

# Japanese Group Land-based “Intensive” Observation Plan

Participants from Japan: JAMSTEC, Kyoto-U, Hokkaido-U, U-Tokyo, U-Toyama, Nagoya-U, Yamaguchi-U, etc.

## Boreal Winter Rainfall Study

When: Nov 2017 - Jan 2018  
Where: Sumatra, Indonesia  
What/How: Diurnal cycle, MJO, etc. study by radars, sondes, etc.

## TTL/UTLS Study

When: Not decided  
Where: Kototabang, Biak (Indonesia), Hanoi (Vietnam), etc.  
What/How: Equatorial waves, Dehydration process, etc. using EAR (radar), Water vapor/Ozone sonde, and so on.

## Boreal Summer Monsoon Study

When: July - Aug 2017  
Where: Vietnam, Philippines, Palau  
What/How: Seasonal March of Western Pacific Monsoon by enhanced radiosonde, X-band Doppler radar, Lidar, etc.

# Intensive Observation off and on Sumatra

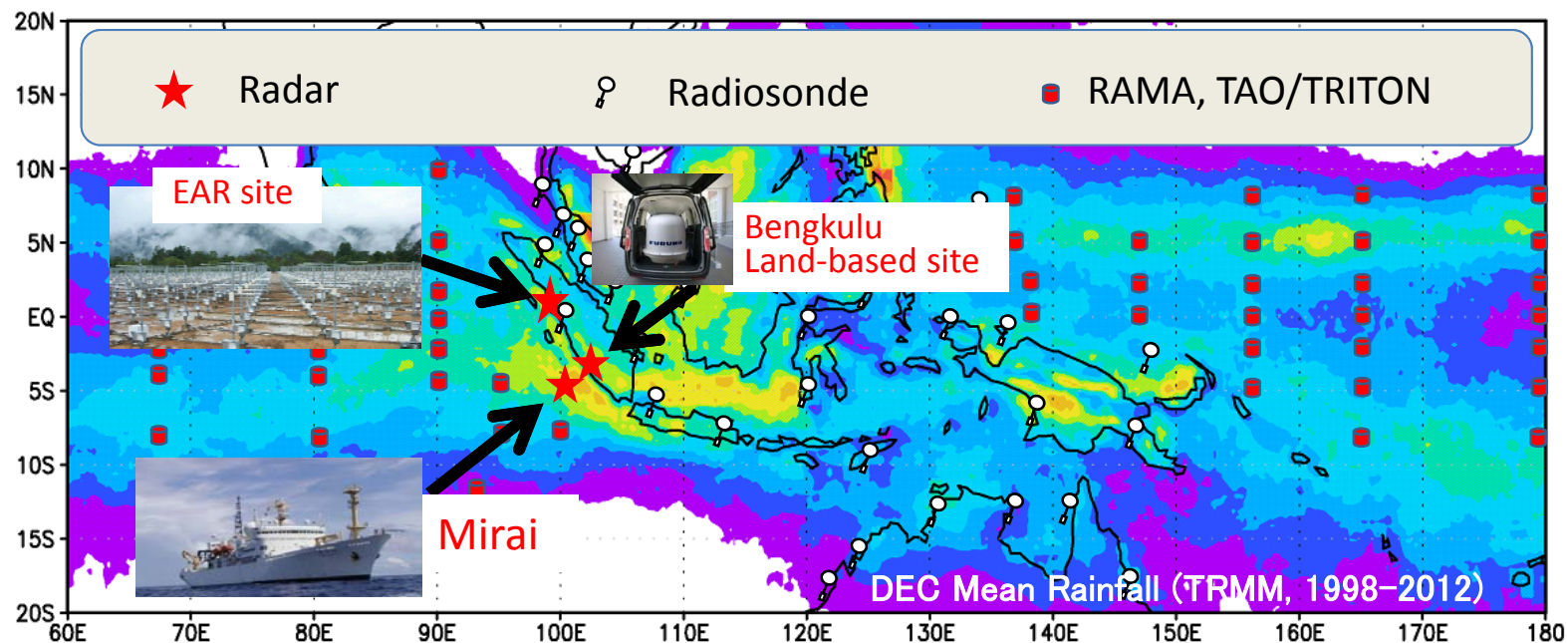
**Purpose:** Study of precipitation mechanism off and on Sumatra, with focus on the relationship to

- 1) Diurnal cycle near the coast of south-west Sumatra,
- 2) MJO, and
- 3) SST condition over the oceanic upwelling region.

