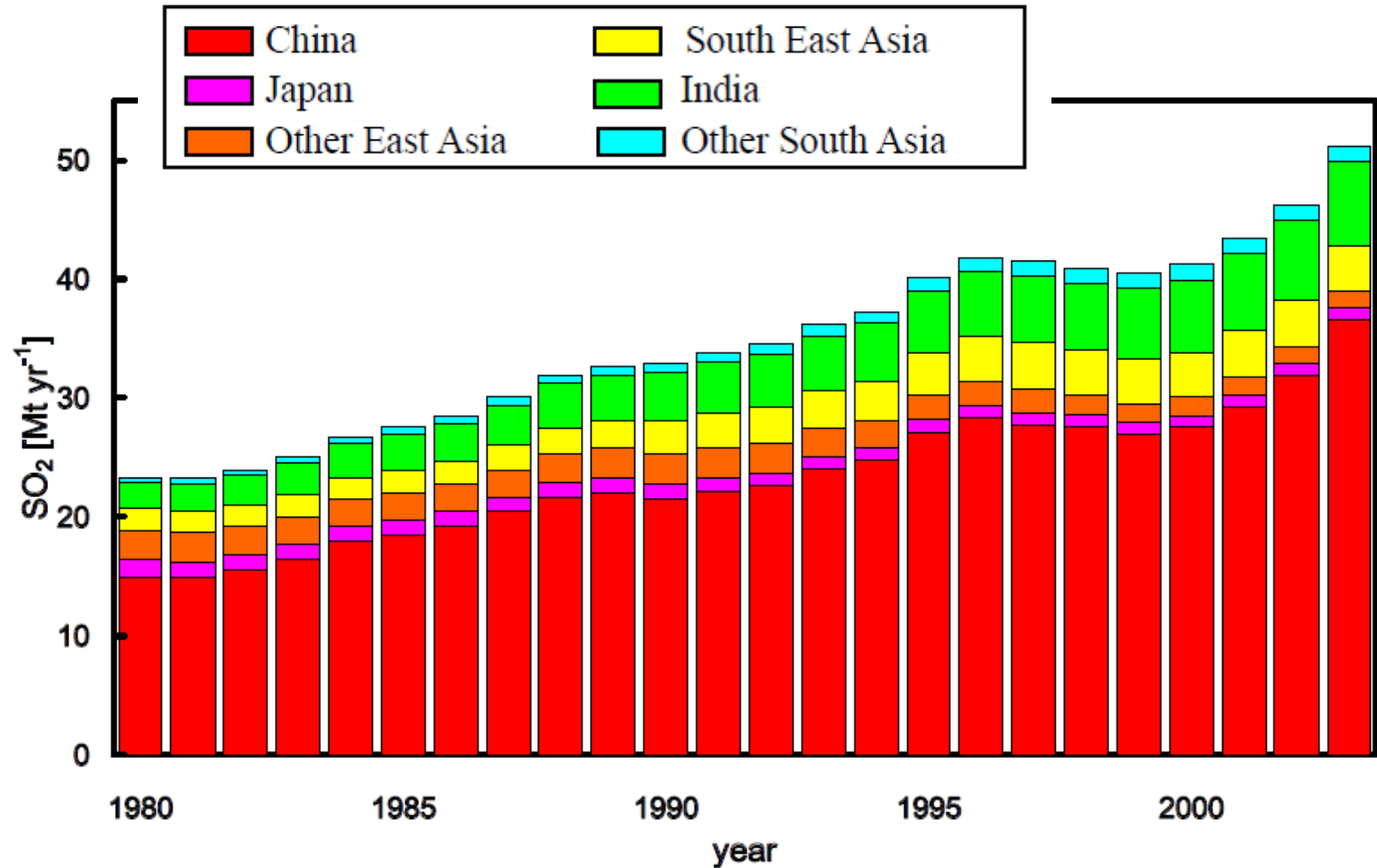
Akinori Takami

National Institute for Environmental Studies
Tsukuba, Japan

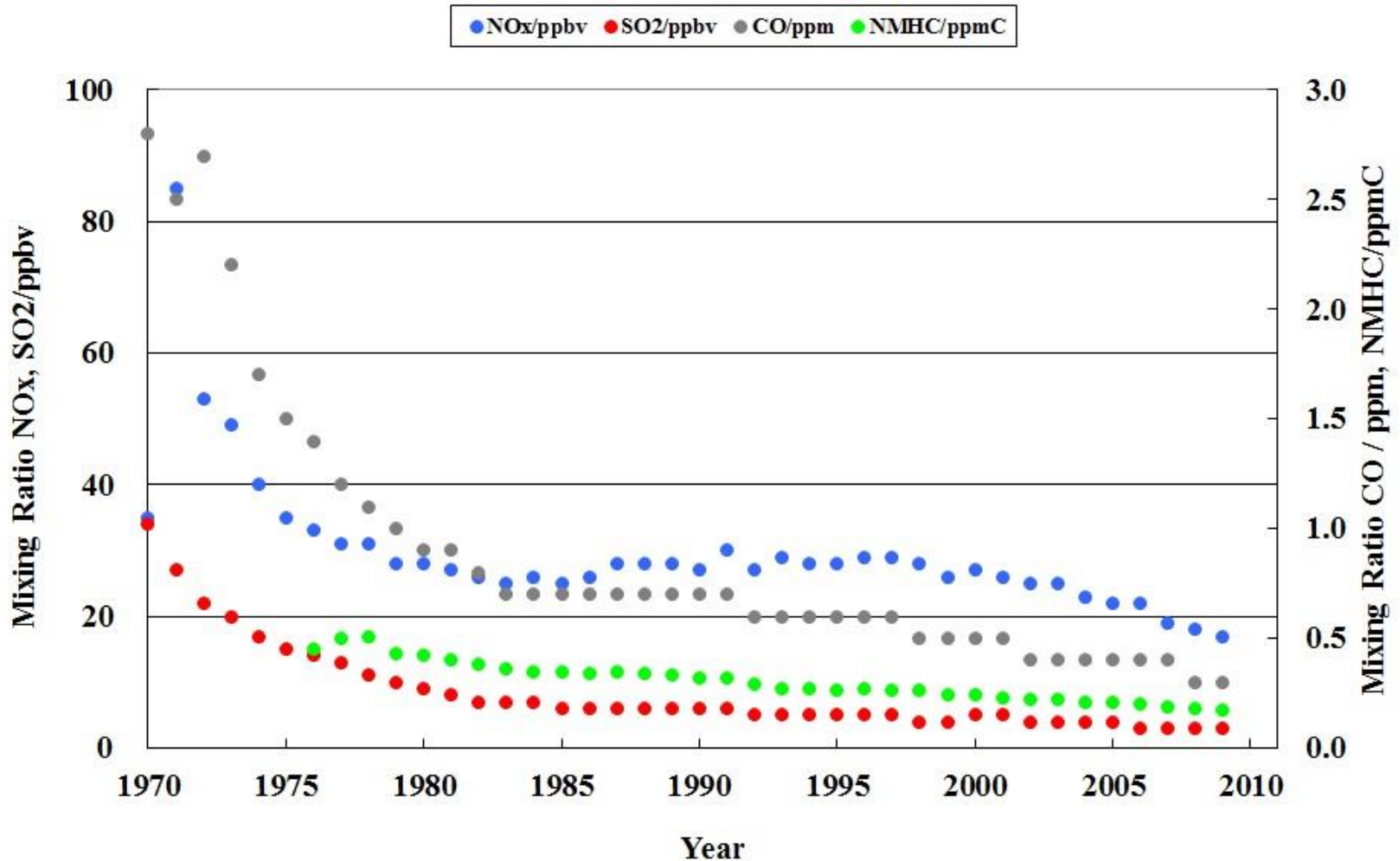
**International Workshop on “Inventory, Modeling and Climate Impacts of
Greenhouse Gas emissions (GHG’s) and Aerosols in the Asian Region”**

