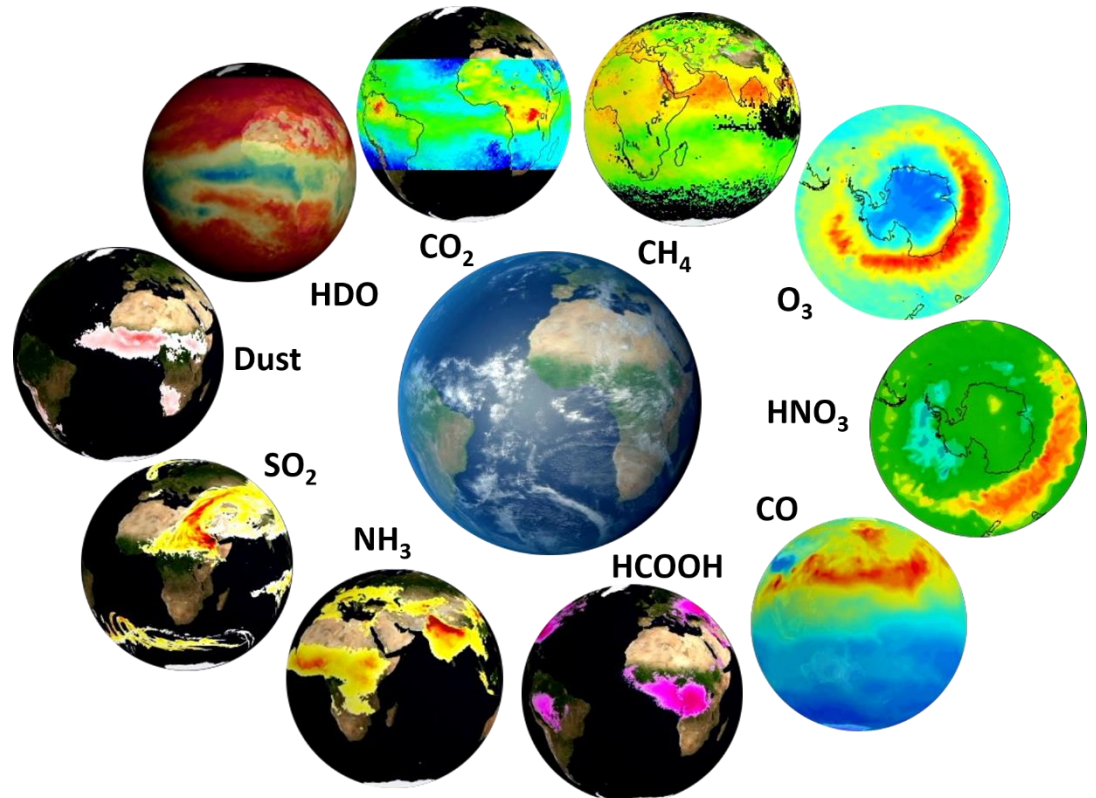
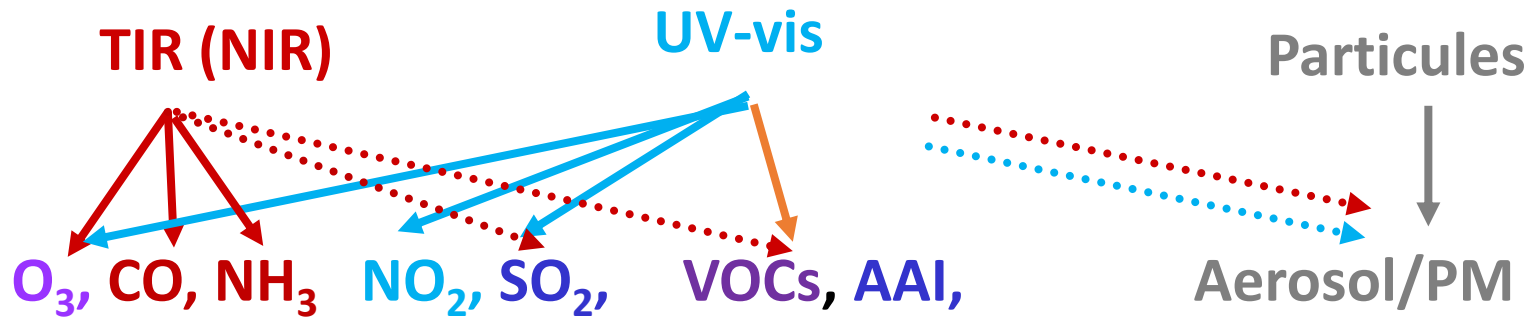