**Period:** Nov 2017 - Jan 2018

**Observations:** R/V Mirai, Land-based sites (Bengkulu, Kototabang), Moored Array

**Remarks:** Decision to the R/V Mirai cruise proposal is in pending.



# Land-based Observations at Bengkulu, Sumatra

Objective: Precipitation near the coast line

Period: Nov 2017 – Jan 2018

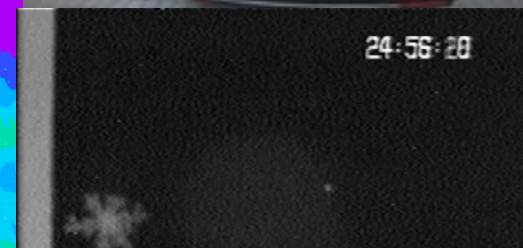
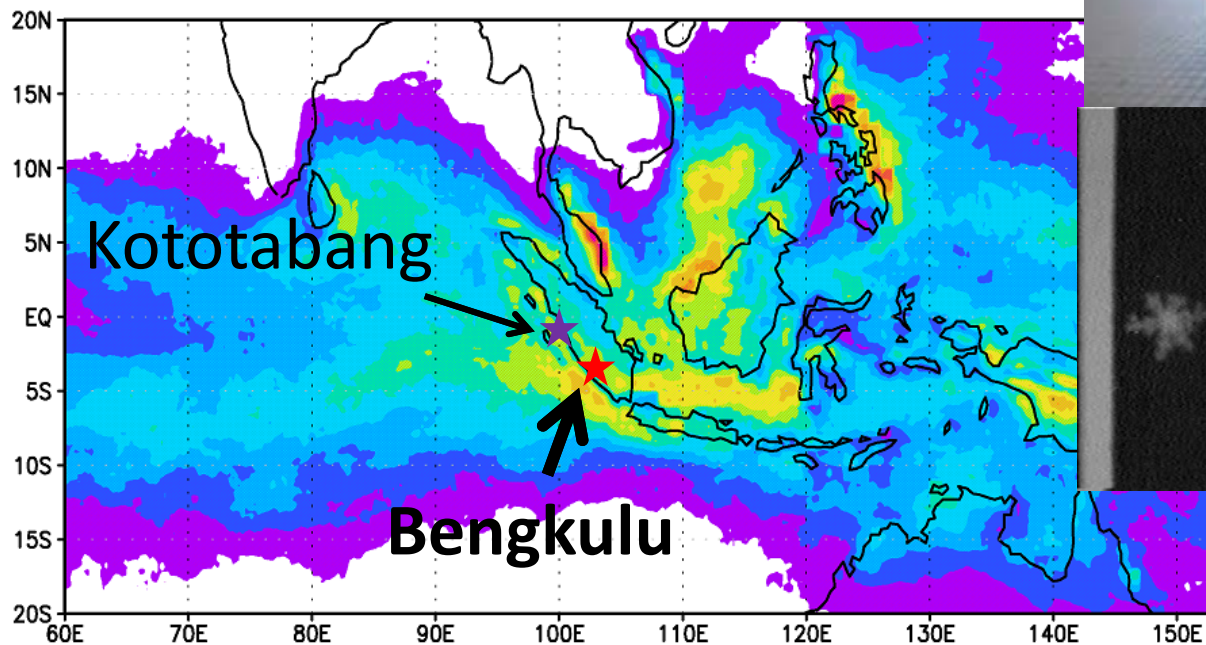
Observations: X-band Polarimetric Doppler Radar

