

# **WALK-AROUND OBSERVATION**

Chiba Campaign 2020-12-03 & 12-07

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Irie Lab.  
Sano, Kobayashi, and Ohno

# Objectives

## Main Objectives

### **This Observation was carried out ...**

- To study spatial distribution of the gases( $\text{CH}_4$ ,  $\text{CO}_2$ , and  $\text{H}_2\text{O}$ ) on a local scale(Vertically and Horizontally).
- To examine and estimate the emissions of the gases.

## Today's Objective

### **Today's Observation was carried out ...**

- To study the difference of  $\text{CH}_4$  conc. and variability  
between heights AND between the weather

# Instrument LI-7810 Trace Gas Analyzers

## Gases

CH<sub>4</sub>, CO<sub>2</sub> and H<sub>2</sub>O [concentration]

## Measurement

OF-CRAS

(Optical Feedback – Cavity Enhanced Absorption)

## Features

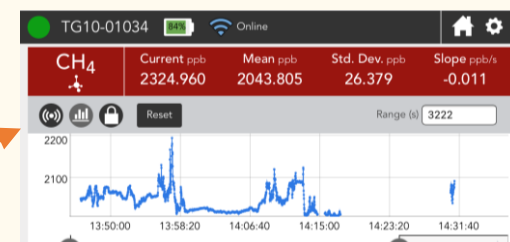
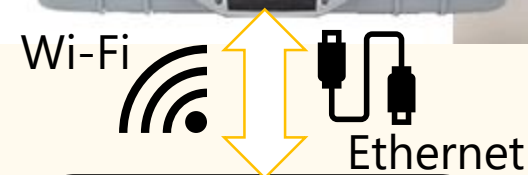
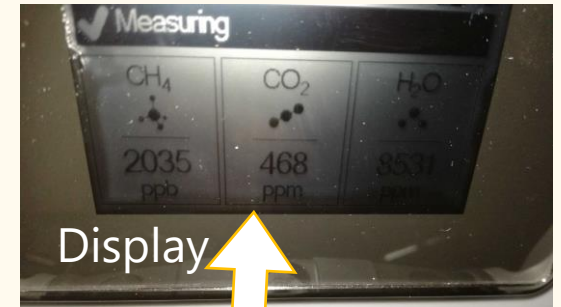
- Precise
- Stable
- Portable
- Low power and Low maintenance

## Temporal Resolution

1 measurement / 1 sec

※More Details See⇒[http://www.meiwafosis.com/products/analyzer/li7810\\_li7815/li7810\\_li7815\\_tokucho.html](http://www.meiwafosis.com/products/analyzer/li7810_li7815/li7810_li7815_tokucho.html)

## LI-7810 Instrument Info



# Today's Observation

Chiba Campaign 2020-12-07

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Irie Lab.  
Sano and Ohno

# Overview Observation Sites and Info

## Condition(2020-12-07) Chiba Site

- Weather: Sunny
- Temperature: 14~17 °C
- Relative Humidity: 32~44 %
- Wind Direction: S~W

