(GOSAT-BBM)

Observation of greenhouse gases absorption spectra at Mt. Tsukuba using the SWIR FTS (GOSAT-BBM)

( ) [a] [b] ( )

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The Greenhouse gases Observing SATellite (GOSAT), scheduled to be lunched in 2008, is a satellite to monitor tropospheric CO_2 and CH_4 globally from space. The GOSAT main sensor, named Thermal And Near infrared Sensor for carbon Observation (TANSO), is a nadir-looking Fourier Transform Spectrometer (TANSO-FTS) in Short Wavelength InfraRed (SWIR) and thermal infrared region. A retrieval algorithm of greenhouses gases column density from surface scattered solar spectra in SWIR region is developed at NIES. To validate and improve the retrieval algorithm, the direct and ground reflected solar absorption spectra have been observed with the bread board model (BBM) of TANSO FTS installed at Mt. Tsukuba. In situ CO_2 and CH_4 profiles onboard Cessna aircraft have been also measured near surface up to 3 km. The CO_2 concentration was retrieved from the spectra observed for two different geometries with this retrieval algorithm. The retrieved concentration was agreed with that by Cessna in situ measurement within 5 %.

(GOSAT)
(JAXA) (NIES) 2008
CO_2 CH_4
1.6 m 2.0 m ( ) CO_2 CH_4
3 km

NIES CO_2 CH_4
[1]
JAXA GOSAT (Bread Board Model: BBM)

2005 11 17 10
15

1 BBM
(
36.2°N 140.1°E
833m)
BBM 0.76 m O_2
A-band 1.6 m CO_2
CH_4 2.0 m CO_2
0.2 cm^{-1}
1
(
) 4
BBM

( )
3 km CO_2 CH_4

( ) 3 CO_2
CO_2 (
)

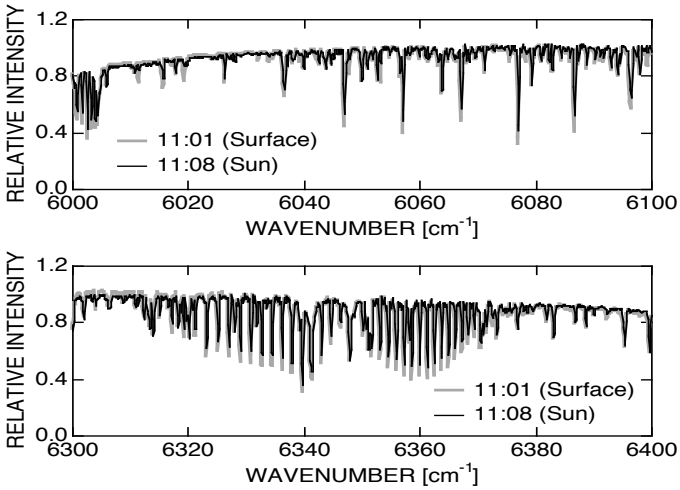
BBM 1
(16 scan)

HITRAN 2004

(1)
CO_2
(2) CO_2

2 (1)
1.6 m

2



2. BBM 1.6 m CH_4 2 3 ( )
CO_2(30012)-(00001) ( ) (1)

BBM

HSTAR

HSTAR[2]

HITRAN 2004 [3]
Kurucz [4]

(0 120 km) 44
2 km 15 ( )
3 km 3 km 30 km (2005/11/17) 9:00
( )
CO_2 3 km 380
ppmv CH_4 3 km 1.7 ppmv
exponential ( )

geometry BBM

$0.01cm^{-1}$ BBM
BBM
BBM
CO_2 5%

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