Radiosonde

Videosonde

Automated Weather Station

Disdrometer



Courtesy of K. Suzuki (Yamaguchi U)

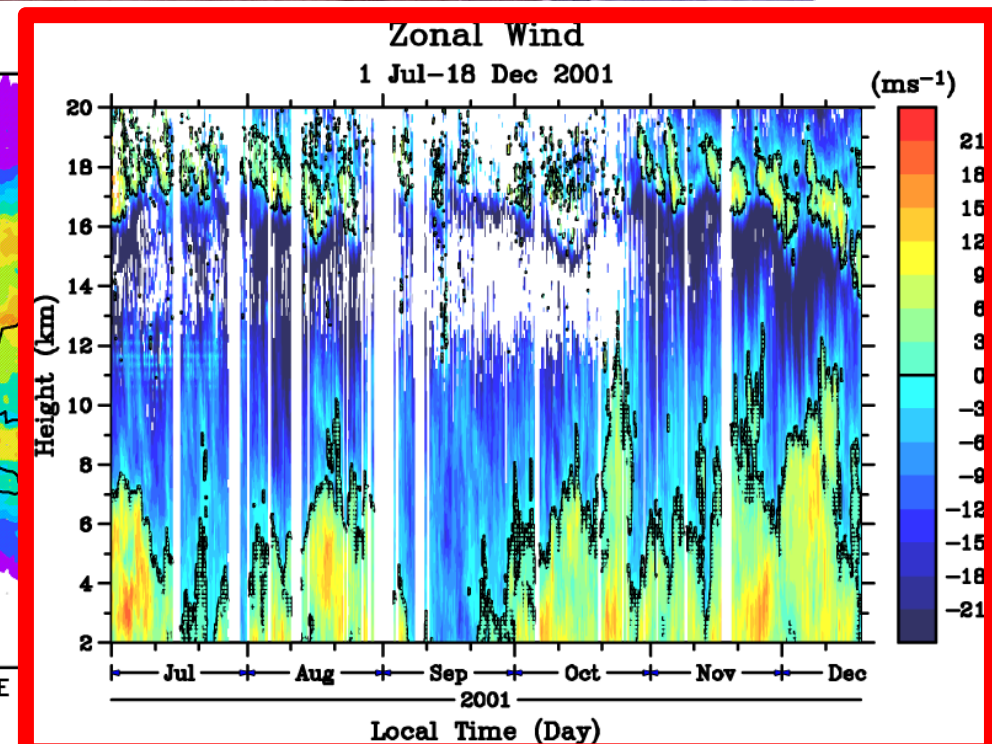
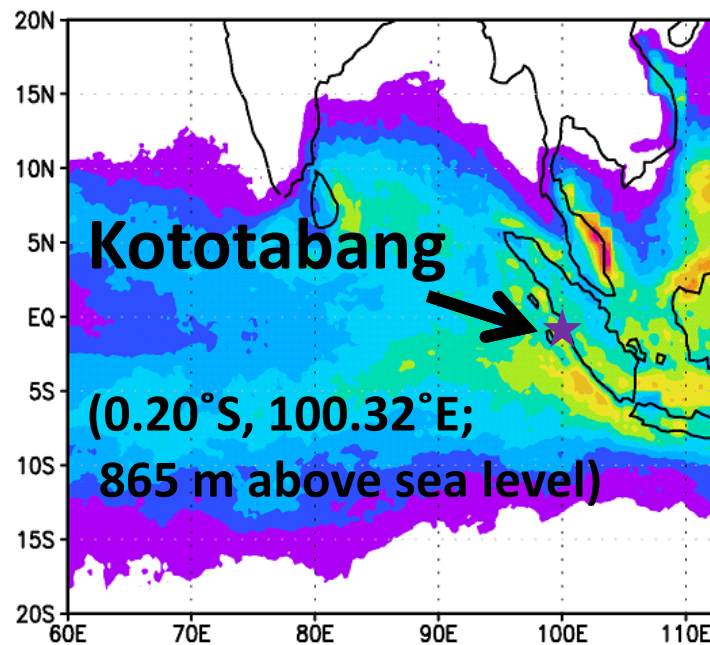