Role of IR observations in AQ constellation



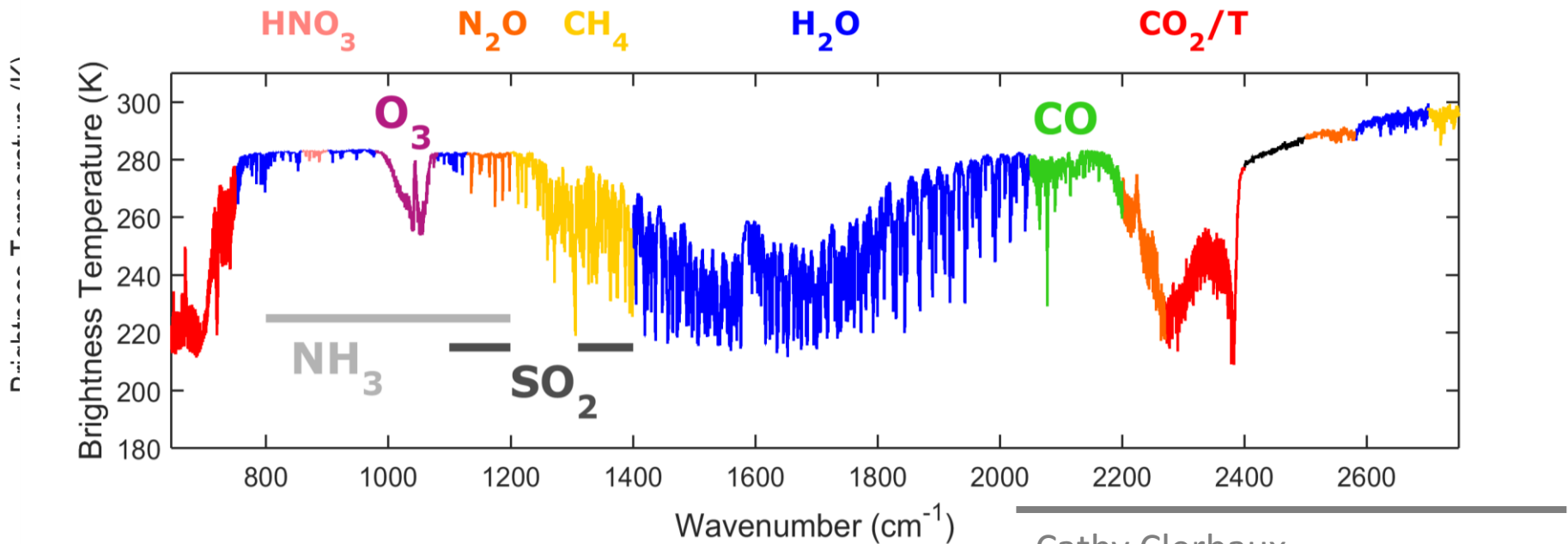
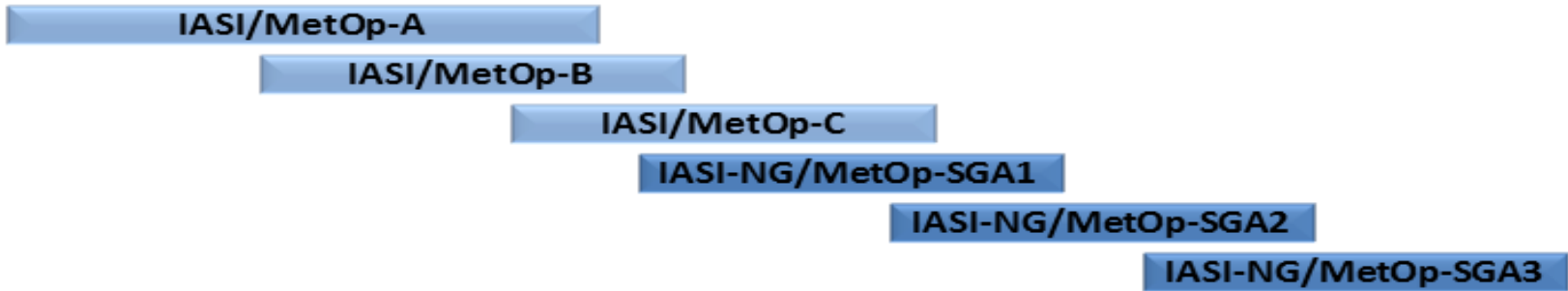
Cathy Clerbaux
and the LATMOS/ULB teams

Current and future sounders available (in the EU)



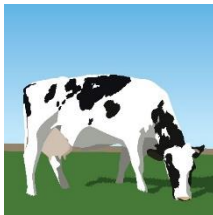
EU sat	Satellite	TIR	NIR	UV-vis	Aerosols
NOW	MetOp	IASI		GOME2	-
Future Polar			TROPOMI		
Future Polar	MetOp-SG	IASI-NG		S5- UVS	MetImage, 3MI
Future Geo	MTG	IRS		S4- UVN	

