



New BSRN sites in Southeast Asia: from high elevation (**3845 m**) to sea-level

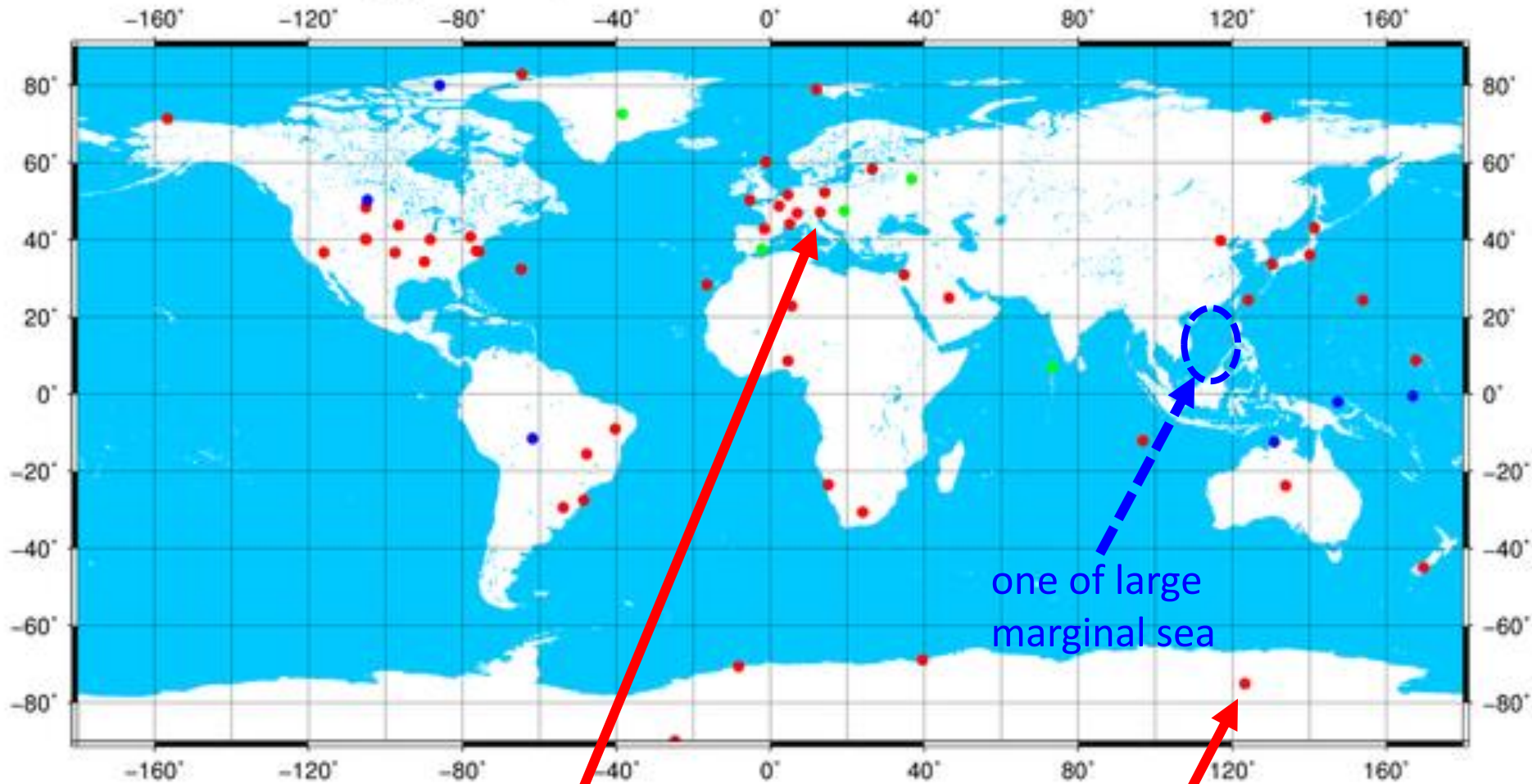
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&

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²Central Weather Bureau, Taiwan

Running, planned, and closed BSRN Stations, March 2015



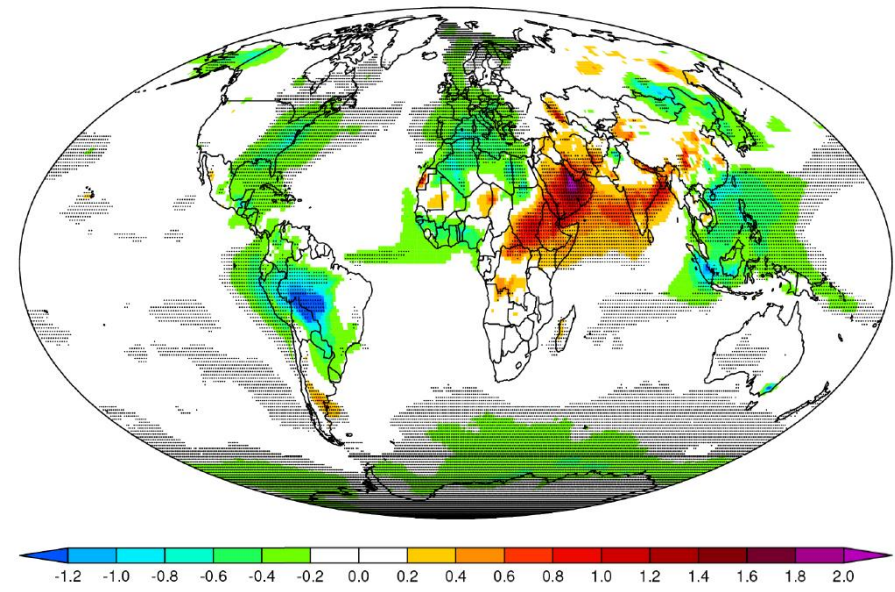
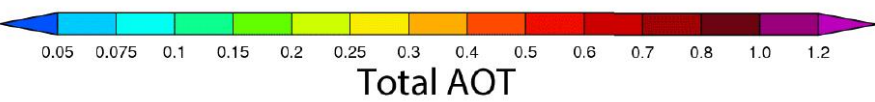
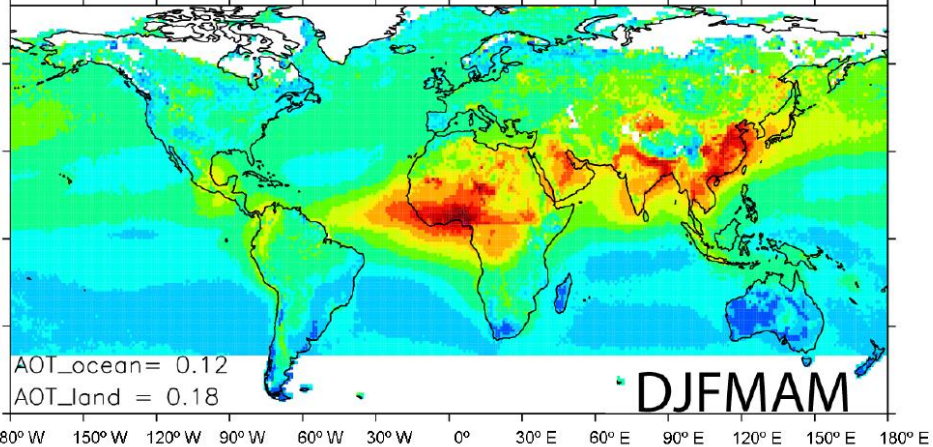
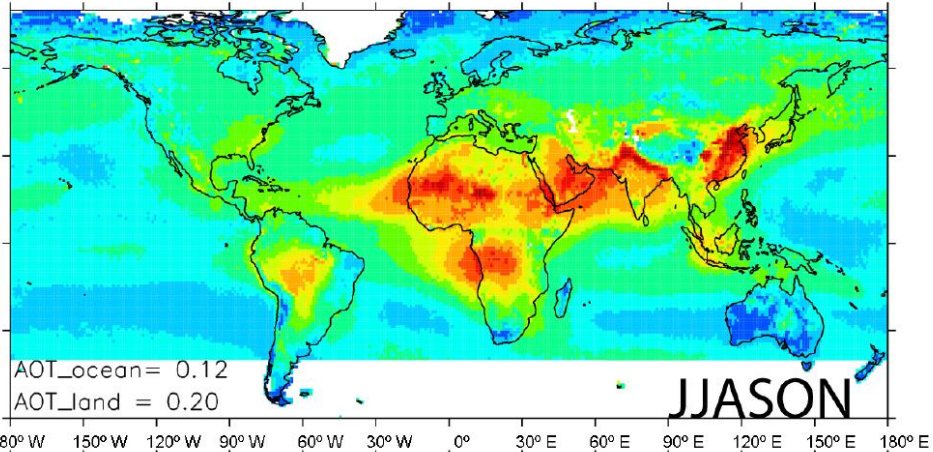
one of large marginal sea