# Land-based Observations at Kototabang, Sumatra

Equatorial Atmosphere Radar (EAR) operated since July 2001 by Kyoto University with the help of LAPAN, Indonesia



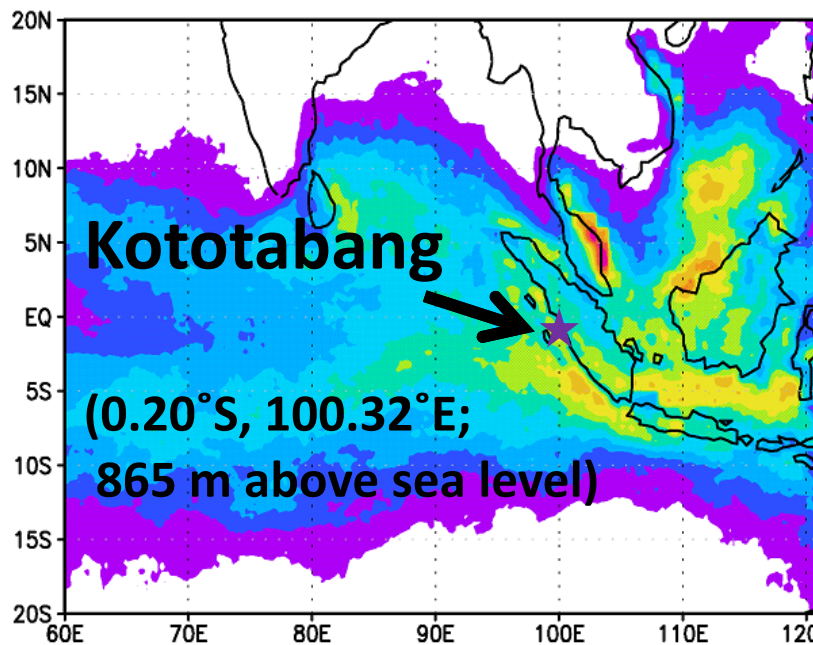
47 MHz, Antenna array (110 m in diameter)



Courtesy: Hiroyuki Hashiguchi (Kyoto Univ.)

# Land-based Observations at Kototabang, Sumatra

Equatorial Atmosphere Radar (EAR) operated since July 2001 by Kyoto University with the help of LAPAN, Indonesia



## Equatorial Atmosphere Observatory

- EAR
- X-band Doppler Radar
- Lidar
- MF Radar
- Optical Imagers
- Surface Meteorology



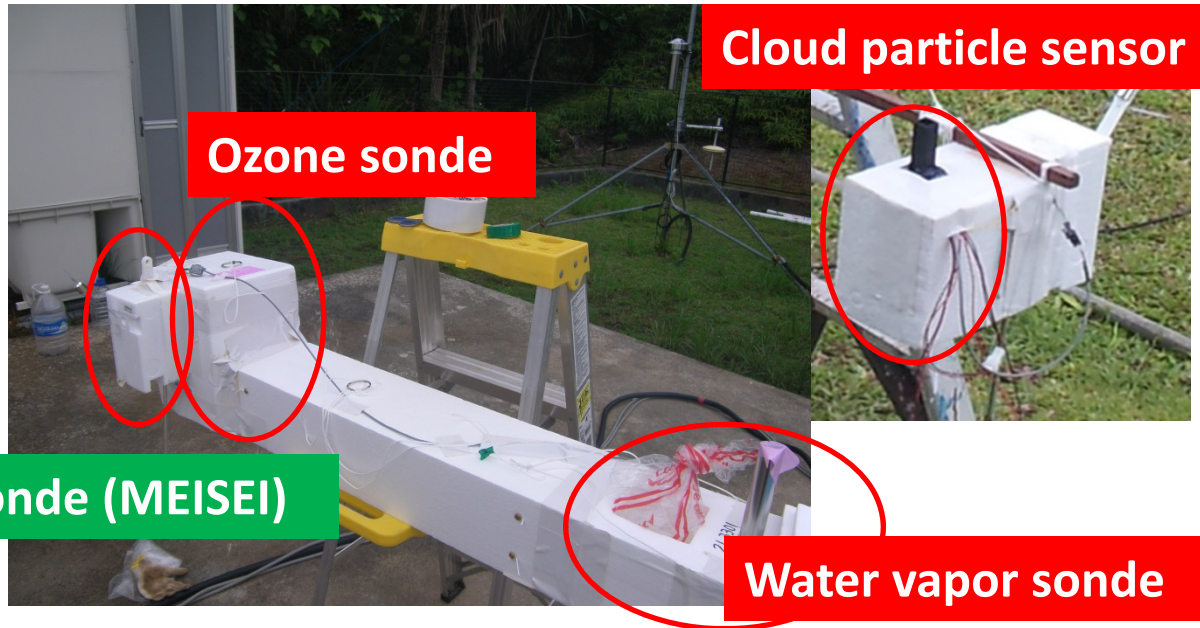
Courtesy: Hiroyuki Hashiguchi (Kyoto Univ.)