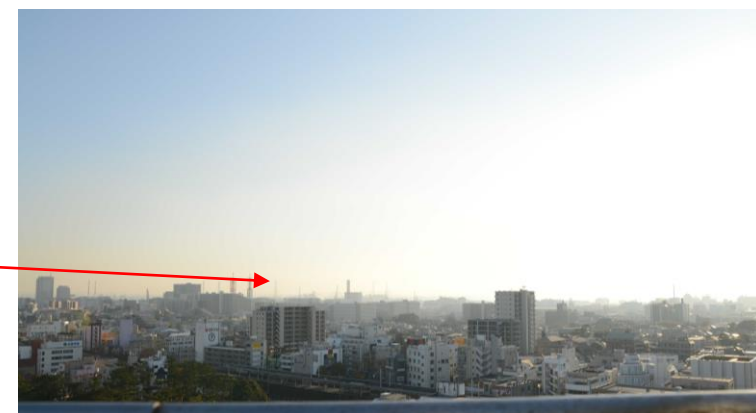
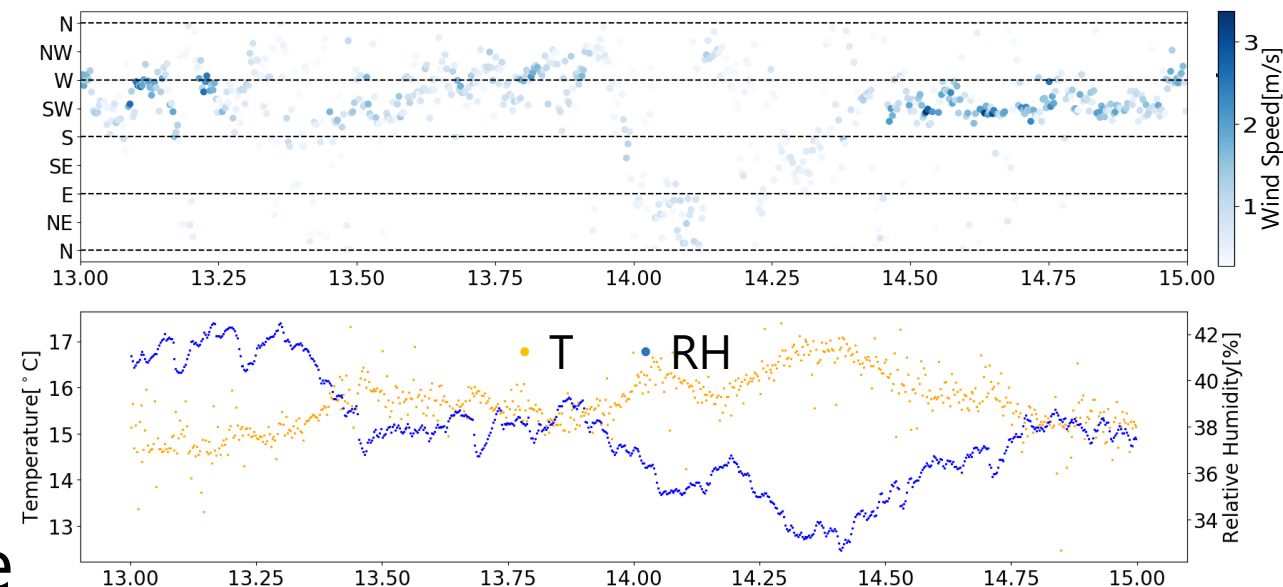
## Site Info

- **South:** Keiyō(京葉) Industrial Zone
- South(14), North(14&16) and East(124): Trunk roads