IASI and IASI-NG time coverage



Cathy Clerbaux

IASI/ MetOp

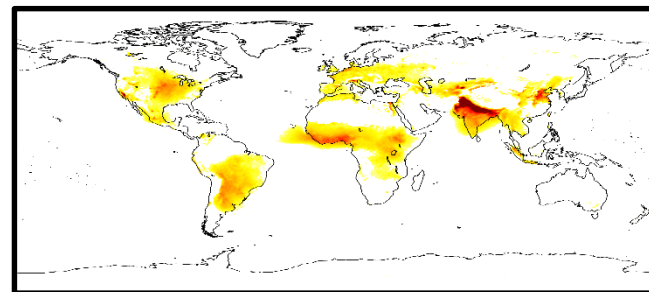
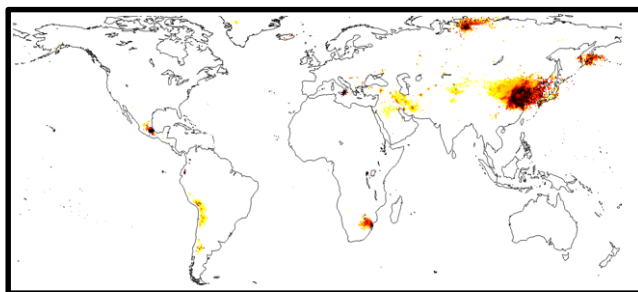
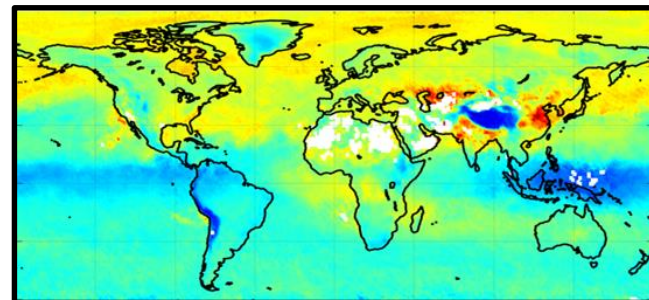
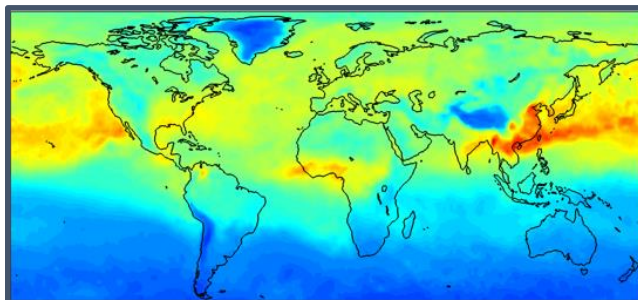