# Land-based Observations at Kototabang, Sumatra



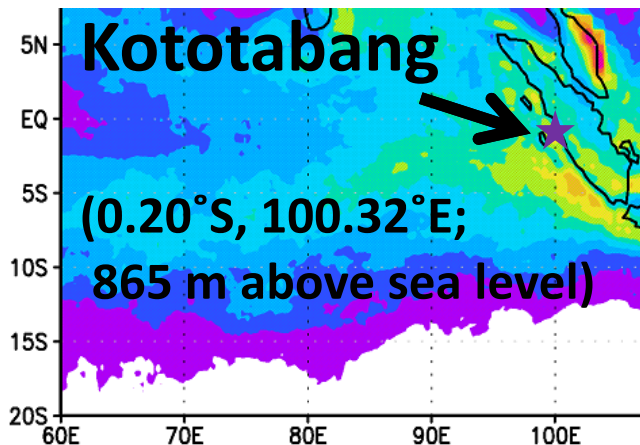
Radiosonde (MEISEI)



Ozone sonde

Cloud particle sensor

Water vapor sonde



In conjunction with EAR, special sonde equipped with

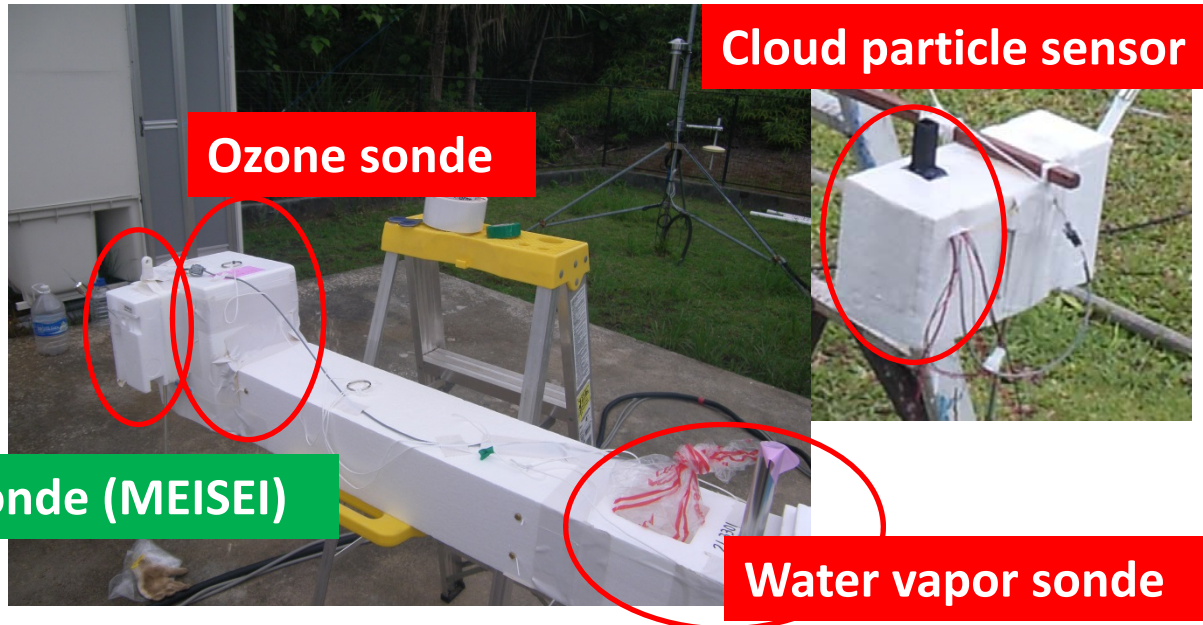
- 1) High accurate water vapor sensor,
- 2) Ozone sensor, and
- 3) Cloud particle sensor