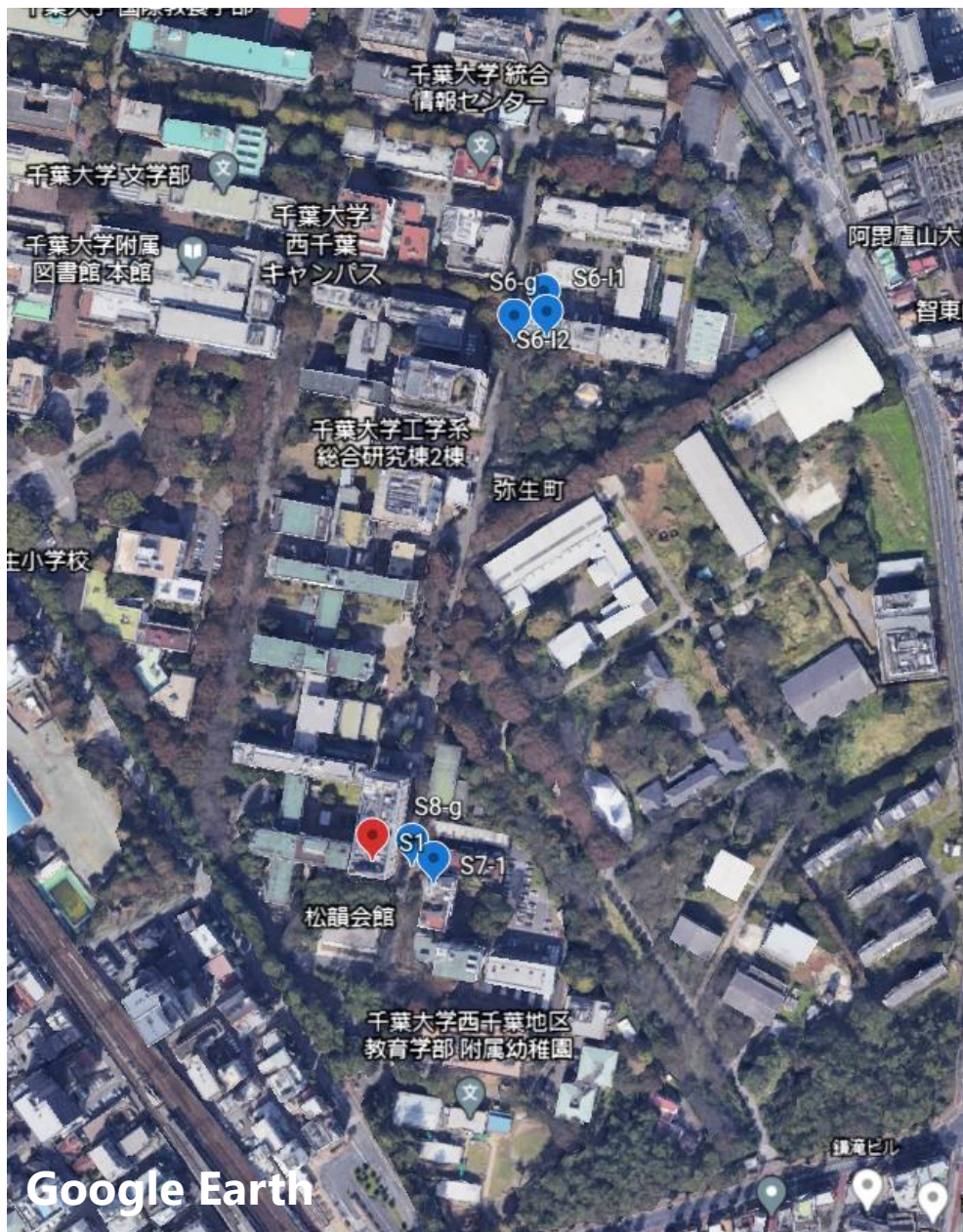
## Chiba Univ.

- SKYNET site 60 m a.s.l.
- Rooftop 2 sites at Univ.
- Univ. Ground 21 m a.s.l.

Chiba Site(35.625N, 140.104E, 60 m a.s.l.)