June 26-28, 2013; Tsukuba International Conference Center, Japan

Increase of Emission

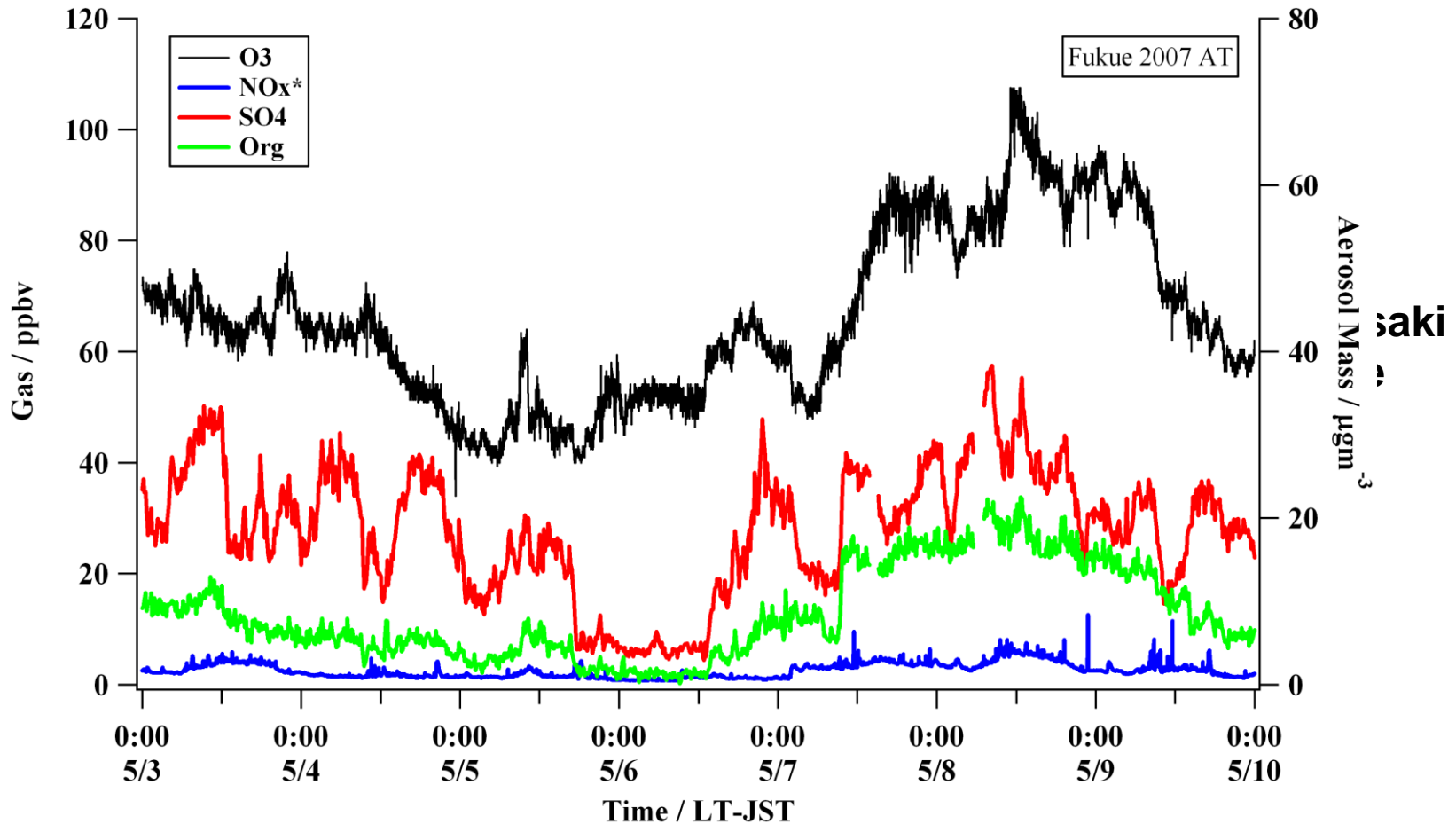


Decrease of Air Pollutants in Japan



Data from MoE

High concentration of O3 and PM



- Decrease of Air pollution in Japan for over 40 years
- Recent increase of Air pollution in Kyushu is a large issue in Japan.
- Necessary to observe air quality in the East Asian region.

Net Work for the Ground Observation in North East Asia

- National Monitoring Net Work
Japan, Korea, China
- EANET
- AMS Monitoring Net Work