will be launched to study dehydration effect by equatorial waves in TTL.

# Other Possible Sites for TTL/UTLS Studies



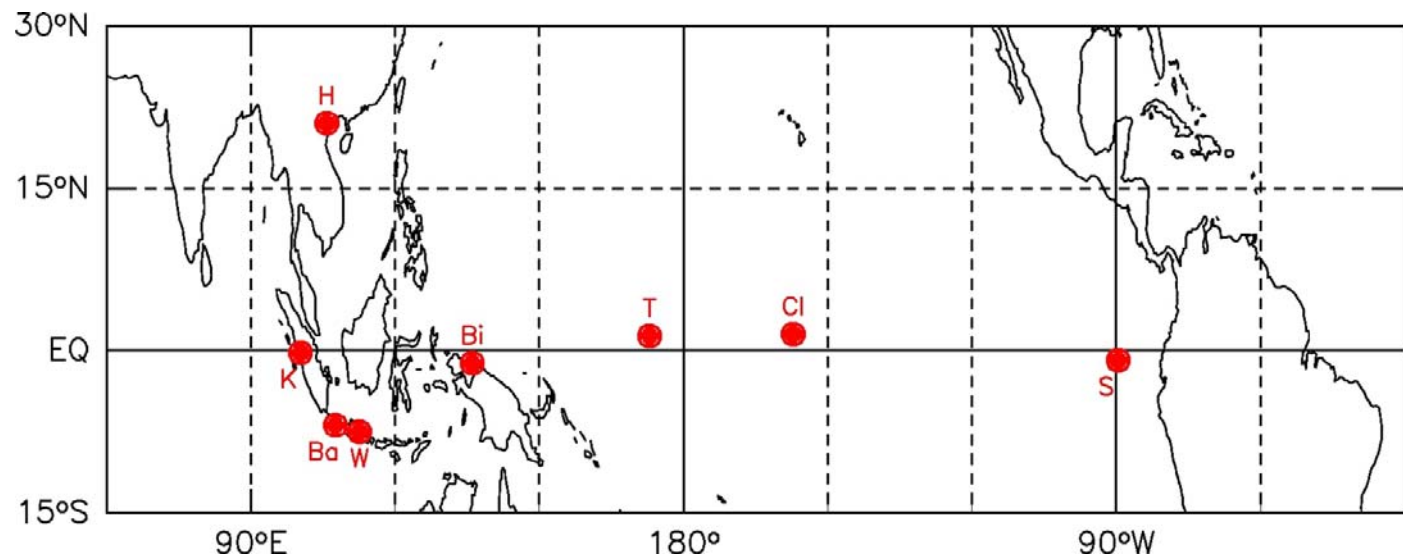
**Radiosonde (MEISEI)**



**Cloud particle sensor**

**Ozone sonde**

**Water vapor sonde**



Courtesy: Junko Suzuki (JAMSTEC) & Masatomo Fujiwara (Hokkaido Univ.)