# Details Observation Sites and Info



## Route

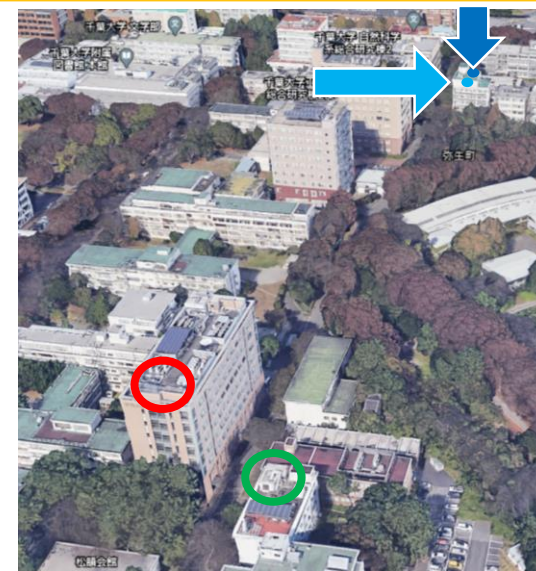
S1⇒S6⇒S7⇒S1

## Time

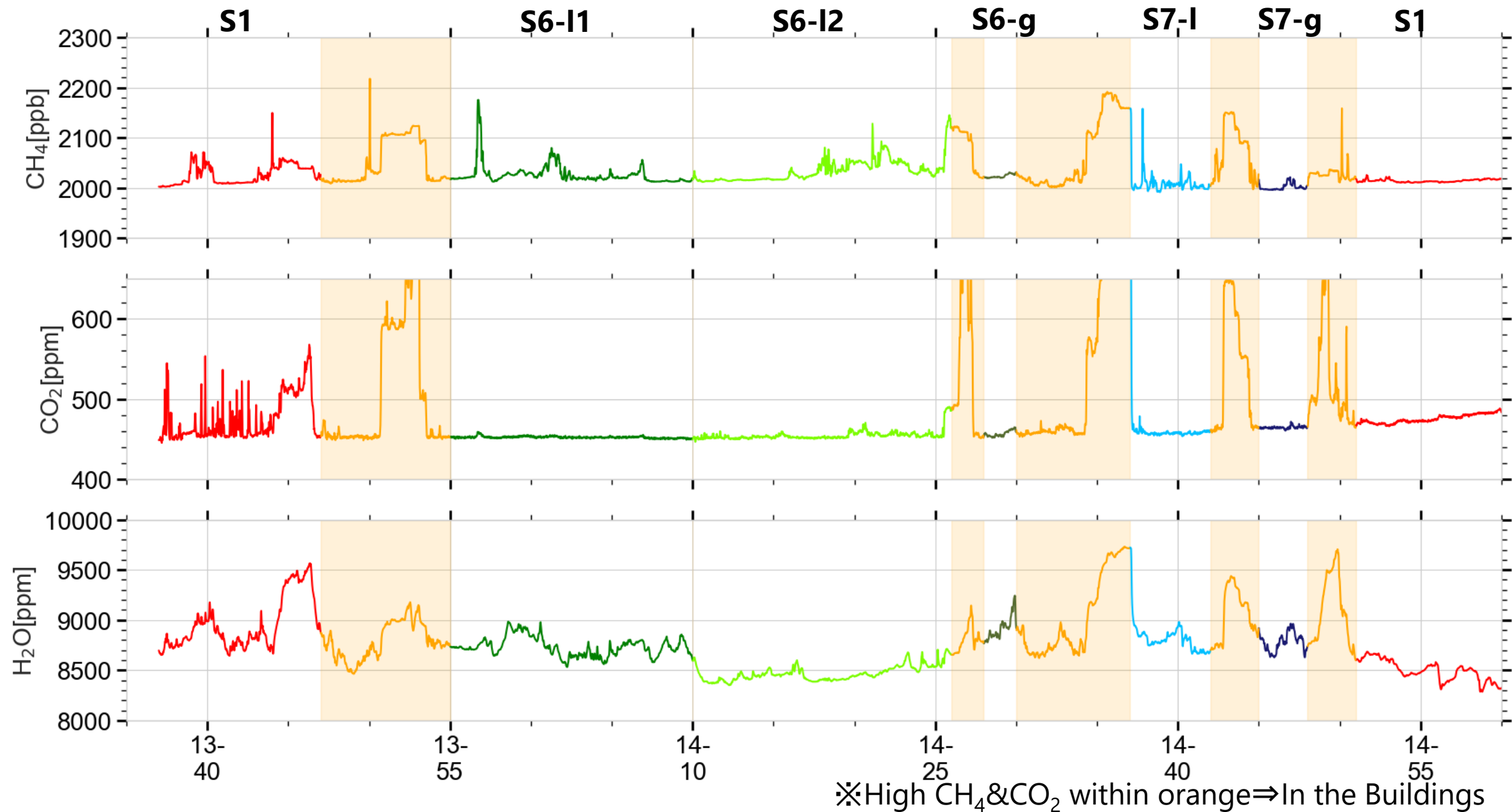
13:37—15:00

## Sites Info

Site	Name	Description	Time
S1	工学系総合研究棟1屋上	60 m a.s.l.	~13:42, 14:51~
S6-l1	フロンティア医工学センター	屋上 南側	13:55~14:10
S6-l2	同上	屋上 北側	14:10~14:26
S6-g	同上	道路北側	14:28~14:30
S7-l	環境リモセン	屋上	14:37~14:42
S7-g	同上	道路	14:45~14:48