National Monitoring Network in Japan

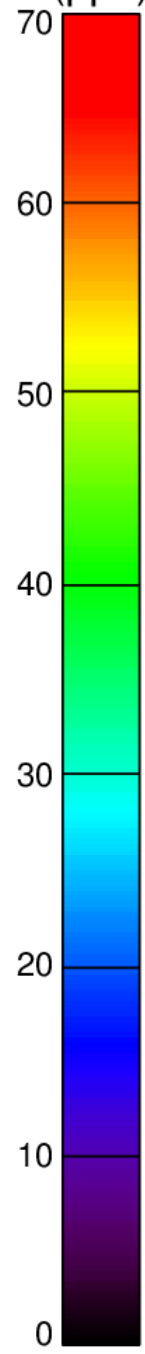
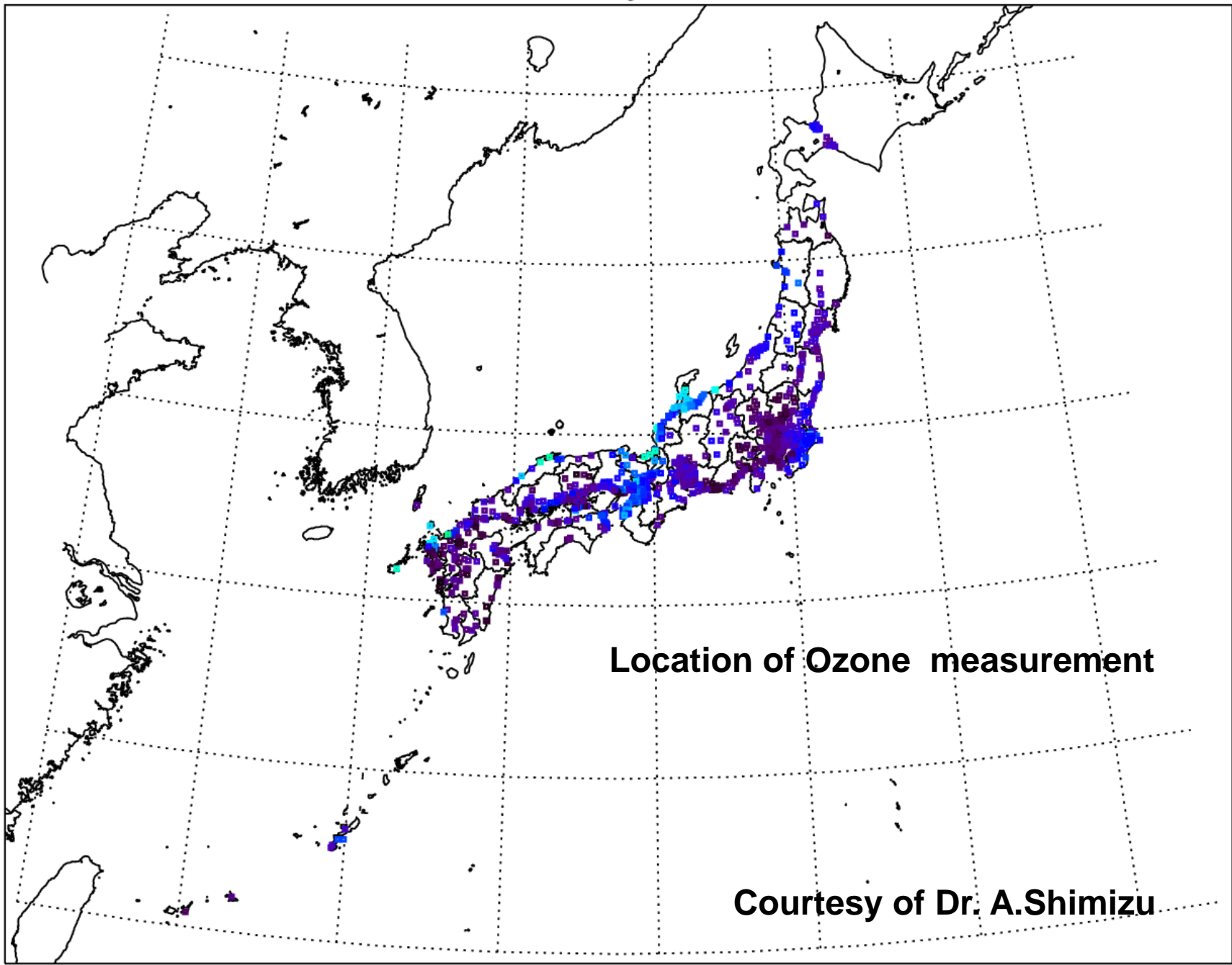
- Soramame
- <http://soramame.taiki.go.jp/Index.php>
- Ozone more than 1000 sites
- PM2.5 more than 500 sites

N = 1072

O₃

20130613/08

(ppb)



Location of Ozone measurement

Courtesy of Dr. A. Shimizu

N = 569

PM_{2.5}

20130613/08

($\mu\text{g}/\text{m}^3$)

