
# Daily Report (2021/08/03)

▶AEROSOL analysis

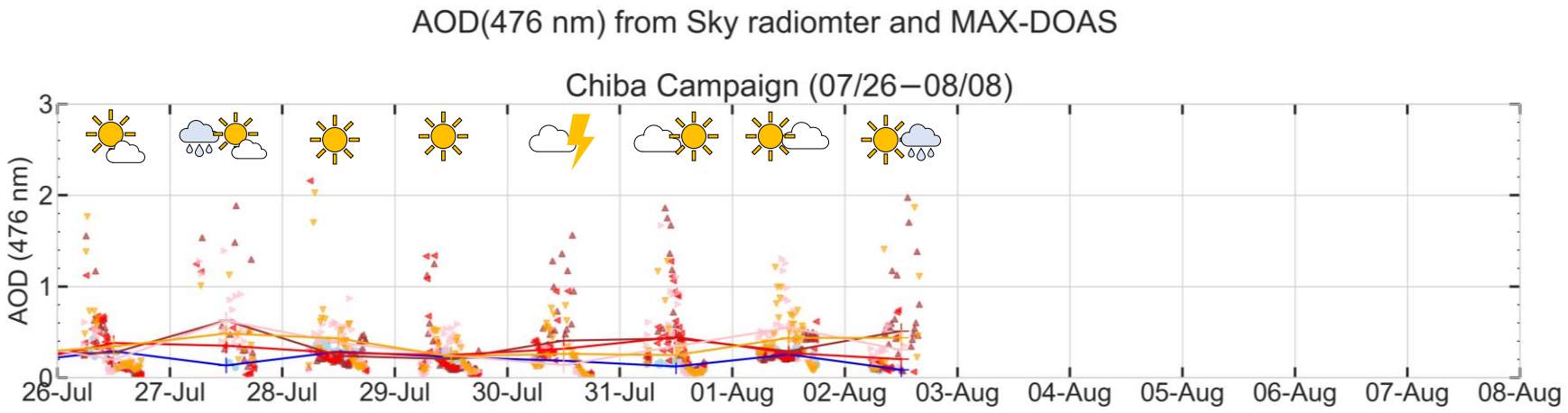
AOD from Sky radiometer & MAX-DOAS

by Irie Lab. M1 Takeru Ohno

MAX-DOAS
Measurement Directions


Irie et al., 2017

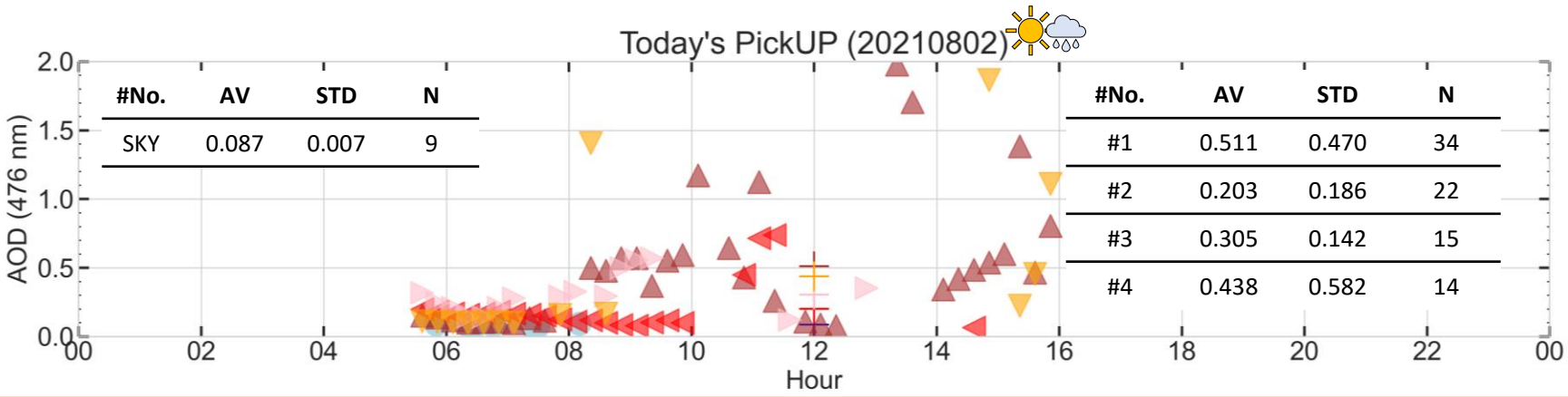
# AOD from Sky radiometer(476 nm) & MAX-DOAS(476 nm)