# Result



# Findings & Insight

## Today's Findings

**CH<sub>4</sub>**

No big difference of CH<sub>4</sub> conc. and variability between heights

**CO<sub>2</sub>**

Stable

**H<sub>2</sub>O**

Small difference between sites

Next

Comparison between 12/3 and 12/7







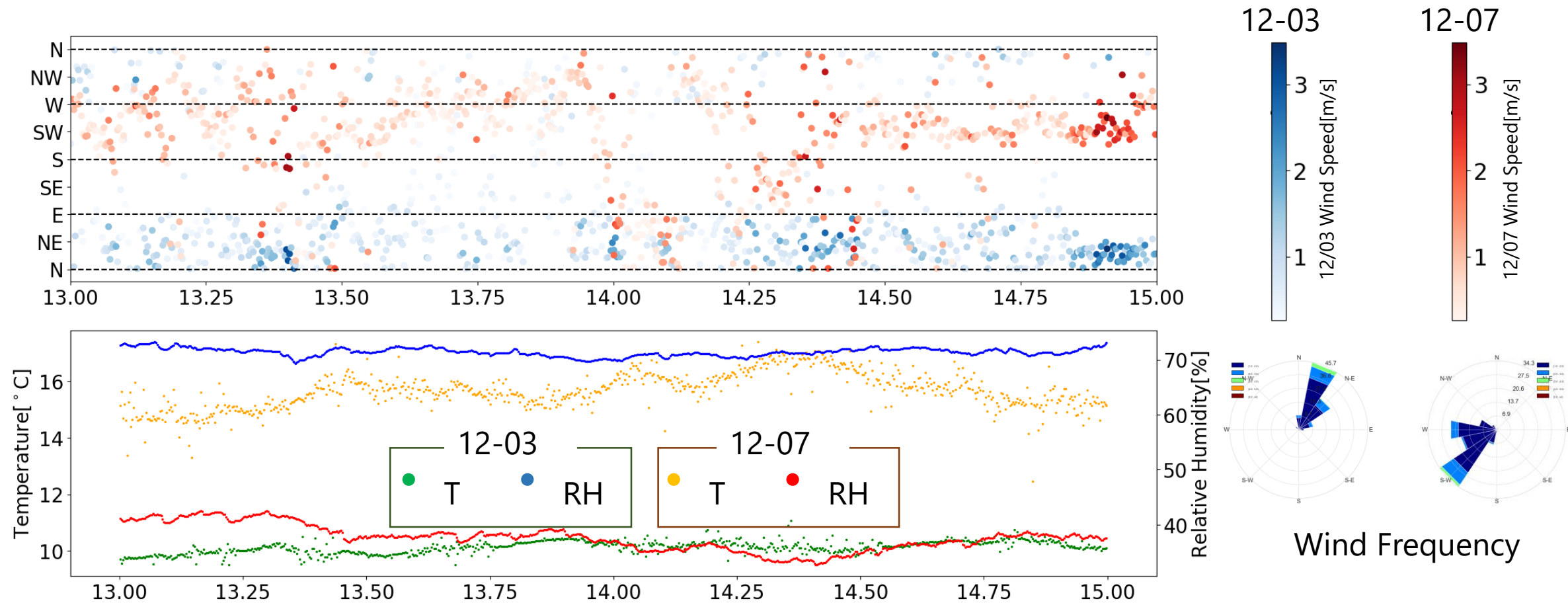
# Comparison

## 12/03 vs 12/07

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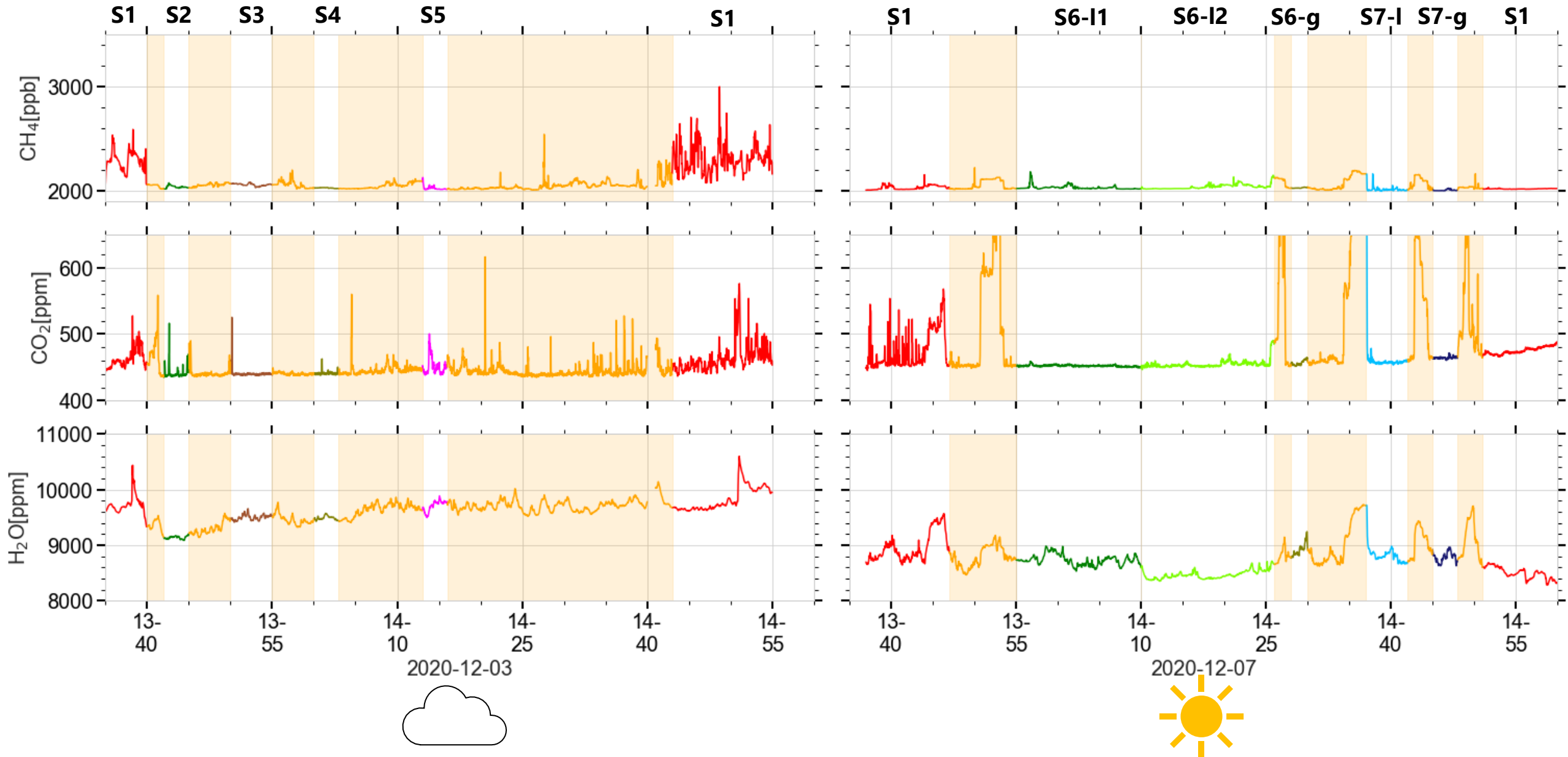
# Comparison Conditions

Date	Weather	Temp.(°C)	RH(%)	WD	Yesterday Weather
12-03	Cloudy 	9~11	70~73	N~NE~E	Rainy 
12-07	Sunny 	14~17	32~44	S~SW~W	Cloudy 



# Comparison Gases

Concentrations of gases [Chiba Campaign]



## Comparison

### CH<sub>4</sub>

- Under N~E wind direction & cloudy weather(on 12/03)  
⇒ The difference of CH<sub>4</sub> conc. and variability between heights(60 & 21 m) represented vertical profile
- Under S~W wind direction & sunny weather(on 12/07)  
⇒ There are no clear vertical CH<sub>4</sub> profile

### CO<sub>2</sub>

- CO<sub>2</sub> conc. at SKYNET site(60 m a.s.l.) is representative value over Chiba Univ.