Second highest station: Sonnblick, Austria (3109m)

Highest station: Concordia Station, Dome C, Antarctica (3233m)

- Running Stations
- Planned Stations
- Closed Stations

Global aerosol climatology

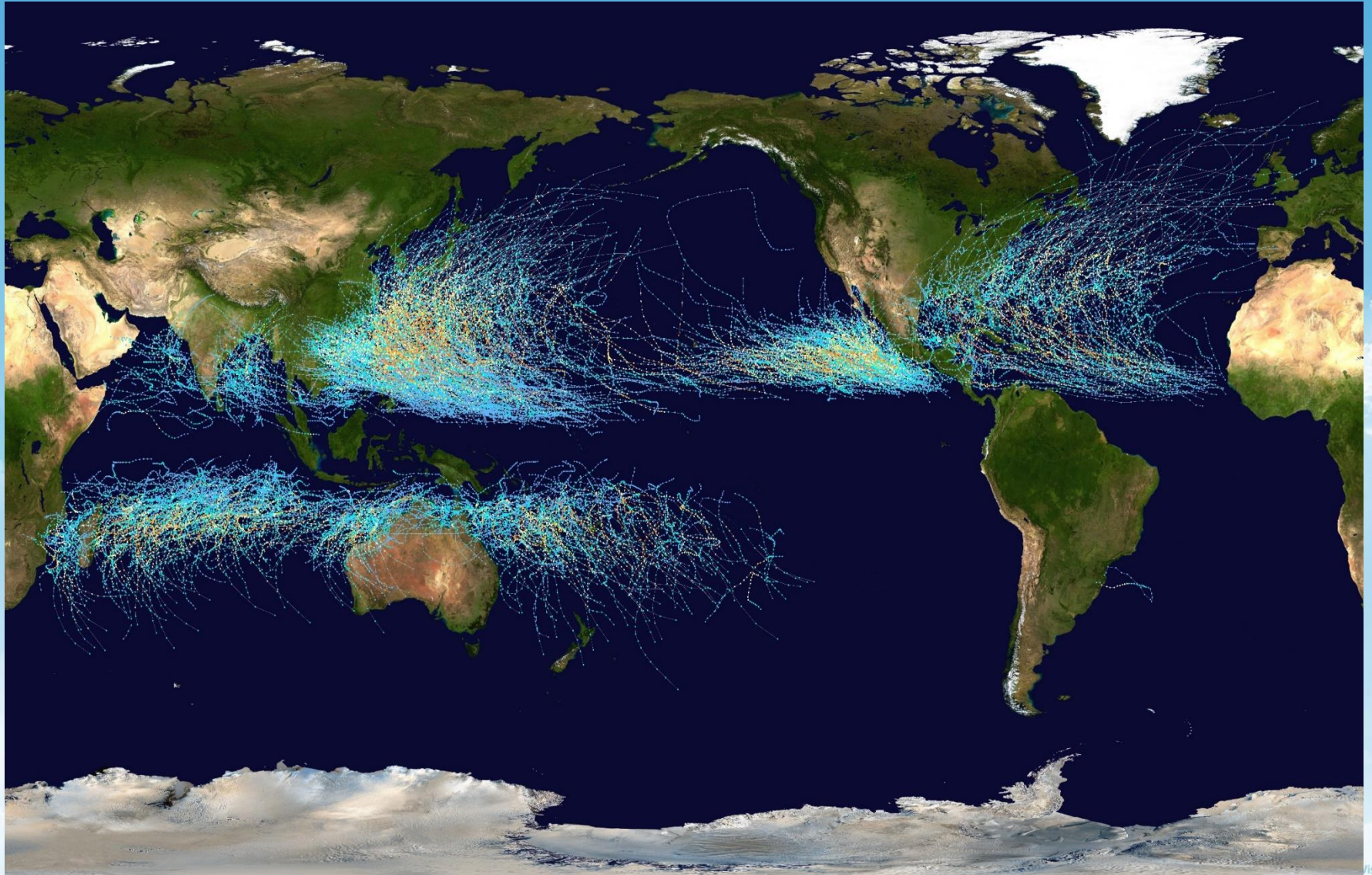


Trends of the deseasonalized reanalysis total AOT_{550 nm} over 2003–2013 (unit: 100AOT x year⁻¹).