CO O₃ NH₃ SO₂

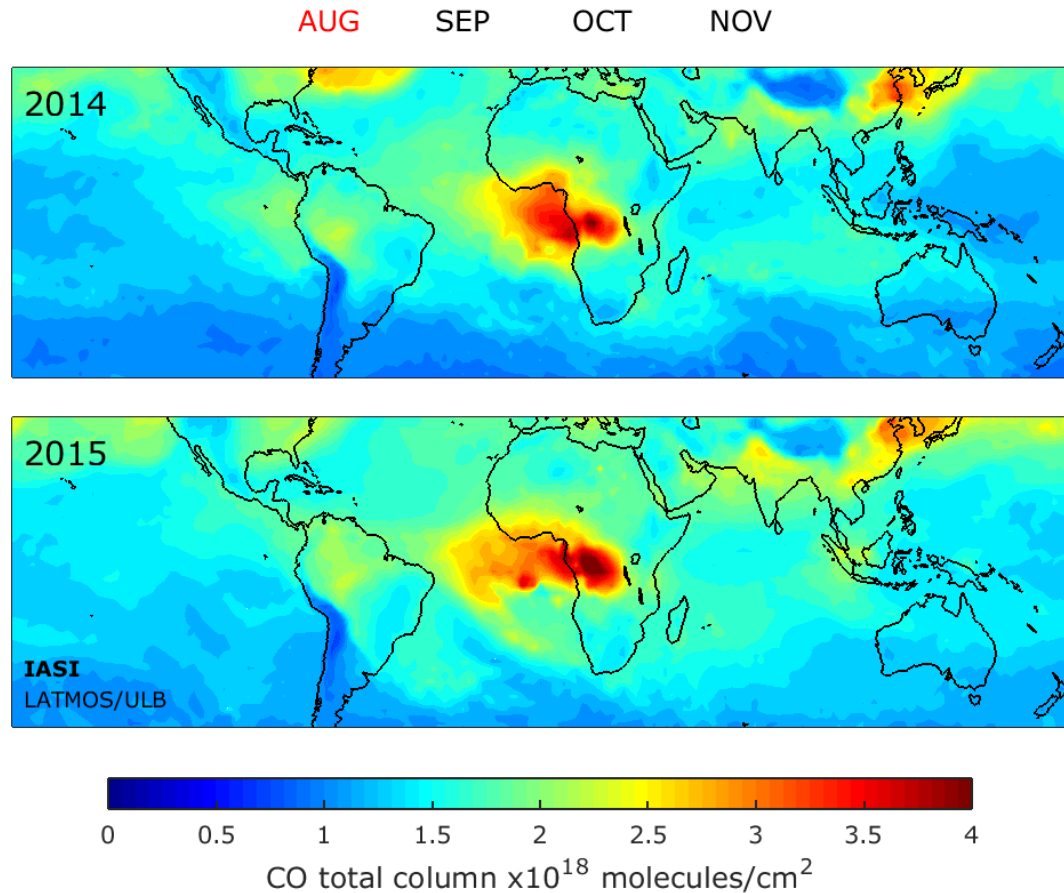
H₂O CH₄ (N₂O) CO₂

HNO₃ HDO

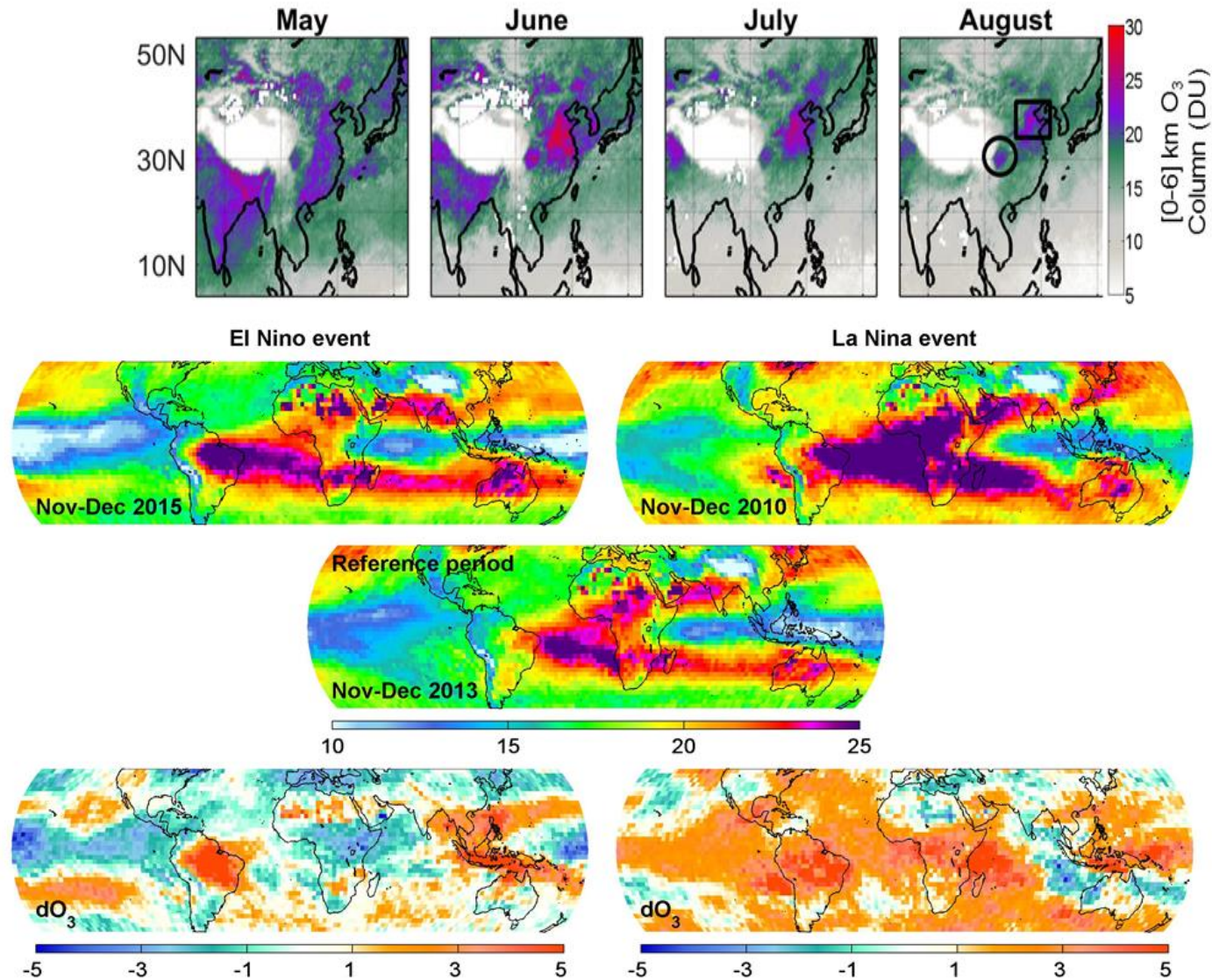
PAN HONO C₄H₄O
C₂H₂ C₂H₄ C₃H₆
CH₃OH HCOOH
CH₃COOH CH₃CHO
CFC-11 CHC-12
HCN OCS H₂S
+ dust/ash