70

60

50

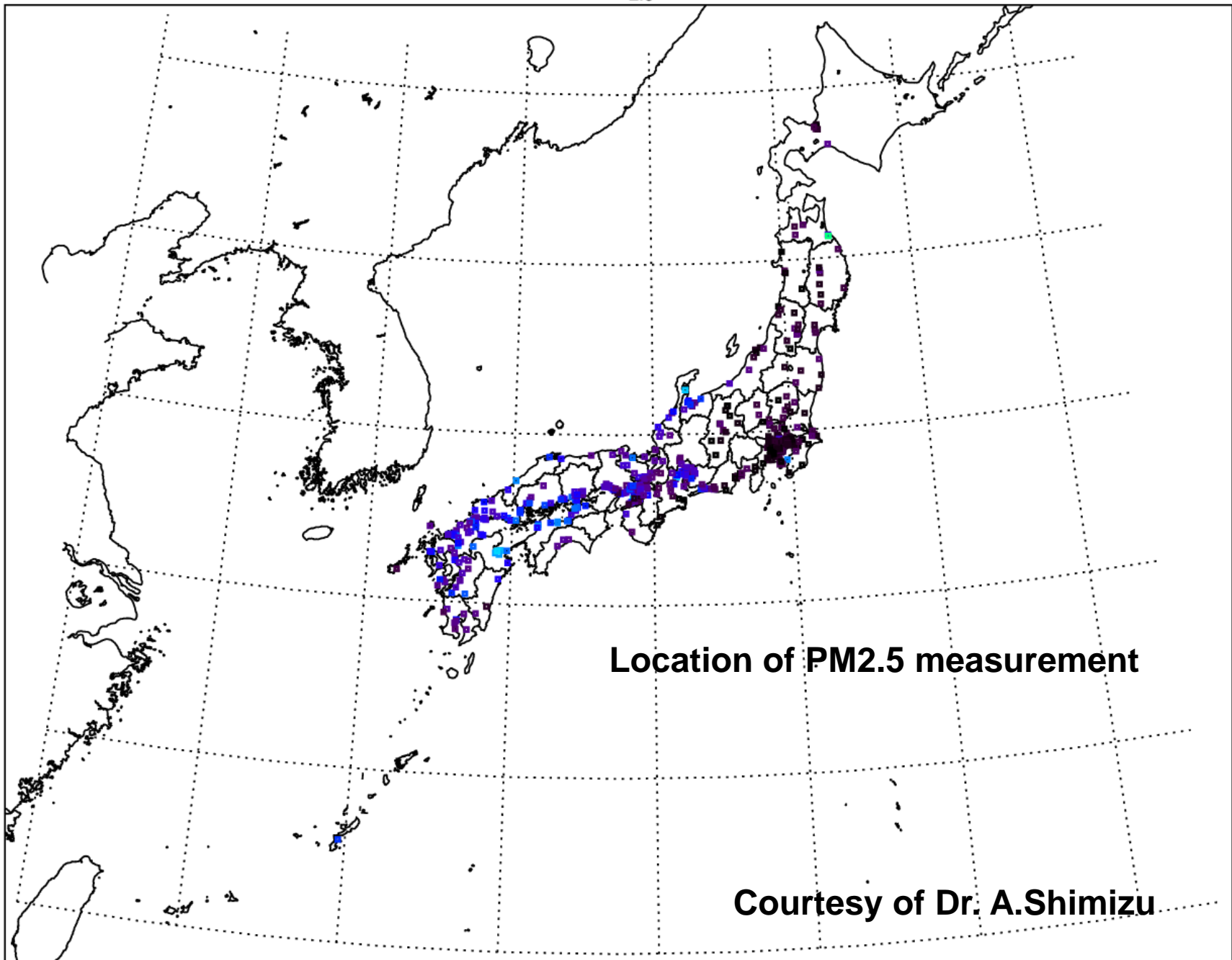
40

30

20

10

0



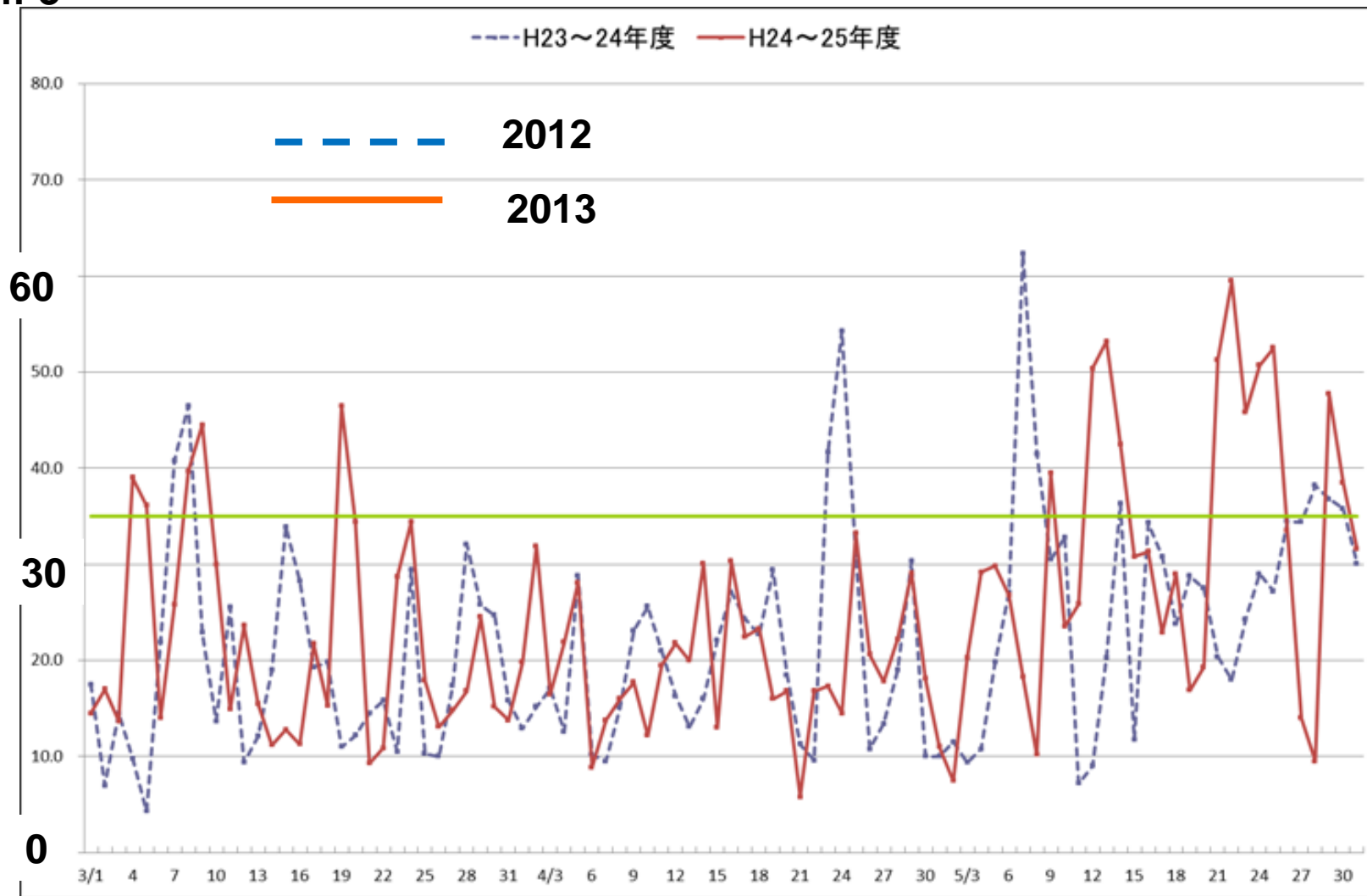
Location of PM2.5 measurement

Courtesy of Dr. A. Shimizu

Mass
 $\mu\text{g}\cdot\text{m}^{-3}$

PM2.5 at Fukuoka City (Kashii)