Lynch et al (2016) GMD

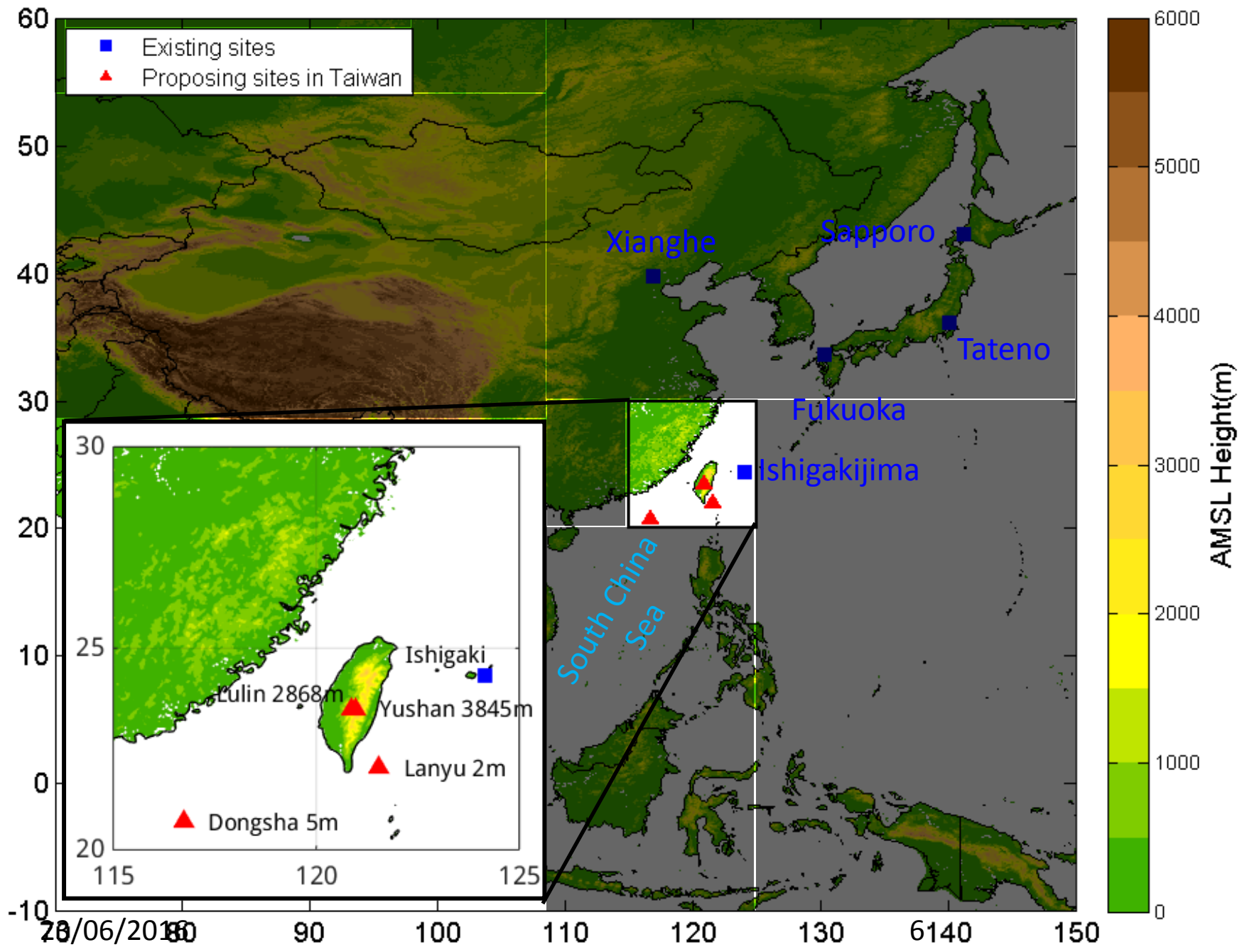
Seasonal mean of the total AOT at 550 nm

Historical Typhoon Tracks

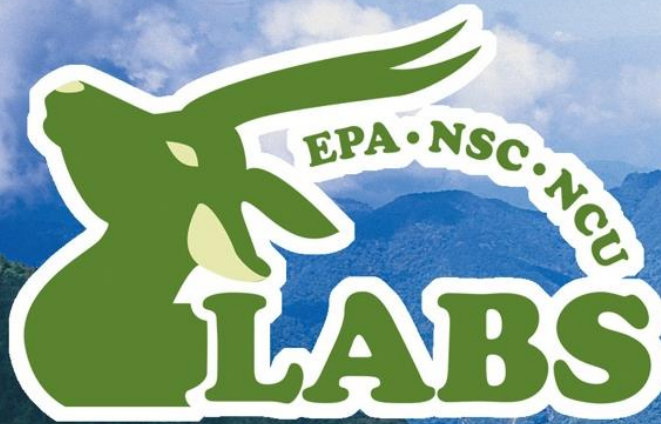


New BSRN Sites Proposal

- 1. Lulin Atmospheric Background Station
(2862 m)**
- 2. Yushan Meteorology Station (3845 m)**
- 3. Lanyu Meteorology Station (324 m)**
- 4. Dongsha Maritime Background Station
(5 m)**



20/06/2018



Since 2006



National Atmospheric Deposition Program

Lulin Atmospheric Background Station (2862 m)



NCU Astronomy Observatory

OPERATING UNDER WMO-GAW/NOAA PROTOCOLS



23/06/2016

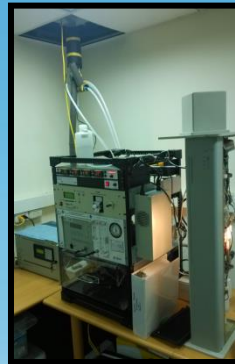
	Instrument, Manufacturer, Model
Aerosols	
Particle mass concentration	TEOM Particulate mass monitor, R&P, 1400
aerosol chemical components	Aerosol sampling, R&P, 3500
	Aerosol sampling, R&P, 2025D
Radiation	
7 spectral channels	Sunphotoneter, Cimel, CE-318
6 spectral channels	Shadow band, Yankee, MFR-7
UVA	UVA, Solar Light, MODEL 501
UVB	UV-Biometer, Solar Light,
Total flux	Solar radiaton sensor, MetOne, 96-1
Gases	
O ₃	Ozone analyzer, Ecotech, ML9810B
CO	CO monitor, TraceAnalytical, TA-3000R
CO	CO monitor, Horiba, APMA-360
CO ₂	CO ₂ analyzer, LI-COR, LI-7000
CFCs	Gas Chromatography, Agilent, HP6890N
Mercury	
Gaseous Elemental Mercury	Cold Vapor Atomic Fluorescence Sepctrometry, Tekran,
Reactive Gaseous Mercury	Mercury Speciation Unit, Tekran, 1130
Particulate Mercury	Particulate Mercury Unit, Tekran, 1135
Precipitation chemistry	
Rainwater sample	Rain sampler
Weather	
Visibility	Present Weather Detector, VAISALA, PWD22
Meteorological Monitoring System (Temp., Humidity, Press., Rain, Wind)	MetOne