Carbon monoxide as observed by IASI during the recent El Niño event

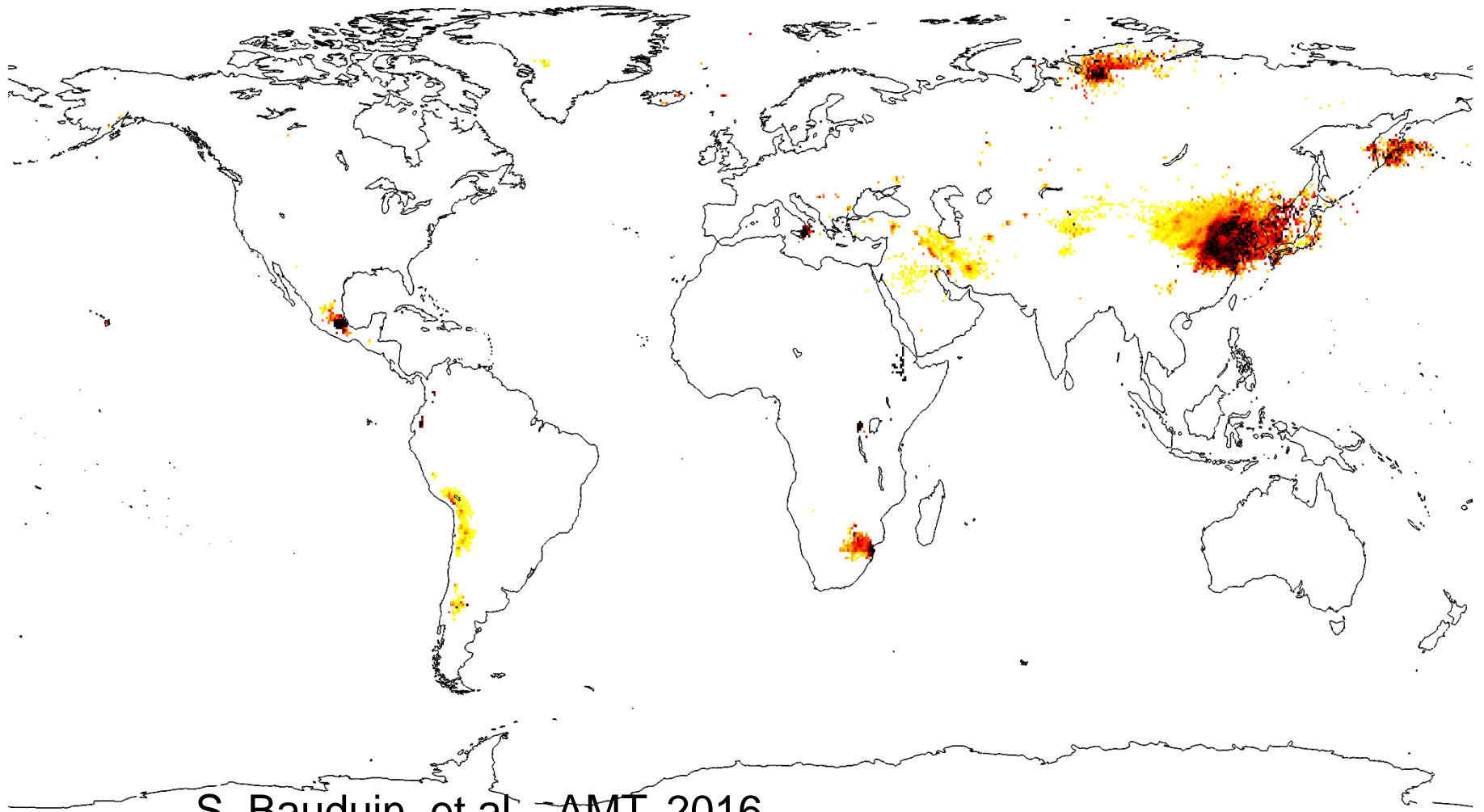


Ozone as observed by IASI during the monsoon and El Nino