From MoE J HP



3/1

4/3

5/3

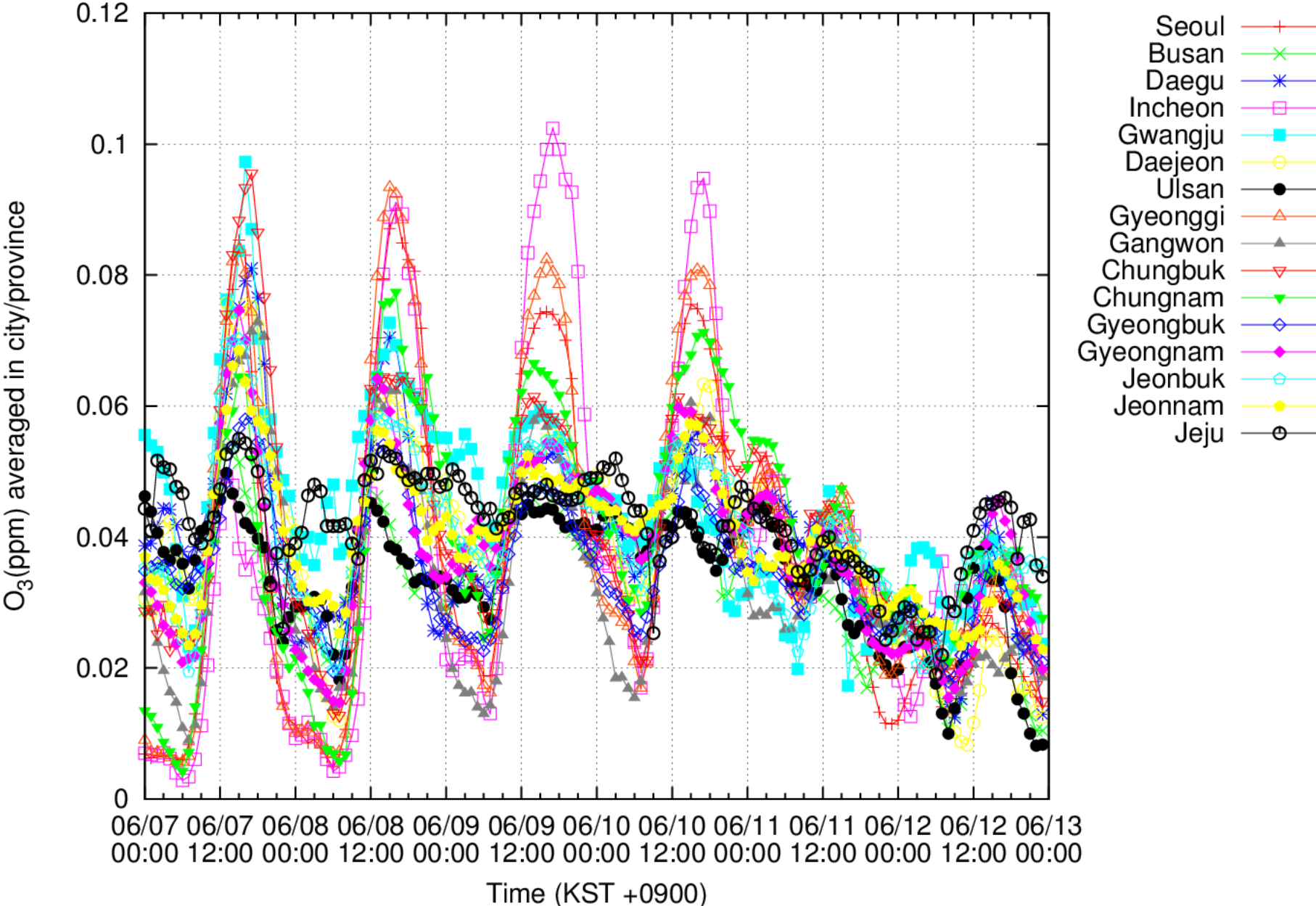
10

date

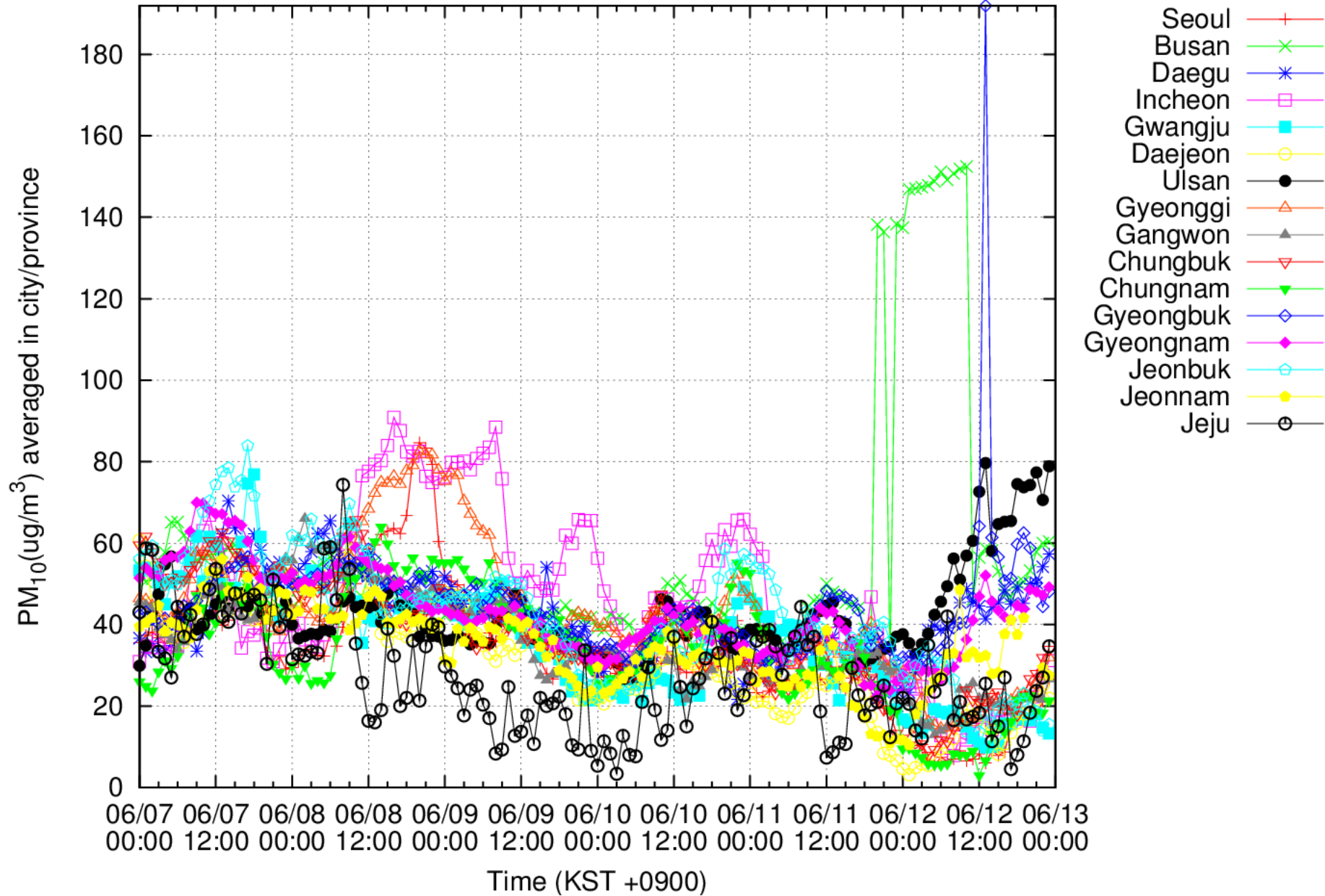
AirKorea

- <http://www.airkorea.or.kr/airkorea/eng/realtime/main.jsp>
- Ozone
- Only PM10 (not PM2.5)
- 255site on 2013.6.12

AirKorea (<http://www.airkorea.or.kr/airkorea/eng/>)