23/06/2016

Aerosol & radiation Instruments

Timeline

Aerosol *in-situ*



NOAA aerosol system
Aerosol absorption (PSAP, CLAP, AE31)
Aerosol scattering (TSI Nephelometer)
Aerosol number (TSI CPC)



2006

2007

2008

2009

2010

2011

2012

2013

2014

Radiation



Cimel, MFRSR, and UV



Radiometers



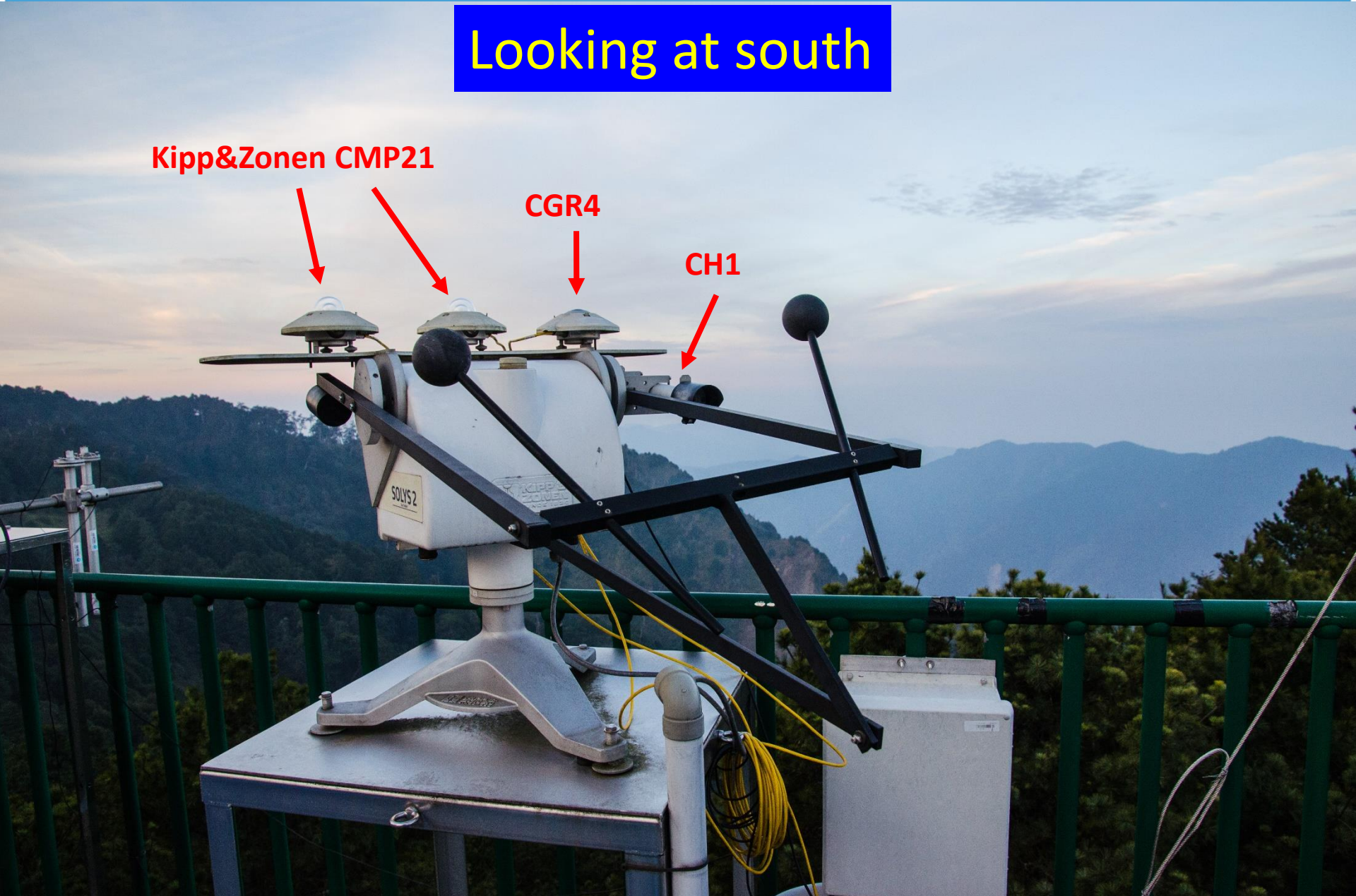
All-sky imager

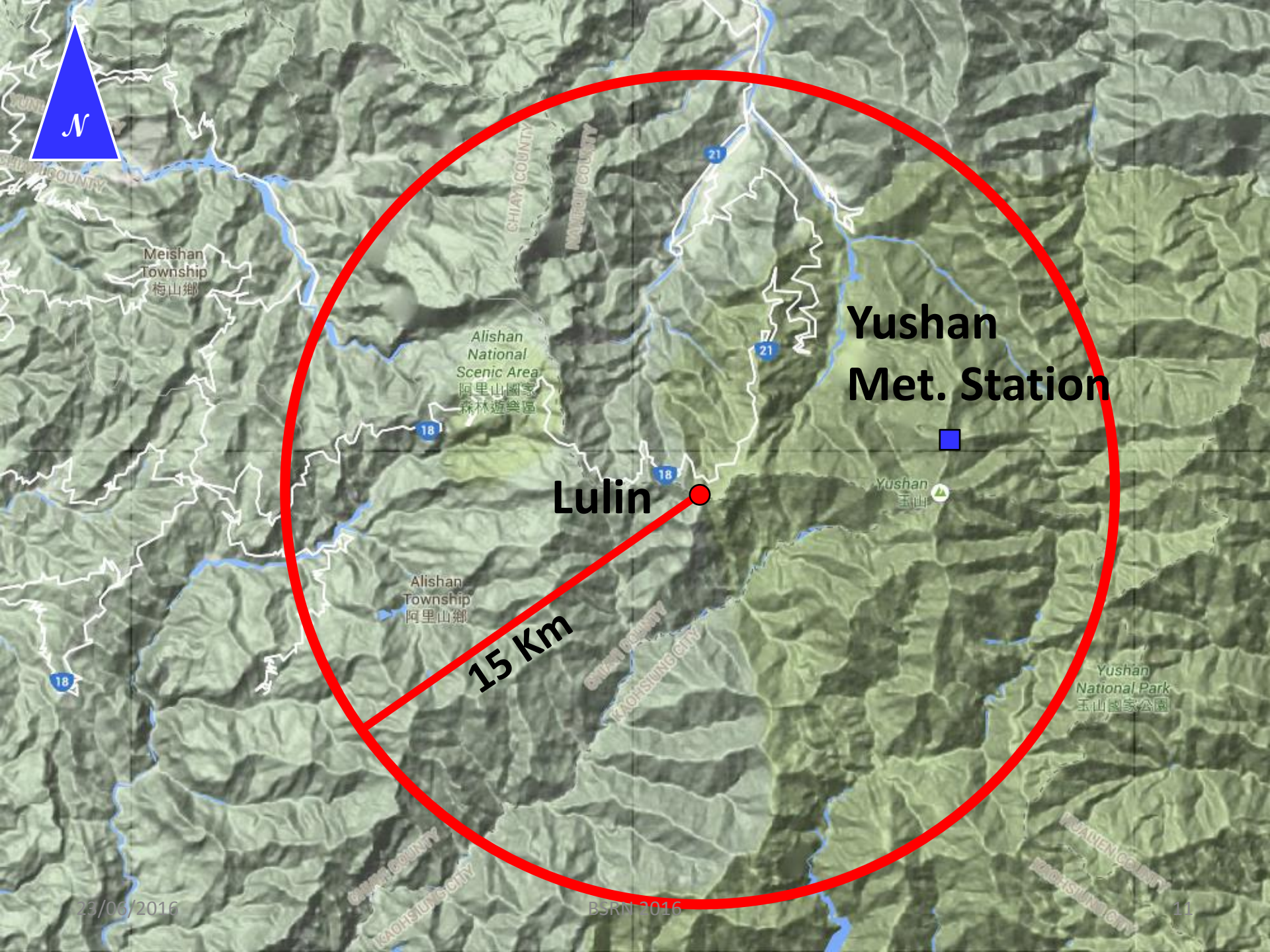
Looking at south

Kipp&Zonen CMP21

CGR4

CH1





Meishan Township
梅山鄉

Alishan National Scenic Area
阿里山國家森林遊樂區

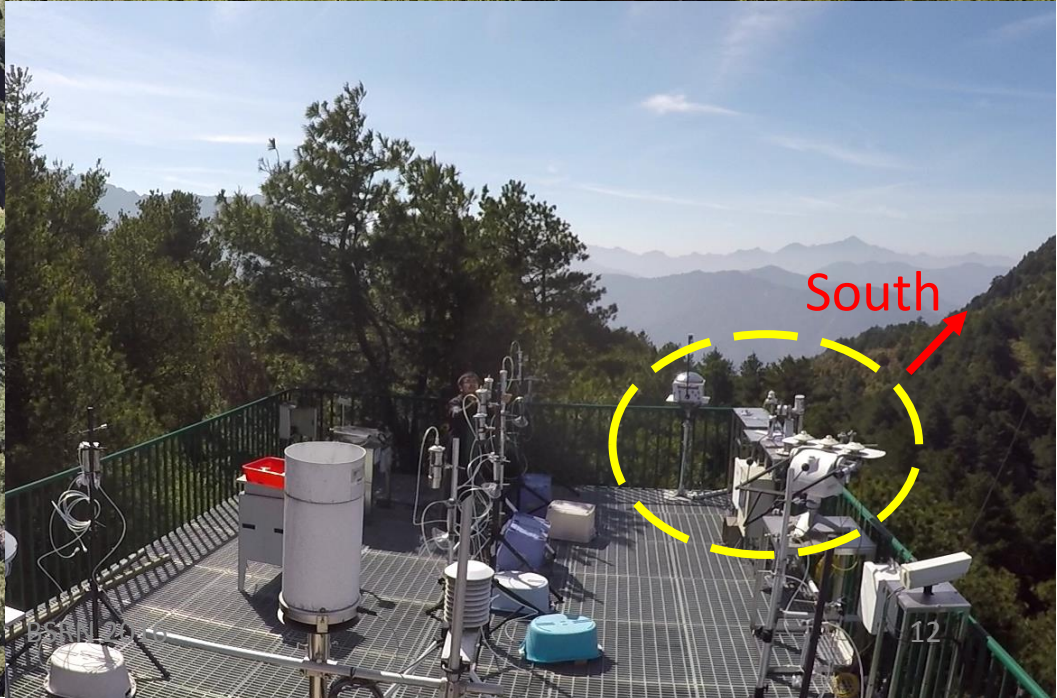
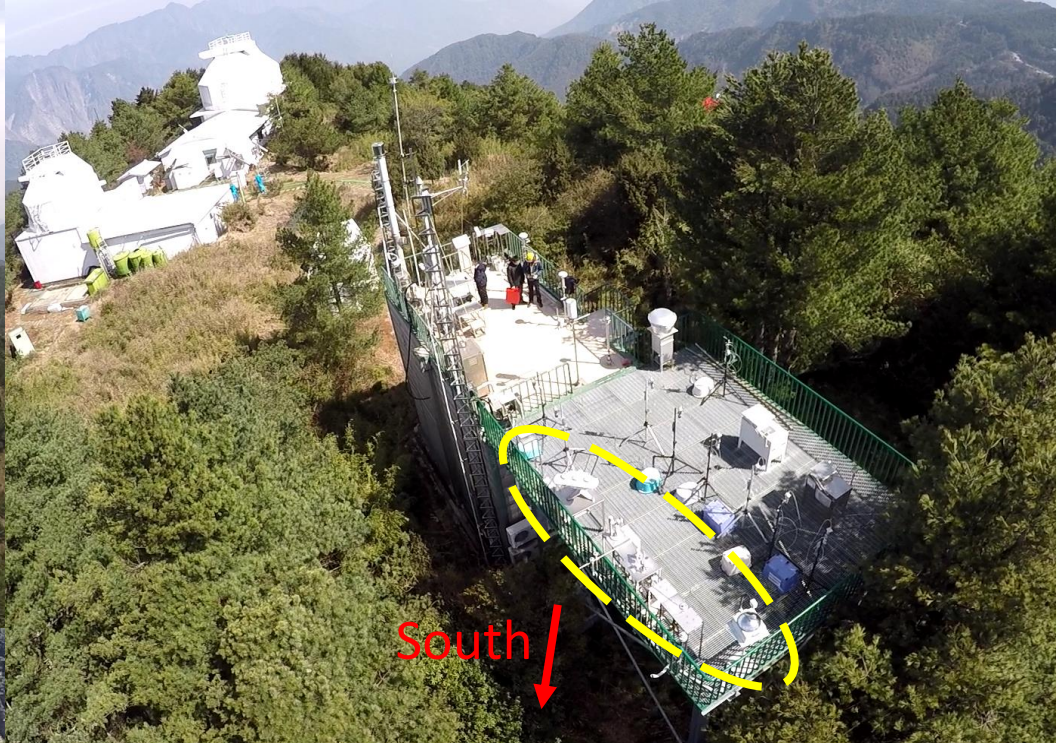
Lulin