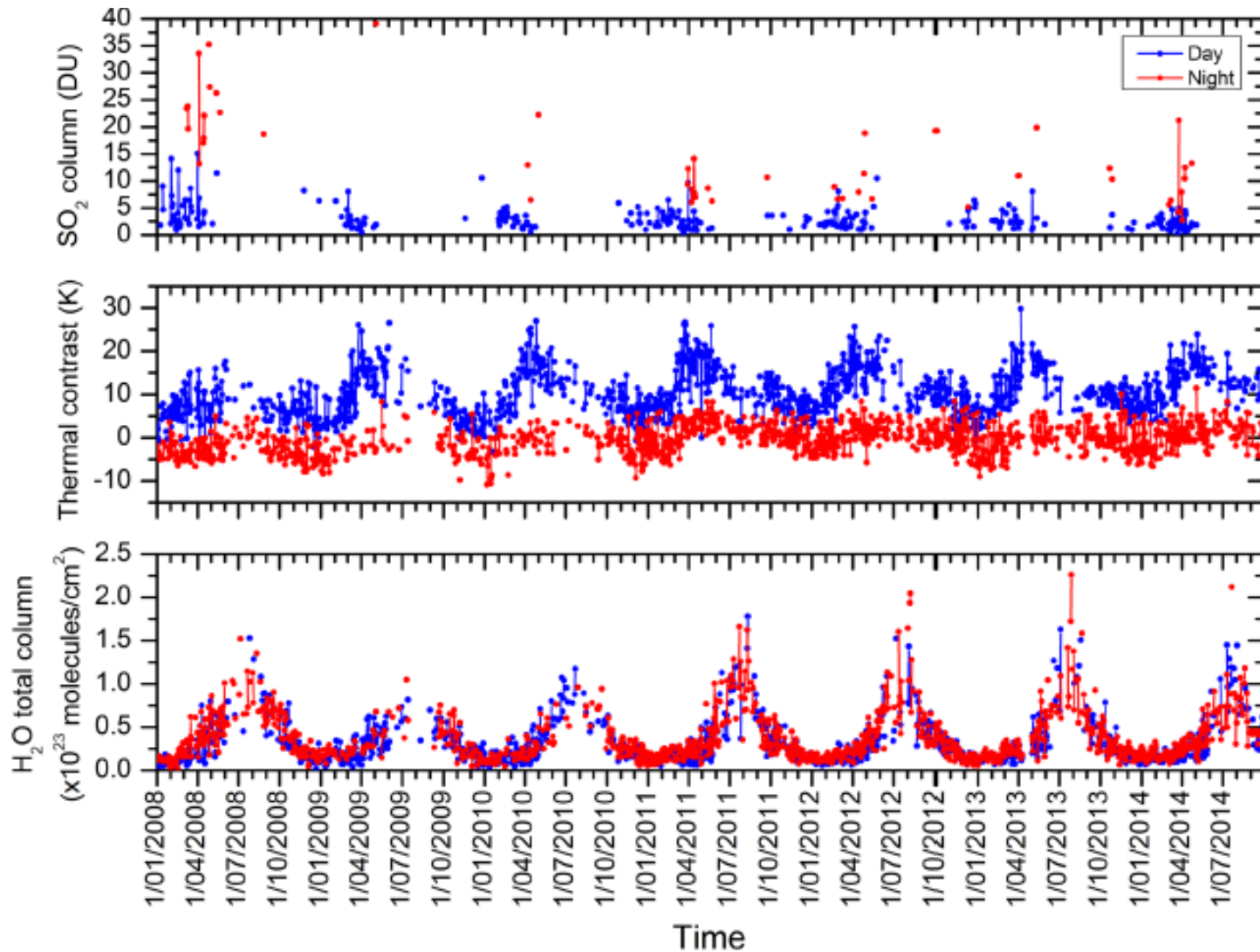
Safieddine et al., AMT, 2016
Wespes et al., JGR, submitted

IASI sulfur dioxide (SO₂) - 7 years (2008-2014)