# Western North Pacific Summer Monsoon Study

Period : July -Aug 2017

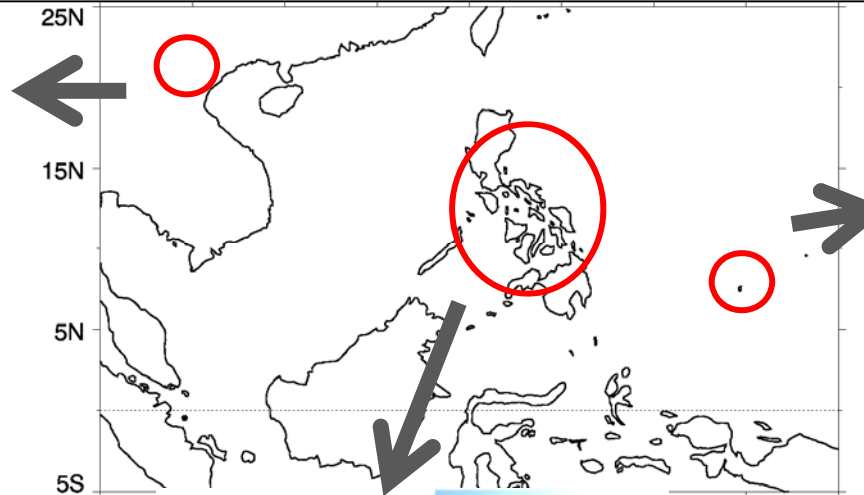
Objectives : Seasonal march of MNPSM

Role of westerly wind flow, cross equatorial flow and their air-sea interaction



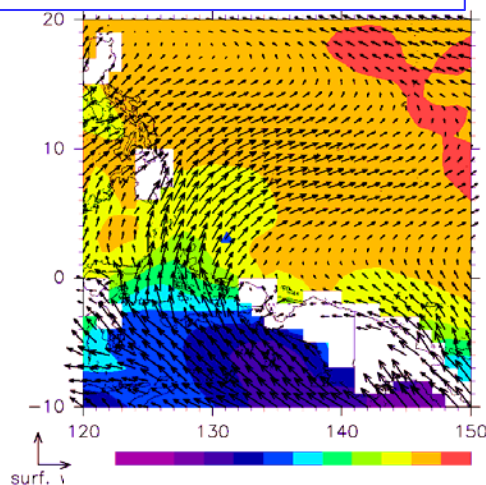
Vietnam (with NHMS)

Ozone + CFH-sonde  
VLF Lightning Detector  
AWS



Palau (with Met Office)

X-band Doppler radar  
LIDAR  
AWS  
Disdrometer



Kubota et al. (2011)



Philippines (with PAGASA)

Enhanced Radiosonde Sounding  
AWS at Tacloban & Guiuan  
Doppler Radar at Cebu  
VLF Lightning Detector