Daily Mean
- SKY Daily
- MAX D #1
- MAX D #2
- MAX D #3
- MAX D #4

Original
- SKY Original
- MAX O #1
- MAX O #2
- MAX O #3
- MAX O #4

Sky Cloud Flag=0




| #No. | AV | STD | N |
|---|---|---|---|
| SKY | 0.087 | 0.007 | 9 |

| #No. | AV | STD | N |
|---|---|---|---|
| #1 | 0.511 | 0.470 | 34 |
| #2 | 0.203 | 0.186 | 22 |
| #3 | 0.305 | 0.142 | 15 |
| #4 | 0.438 | 0.582 | 14 |

Today's AOD

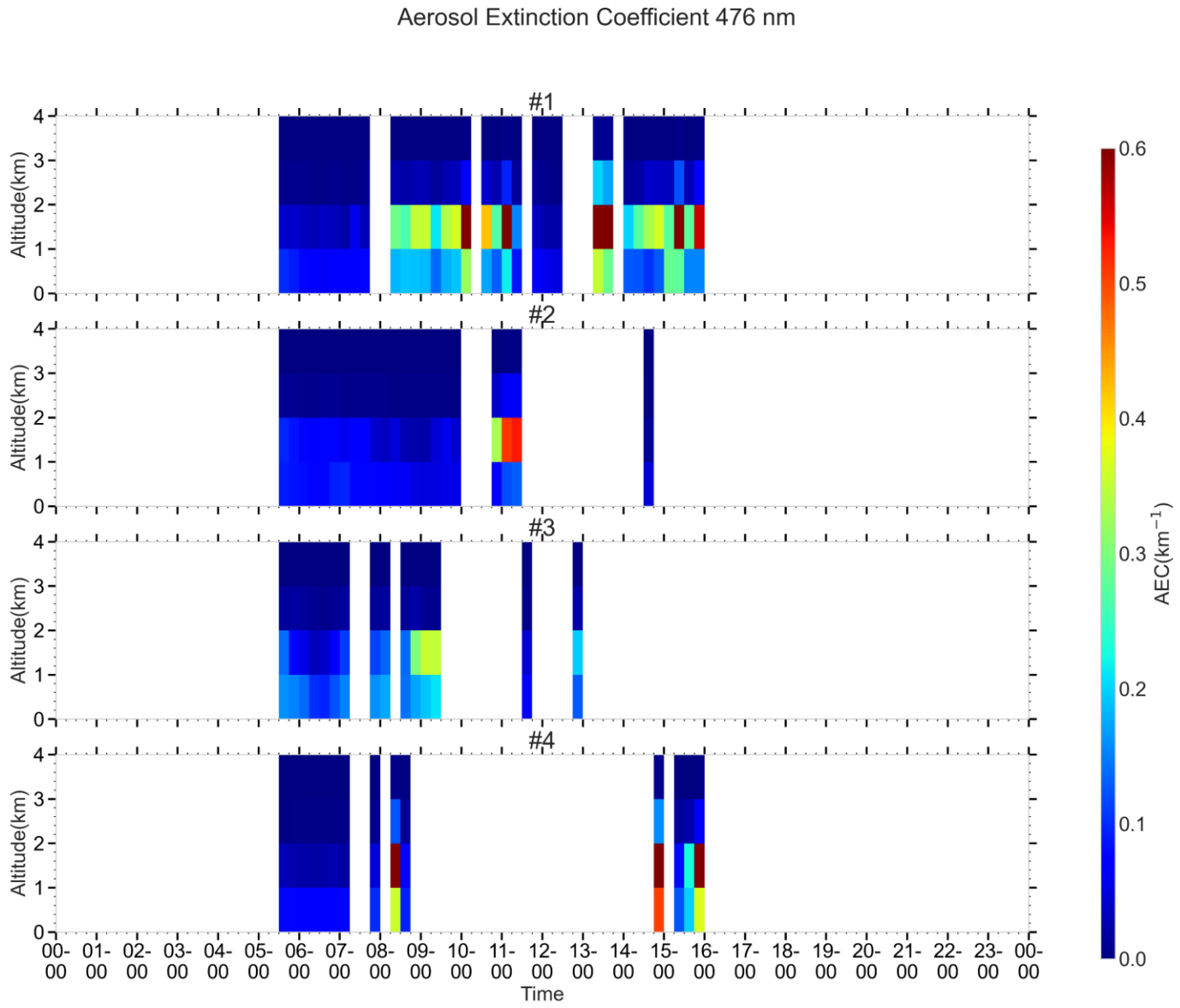


※Wavelength interpolation of Sky radiometer AOD from 500 nm to 476 nm

$$\tau_{476} = \tau_{500}\left(\frac{476}{500}\right)^{-AE}$$

(Fig. Irie et al., 2017)