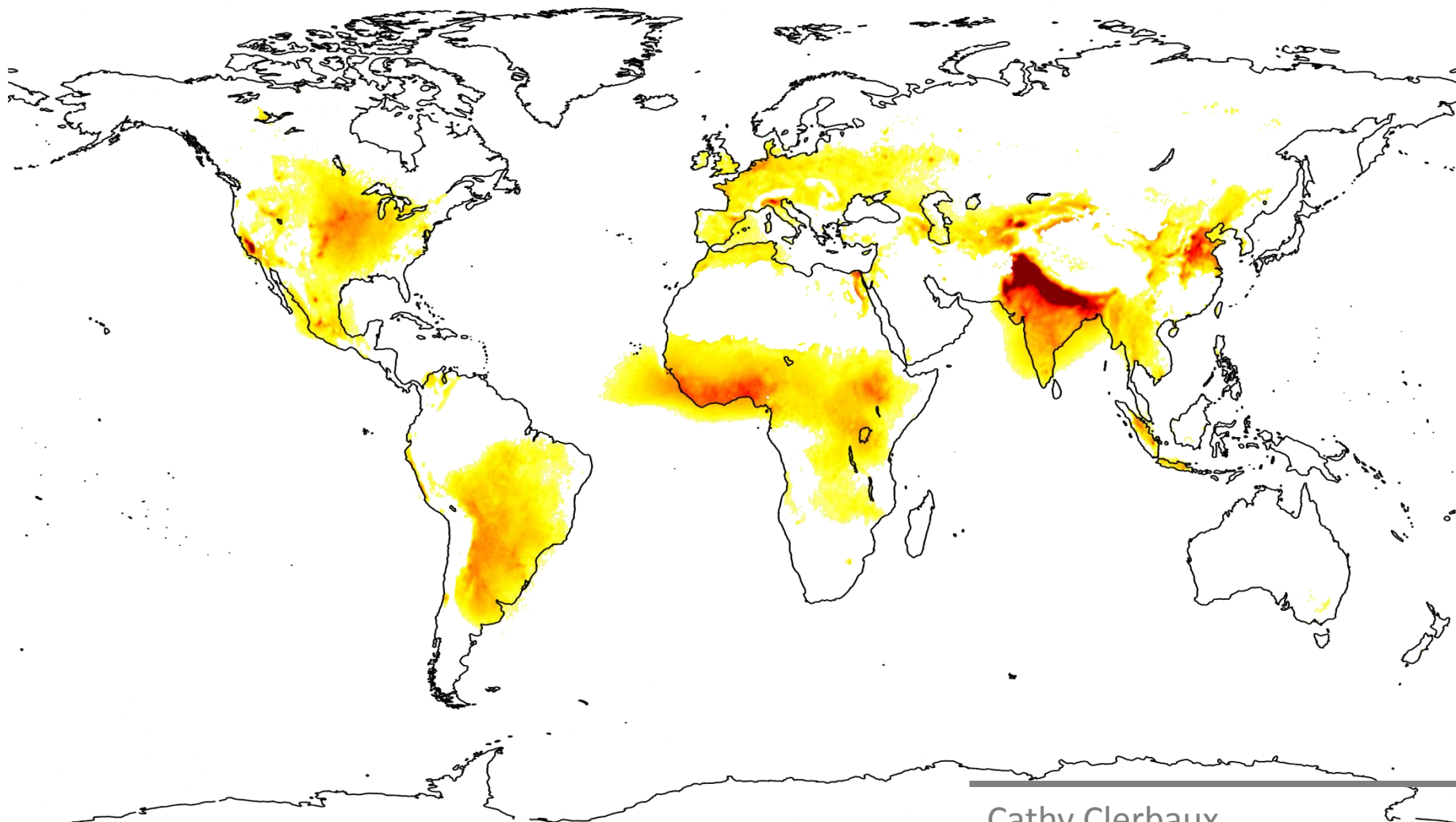
S. Bauduin et al. , AMT, 2016.

IASI SO₂ Beijing - 7 years (2008-2014)



S. Bauduin et al. , AMT, 2016.

IASI ammonia (NH_3) 7 years (2008-2014)



Cathy Clerbaux

IASI NH₃ - emission inventories

Total columns from IASI

vs

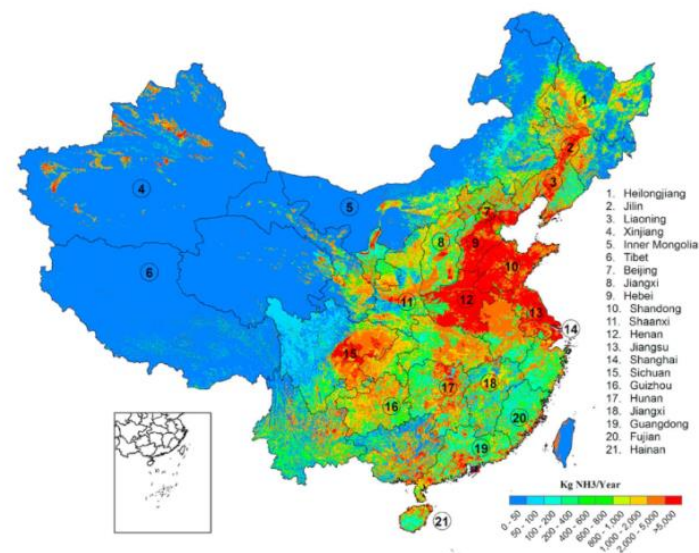
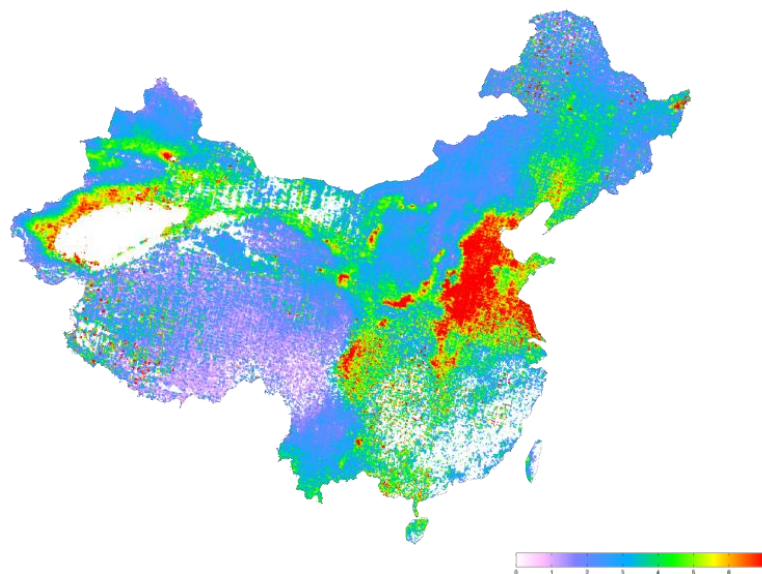
NH₃ emission inventory from Huang