# Another Possible Observation in (2017 or) 2018

## Aeroclippers in YMC

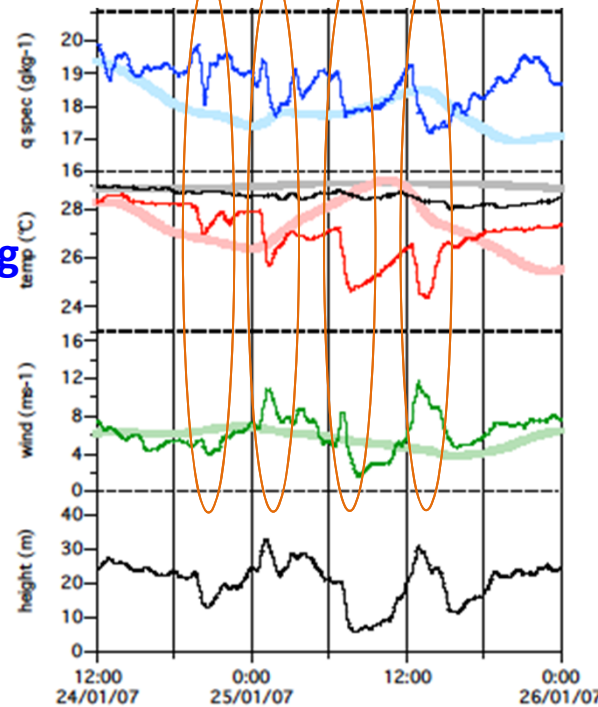
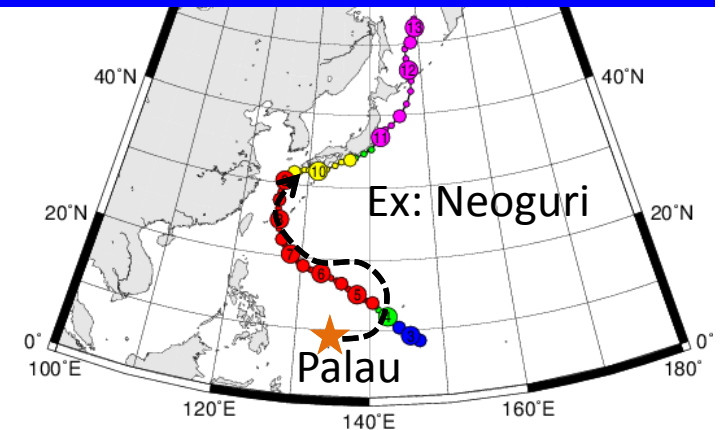
Quasi-Lagrangian near surface observation device developed by French CNES and LMD.

First campaign VASCO (2007): two Aeroclippers in cyclone DORA (*Duvel et al 2009 BAMS*).

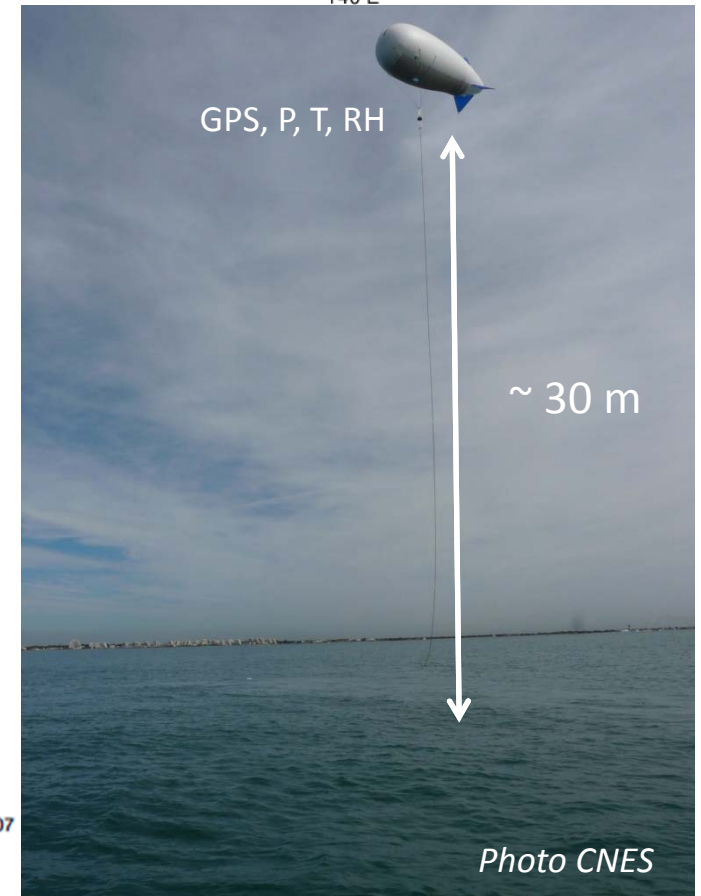
French-Japanese collaboration in YMC (CNES-LMD-JAMSTEC) to launch aeroclippers from Palau and/or other possible sites.

### Applications:

- Cyclone pressure monitoring
- Cold pool statistics
- Air-sea fluxes
- ...



*Duvel et al. (2009 BAMS)*



*Photo CNES*