Yushan Met. Station

Yushan
玉山

Yushan National Park
玉山國家公園

15 Km



25/06/2016

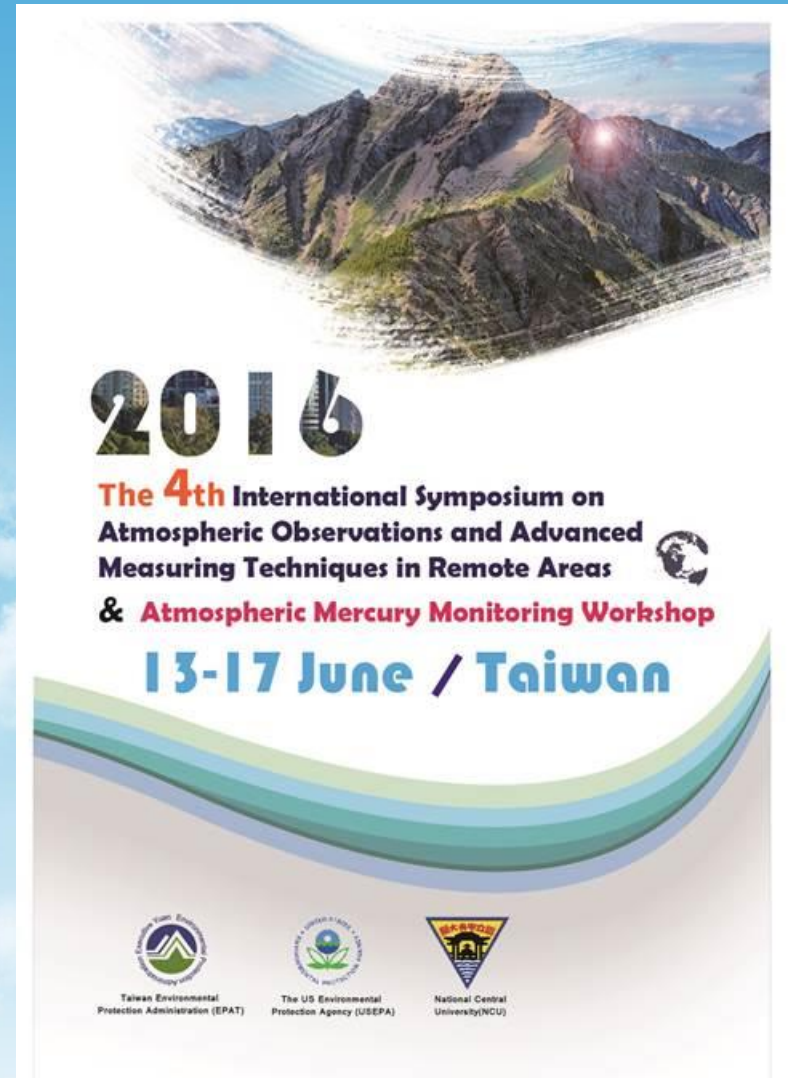
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Research Highlight


- **20+ papers published in past 5 years**
- **Identifying air pollutants in free troposphere**
 - **Indochinese biomass burning**
 - **Chinese haze**
 - **Upper-level ozone intrusion**
 - **Sahara/Middle East dust**
- **Radiation studies will be presented on Thursday**

10th anniversary of LABS




June 13-17, 2016
NCU, Taiwan



2016

The 4th International Symposium on
Atmospheric Observations and Advanced
Measuring Techniques in Remote Areas 
& Atmospheric Mercury Monitoring Workshop

13-17 June / Taiwan

 Taiwan Environmental Protection Administration (EPAT)  The US Environmental Protection Agency (USEPA)  National Central University (NCU)

The poster features a large, curved image of a mountain range under a blue sky with clouds. The text is arranged in a clean, modern layout. At the bottom, there are three logos: the Taiwan Environmental Protection Administration (EPAT), the US Environmental Protection Agency (USEPA), and National Central University (NCU).

Yushan Meteorology Station (3845 m)