# AEC (MAX-DOAS)



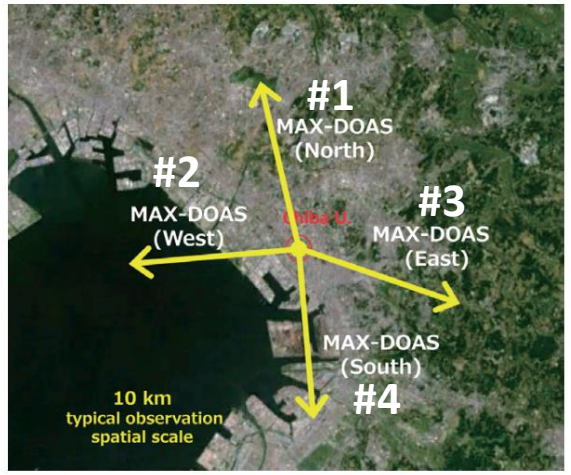
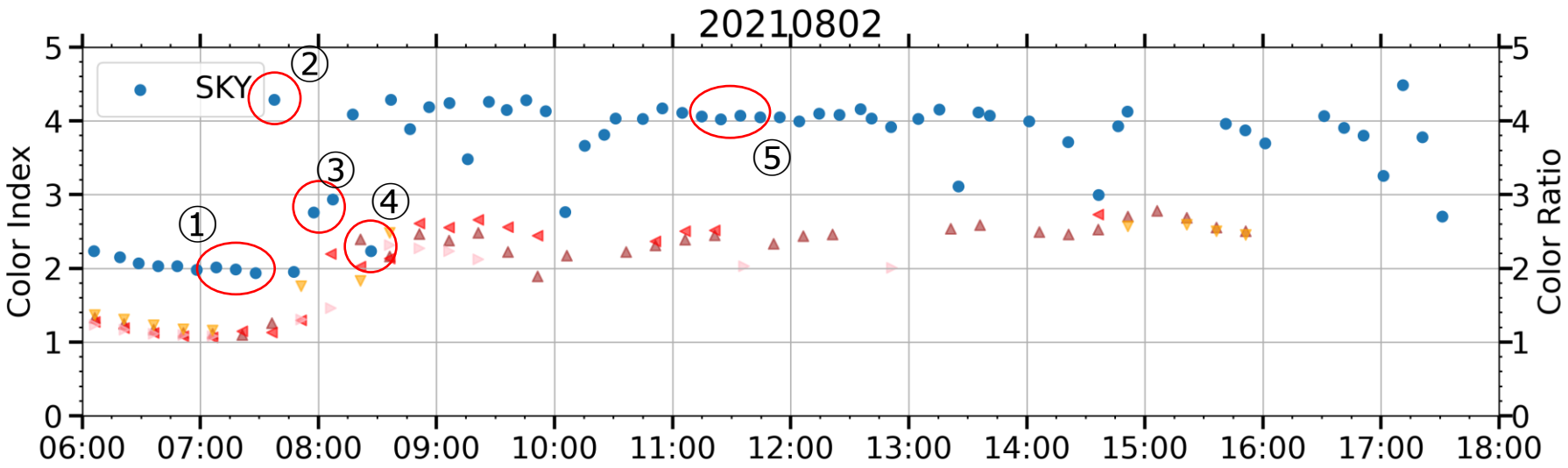
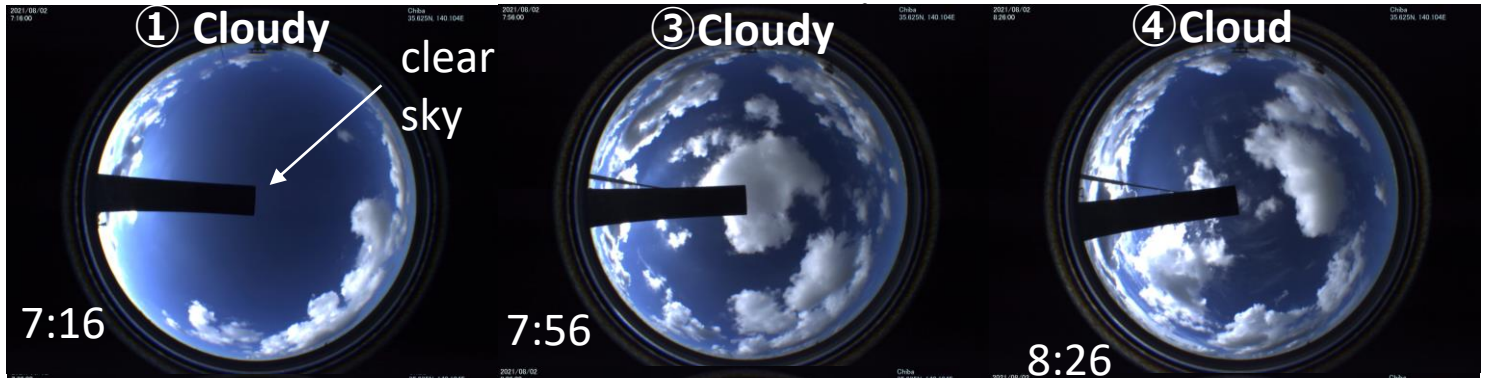