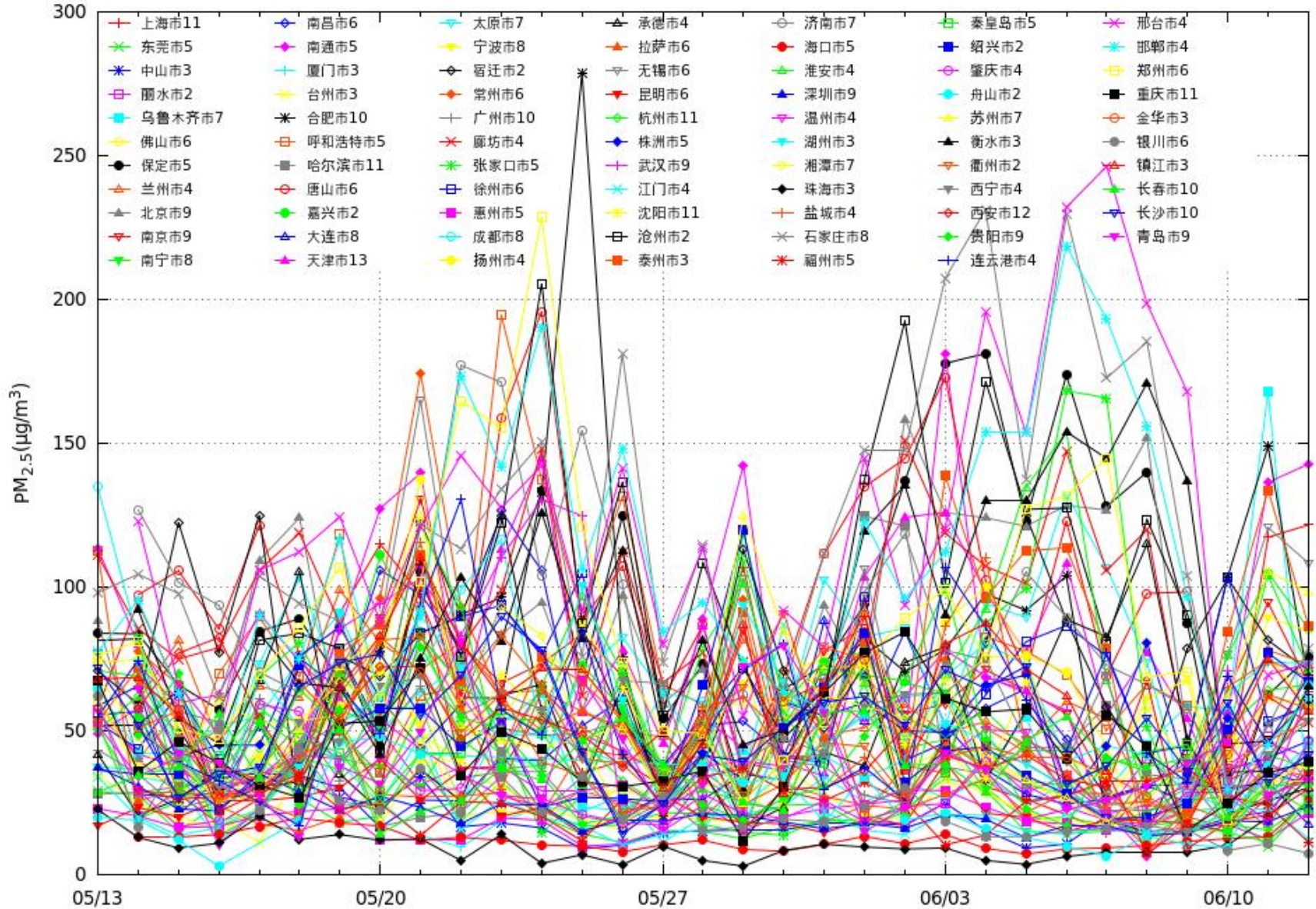
AirKorea (<http://www.airkorea.or.kr/airkorea/eng/>)



China

- MEP
<http://113.108.142.147:20035/emcpublish>
(not available now)
- Available at
www.pm2d5.com
- 76cities 474sites on 2013.6.12

市内平均



EANET

Monitoring Network



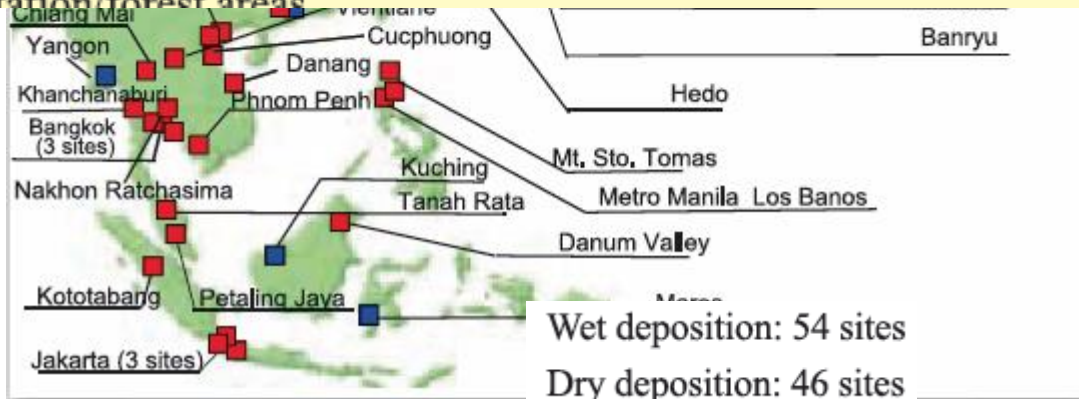
1. Wet deposition/rainwater

- ◆ Interval: every 24 hours or every precipitation event for the urban, rural and remote sites
- ◆ Major parameters: pH, electric conductivity (EC), concentrations of sulfate (SO_4^{2-}), nitrate (NO_3^-), ammonium (NH_4^+), etc.

2. Dry deposition/air concentration

- ◆ Interval: every day to 2 weeks or every hour when measured by automatic instruments
- ◆ Major parameters: Sulfur dioxides (SO_2), nitrogen dioxides (NO_2), ozone (O_3), etc. Mass and components concentration (such as sulfate) of particulate matter (PM)