Since 1943

23.49°N; 120.95°E



Obs. field

South

Solar panel array



Logistics

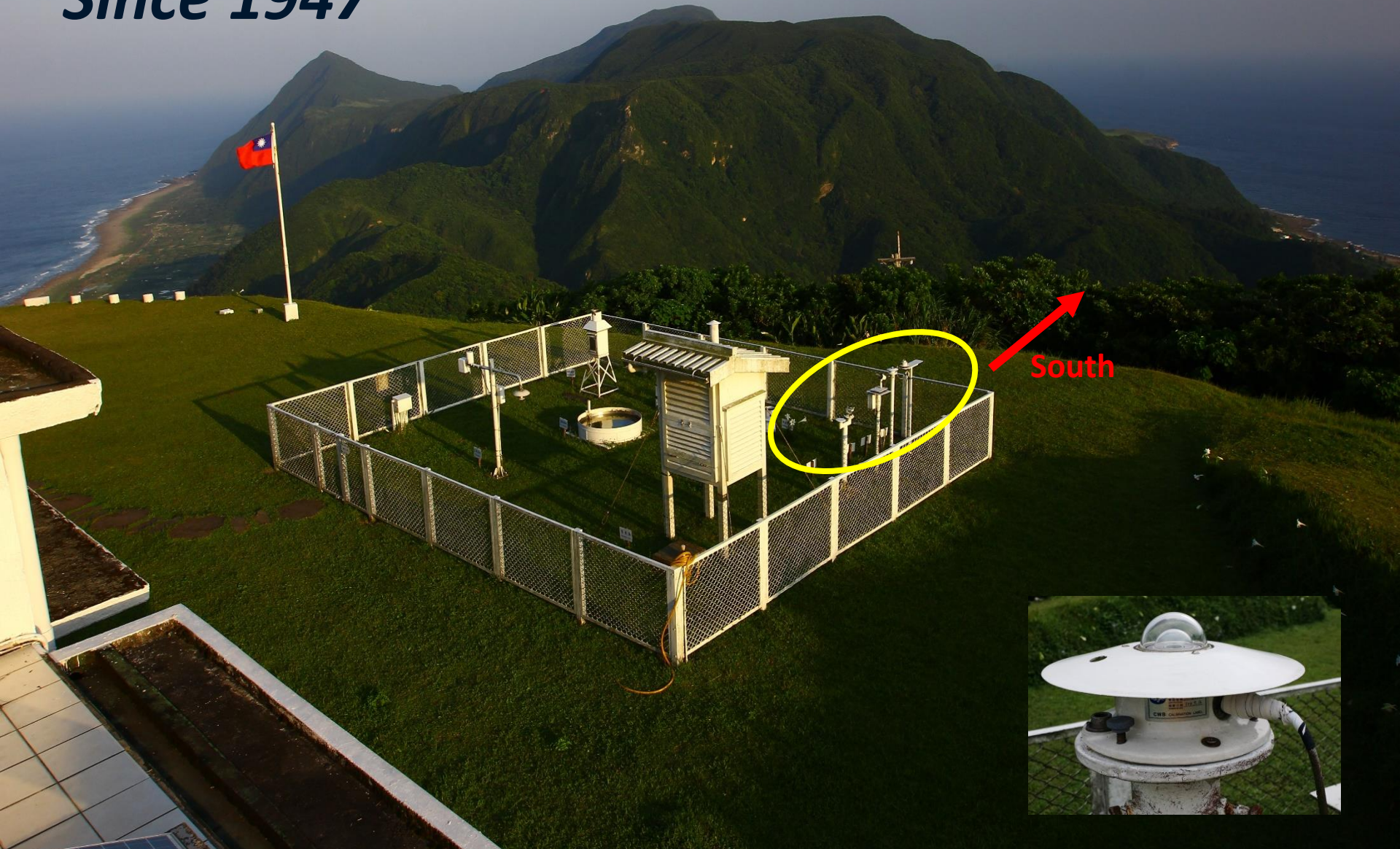


*Instrument issues
at clod climate*



Lanyu Meteorology Station (324 m)

Since 1947





Logistics



Lanyu Meteorology Station - main building



Air Quality Monitoring



Lanyu Atmospheric Background Station

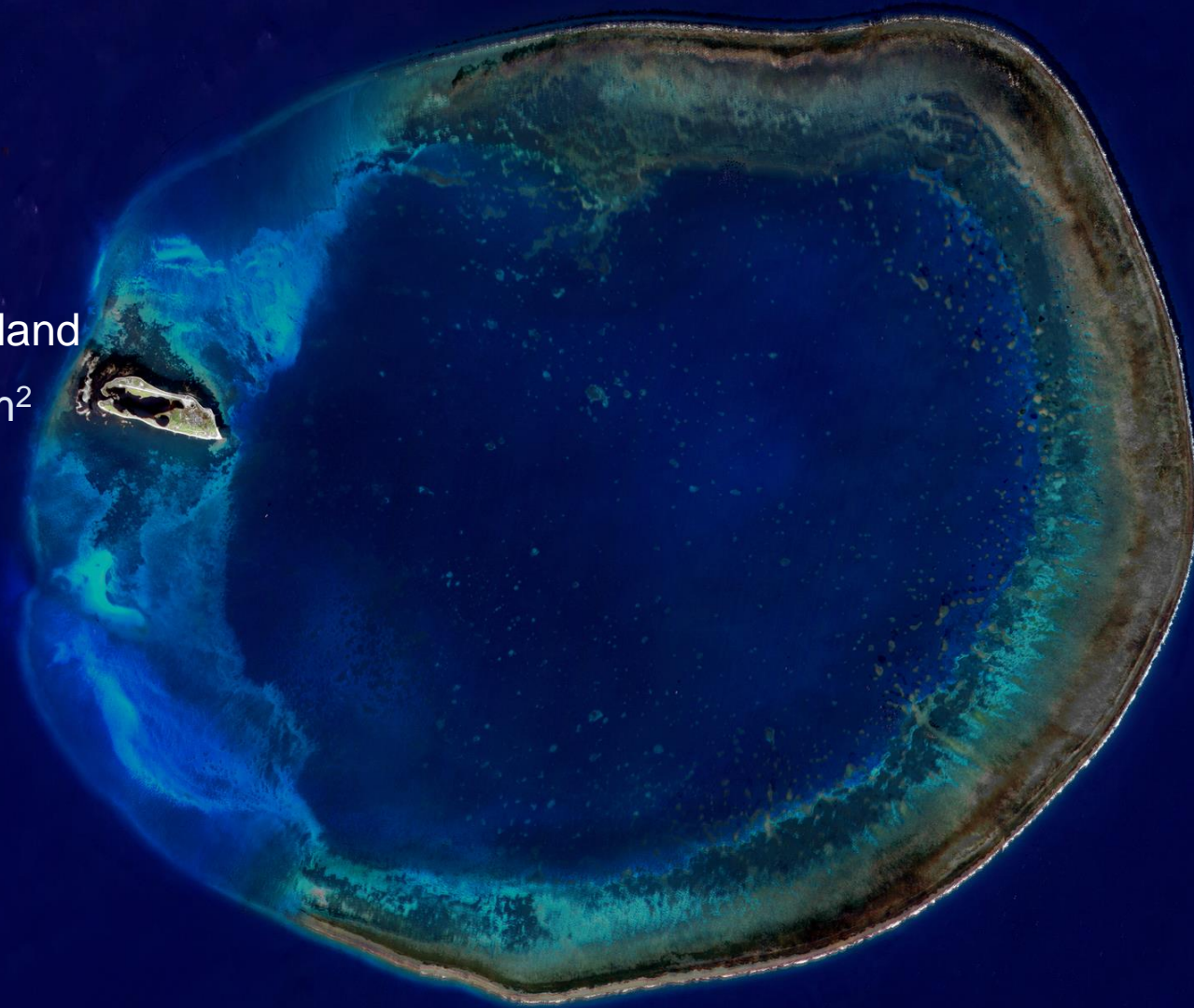


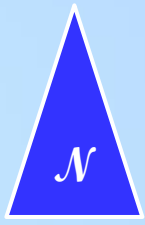
Standard traceable gases



Dongsha Atoll (National Park)