**Fig. 5** Schematic illustration of observations by the North-, West-, East-, and South-viewing MAX-DOAS instruments (this set is called the 4AZ-MAXDOAS system) located at the SKYNET Chiba site (Chiba University).

Irie et al., 2017

# Color Index(MAX-DOAS) and Color Ratio (Sky radiometer) 8/2













※Time gap
sky radiometer
=skyview+1min
(e.g.)
skyradio:7:17
skyview:7:16

**Color Index(CI)**

$$\mathrm{CI} = \frac{I_{\mathrm{Longwave}}}{I_{\mathrm{shortwave}}} = \frac{I_{500}}{I_{380}}$$

Takashima et al., 2009

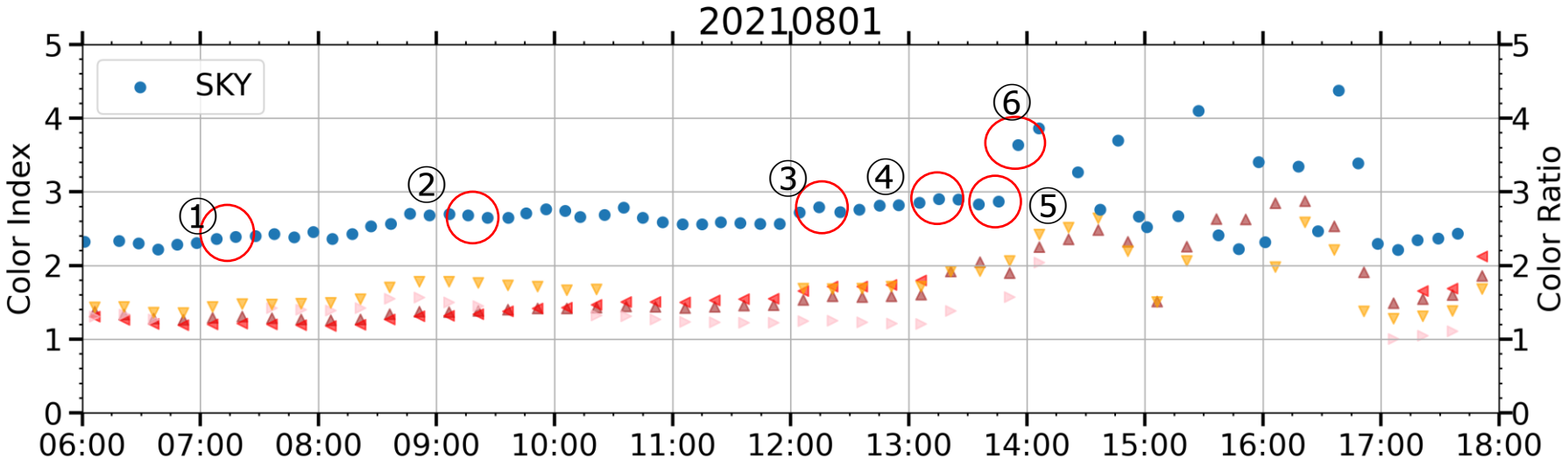
**Color Ratio(CR)**

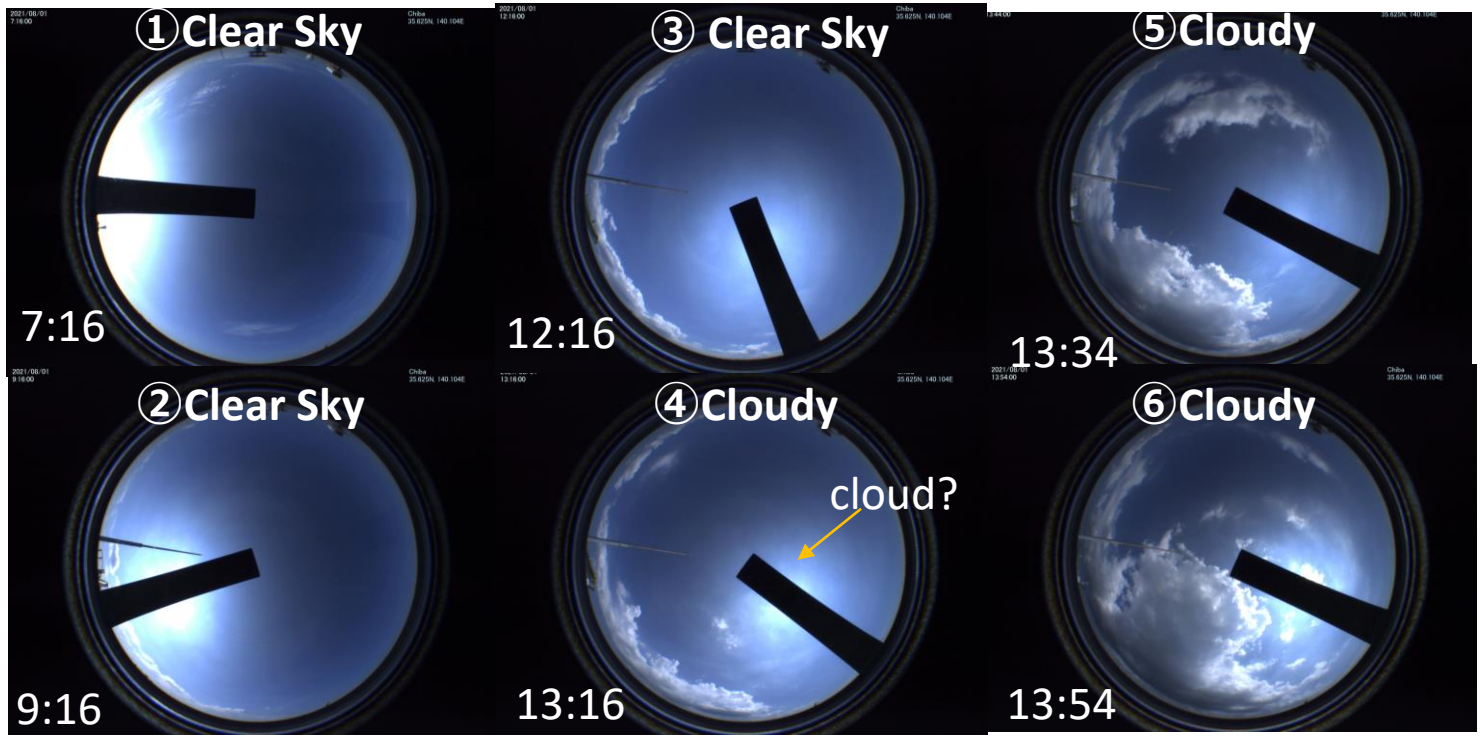
$$\mathrm{CR} = \frac{R_{\mathrm{Longwave}}}{R_{\mathrm{shortwave}}} = \frac{R_{500}}{R_{400}}$$

*R*: radiance
$R_{500}=F_0(500)\times V$
$R_{400}=F_0(400)\times V$
where,
$F_0$(400nm)=1.23e-04,
$F_0$(500nm)=2.34e-04

No cloud condition (zenith)
▶time variation, around CR=2
NEXT ▶There is a need to see different days to figure out the Quantitative Value of time variation and Threshold of CR.

# Color Index(MAX-DOAS) and Color Ratio (Sky radiometer)　8/1

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where,

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$F_0$(500nm)=2.34e-04

※Time gap

sky radiometer

=skyview+1min

(e.g.)

skyradio:7:17

skyview:7:16

Definition of No cloud condition (zenith)

▶based on time variation & CR ≦ 3?

NEXT ▶There is a need to see different days to figure out the Quantitative Value of time variation and Threshold of CR.