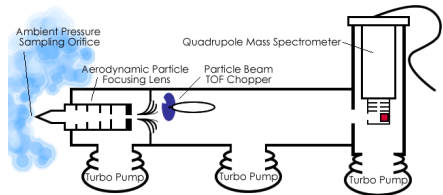
3. Soil and vegetation/forest areas



From EANET Brochure

AMS Monitoring Net Work In North East Asia

- NAATS possibly in winter 2013



Beijing



Baeong-Yeong Island



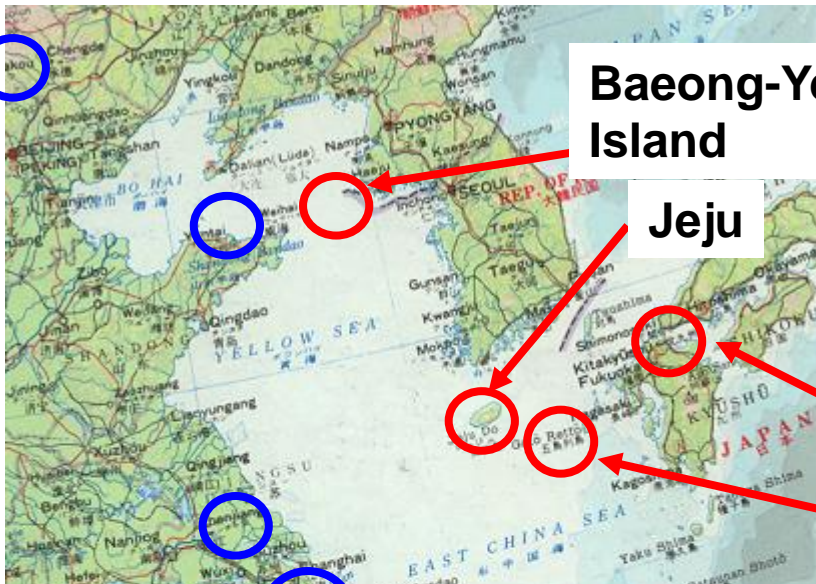
Jeju



Aerodyne AMS
Long term monitoring



Campaign



Fukuoka

Fukue

Shanghai Area

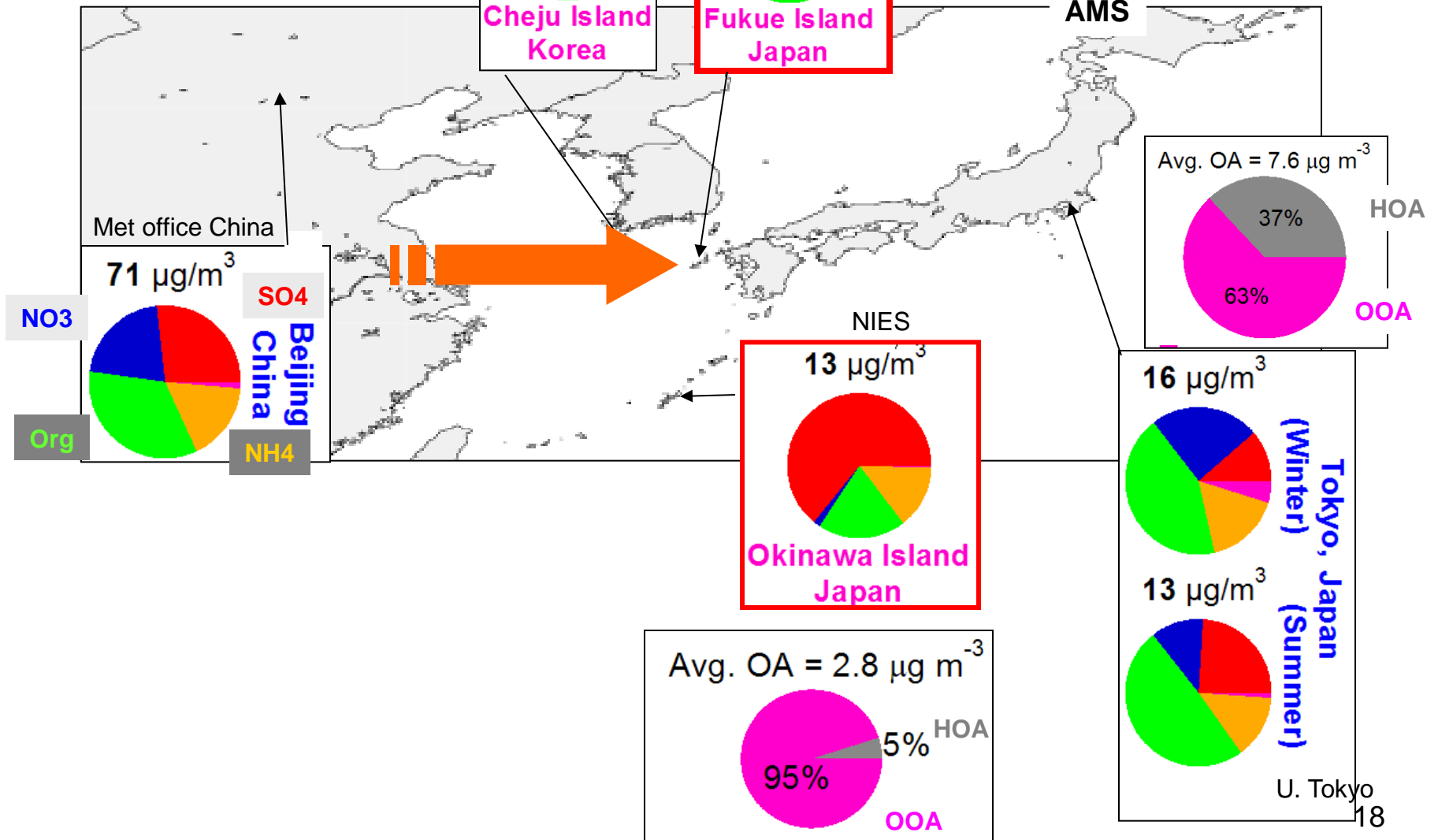
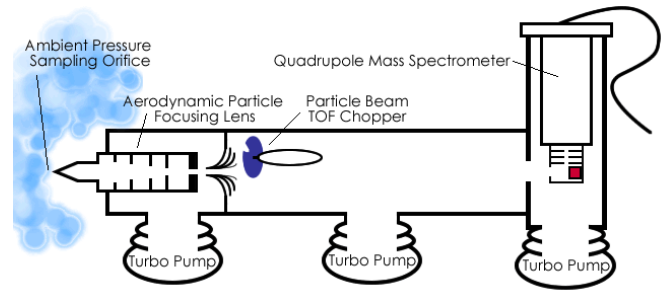
Okinawa

Collaborative work among the Aerodyne AMS users in China, Korea and Japan. Simultaneous measurements are now being planned.

Shenzhen Area



Example of Previous AMS measurements



Long term monitoring in NIES

Cape Hedo, Okinawa Since 2004
Fukue, Nagasaki, since 2008
West part of Japan, Center of East Asia

Many institutes joins.
ABC net work super site

Measurement Item

Chemical composition	Physical/Optical
AMS/ACSM (SO ₄ , NH ₄ , Organics) Carbon monitor (EC, OC, TC) Total nitrate (NO _y) NO ₃ Hg monitor Organic, Metal, PAH分析 Filter sampling VOC measurements	Lidar TEOM BC monitor Aethalometer MAAP, COSMOS Nephelometer MAX-DOAS

Skyradiometer, Solar radiation, Cloud camera

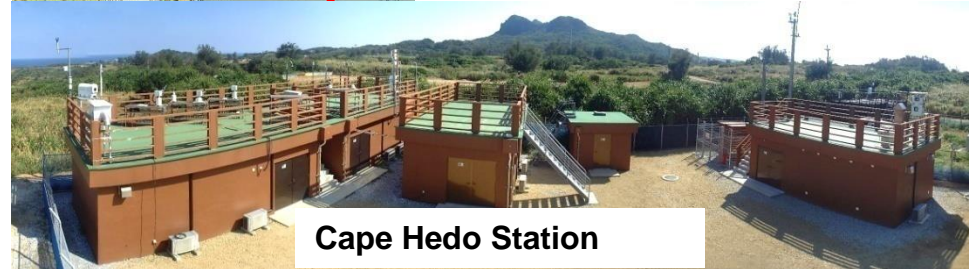
Gas ozone, NO_x, SO₂ and CO

Period of measurement;
Fall- Winter- Spring, Oct – May, June

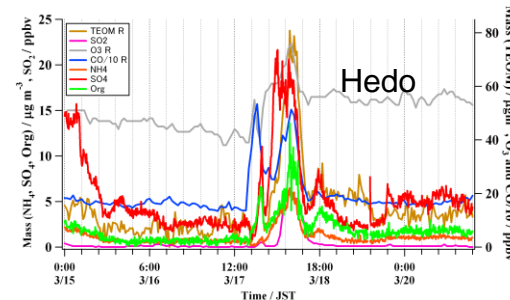
Fukue site



AMS



Cape Hedo Station



Lidar

HP of CHAAMS, Okinawa

 National Institute for Environmental Studies

Cape Hedo Aerosol and Atmosphere Monitoring Station (CHAAMS)



National Institute for Environmental Studies,
“Cape Hedo Atmosphere and Aerosol Monitoring Station (CHAAMS)” Website.