### H<sub>2</sub>O

- The difference of conc. ⇒ Because of the weather

# Methane

## Methane Budget

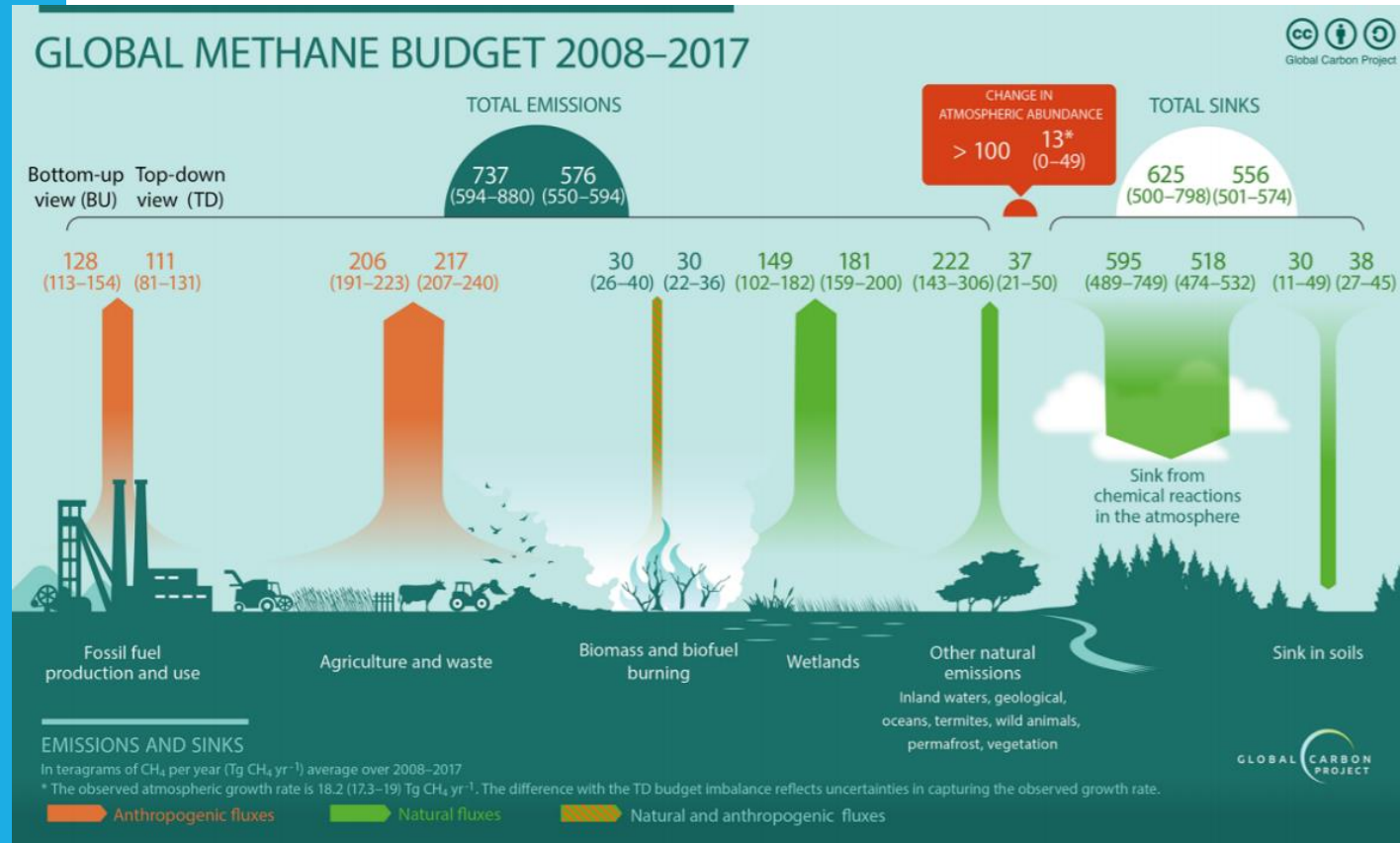
### Emission

#### ◆ anthropogenic origin(60%)

- Agriculture and waste
- Fossil fuel production and use
- biomass and biofuel burning

#### ◆ natural origin(40%)

- wetland
- inland waters, geological, termites, wild animals ...etc



### Sink

#### ◆ chemical reactions in the atmosphere

- oxidation by the hydroxyl radical (OH), (90%)
- tropospheric chlorine
- stratospheric chemistry

#### ◆ Soil uptake

Source : Saunois et al. 2020, ESSD (Fig. 6)

(estimation for 2008 - 2017, unit : Tg CH<sub>4</sub> yr<sup>-1</sup>)