Dongsha Island
~2 km²





Logistics



東沙群島



Platform and Instruments



N



E



W



S



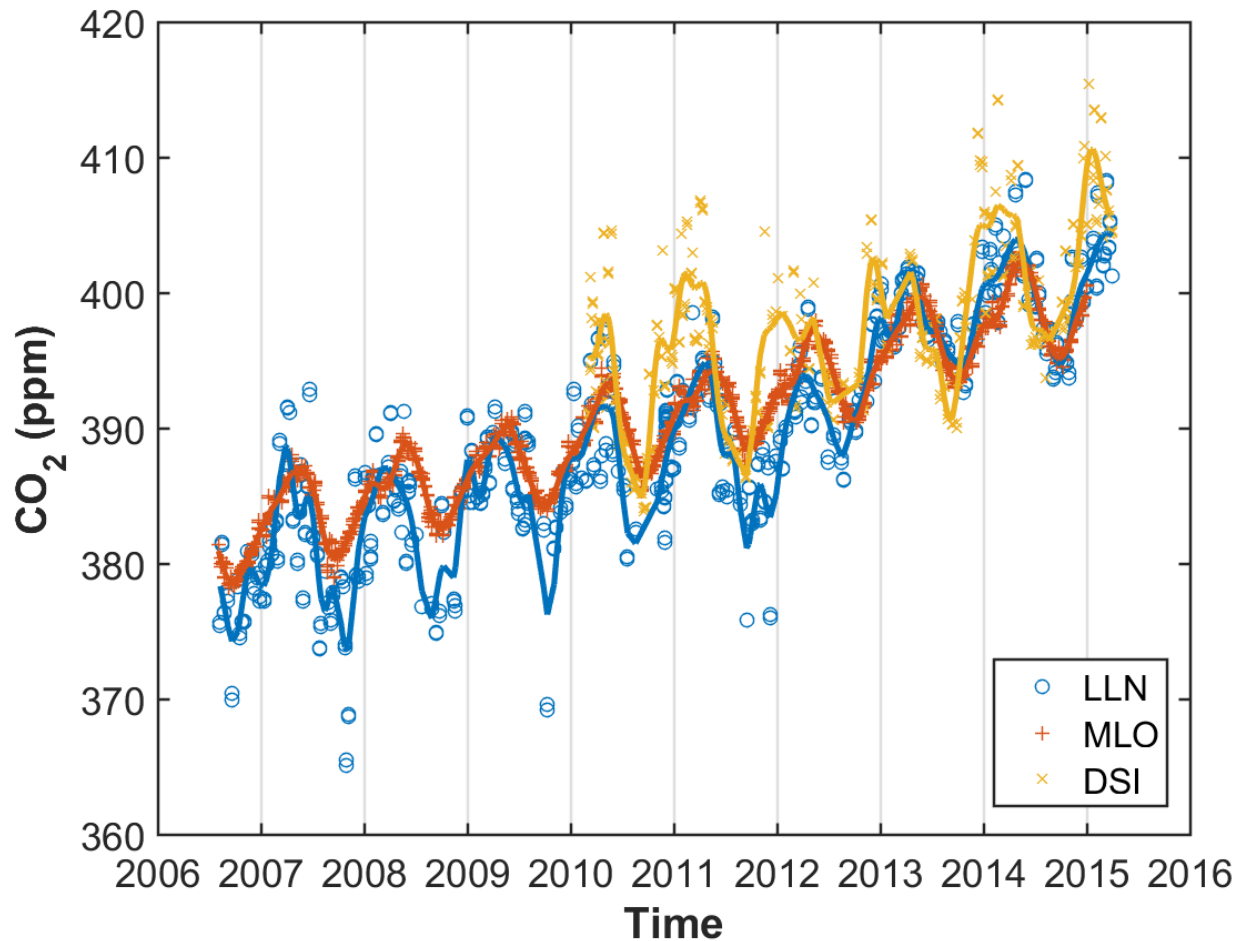
23/06/2016

BSRN 2016

Summary

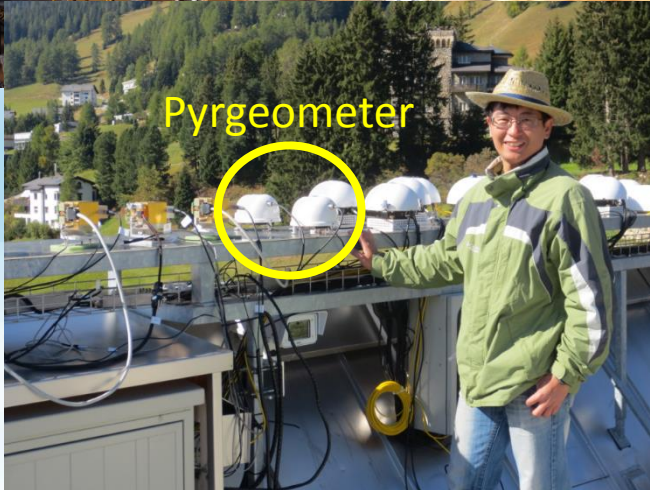
Site	Elevation	maintenance	Instruments	Scientific Potentials
Lulin	2863 m	Unmanned station; weekly	Kipp&Zonen <i>Solys2, CMP21, CGR4, CHP1</i>	<ul style="list-style-type: none"> • Aerosol-radiation interaction in free troposphere
Yushan	3845 m	Manned station; daily	TBD <i>Proposed to be installed in 2017</i>	<ul style="list-style-type: none"> • Aerosol-radiation interaction in free troposphere • stratospheric volcanic aerosol and climate • Outdoor calibration research
Lanyu	324 m	Manned station; daily	TBD <i>Proposed to be installed in 2017</i>	<ul style="list-style-type: none"> • Radiation budget and typhoon genesis • Maritime environ. radiation
Dongsha	5 m	Manned station; weekly	Kipp&Zonen <i>Solys2, CMP21, CGR4, CHP1</i>	<ul style="list-style-type: none"> • Radiation budget over marginal sea • linkage with oceanography researches

All co-located with AERONET and CCGG observations



**NOAA/GMD
cooperative
sampling network**
Greenhouse gases
Carbon stable
isotopes

Calibration procedures in progress



September-October, 2015 at Davos

Thank you!



Please come by and talk to me if you have any suggestions to our sites.