CONTENTS

[Outline](#)

[Photography](#)

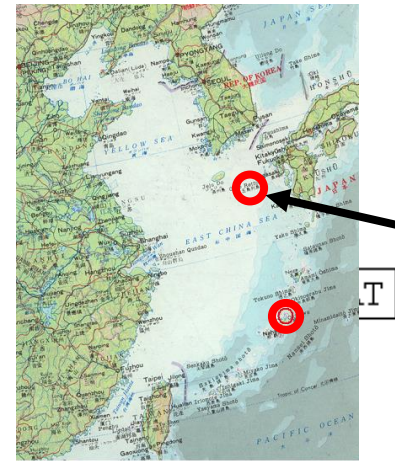
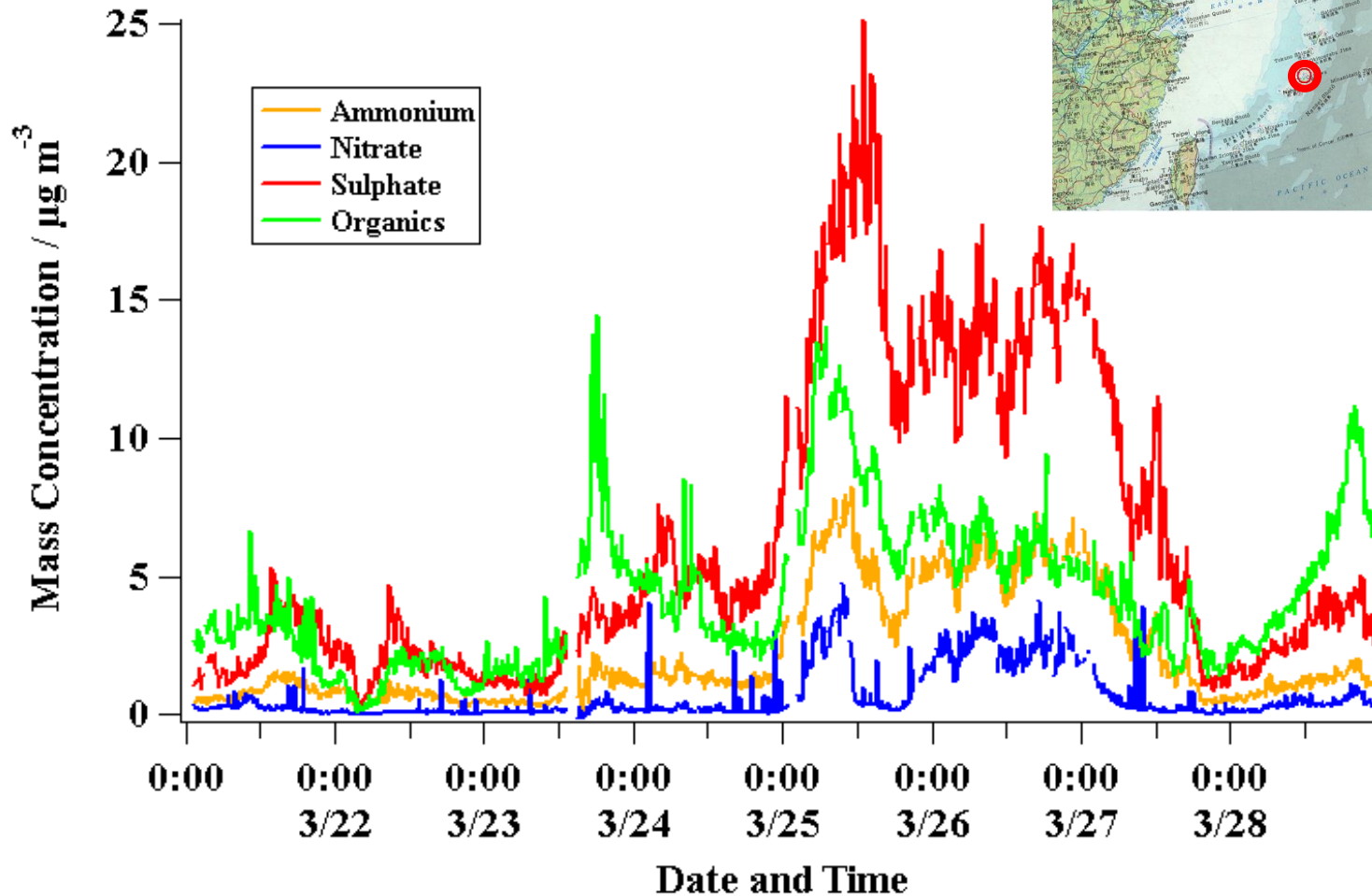
[List of Instruments and Data](#)

[>> Japanese](#)

<http://www.nies.go.jp/asia/hedomisaki/home-e.html>

Fukue AMS measurements

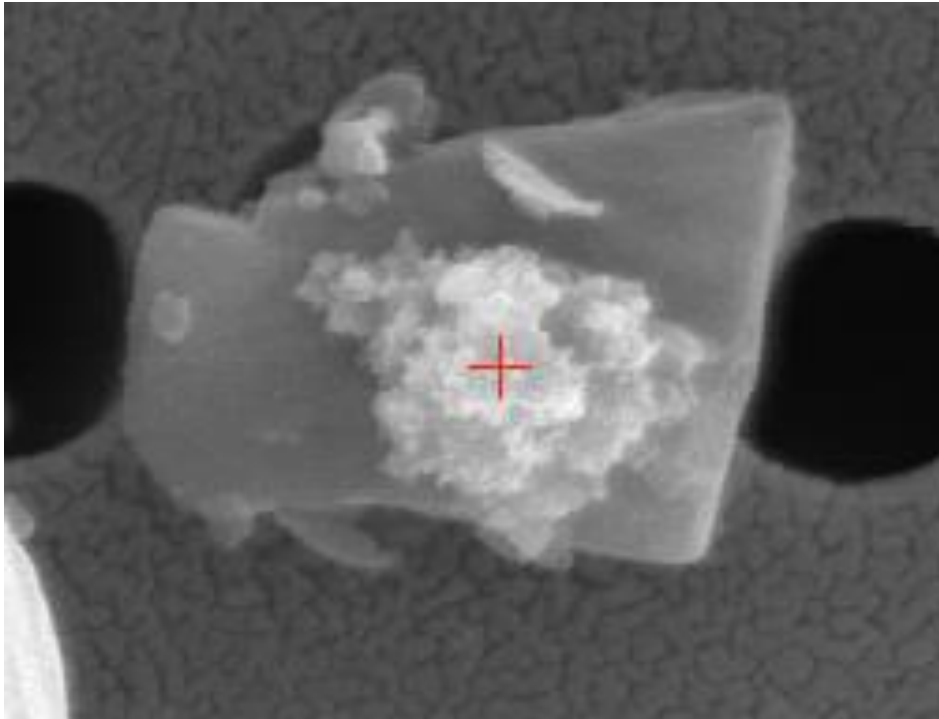
Fukue APEX Period 2003



Fukue

Electron microscopic image

The mixture state is complicated.



Summary

- Several networks in Japan, Korea, China, EANET and AMS
- Measurement results in Nagasaki, Okinawa using AMS

Thanks for collaboration with

Profs. Hatakeyama,

Drs. Kaneyasu, Sato, Shimizu, Irei, Miyoshi, Yoshino

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