0.05°x0.05° grid (mg/m²)

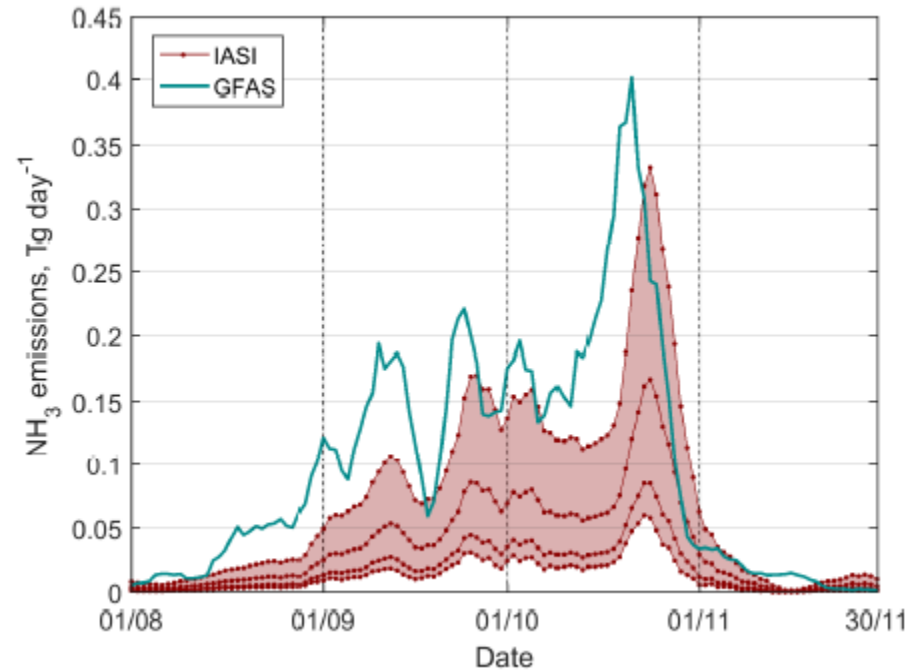
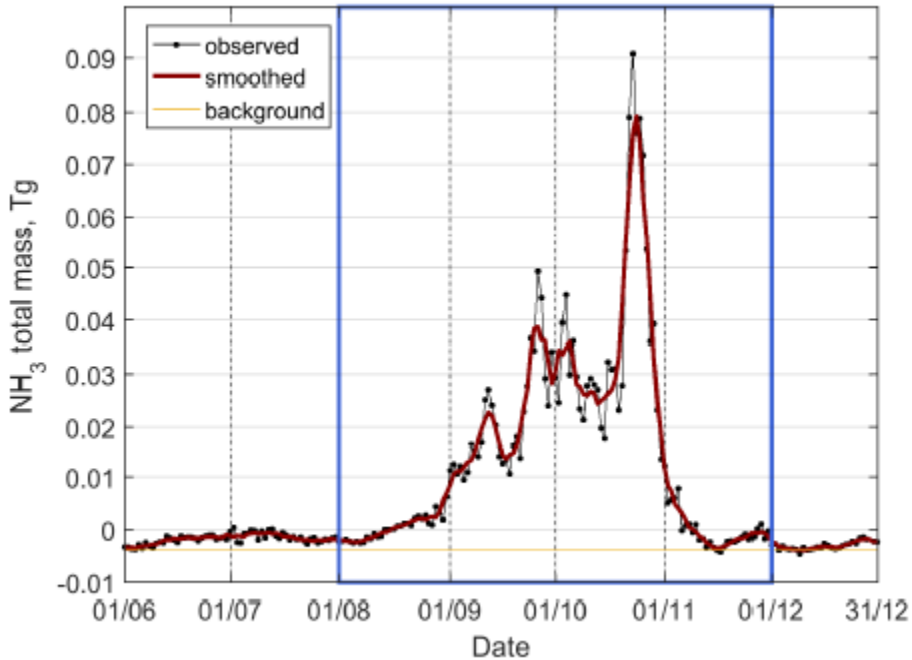
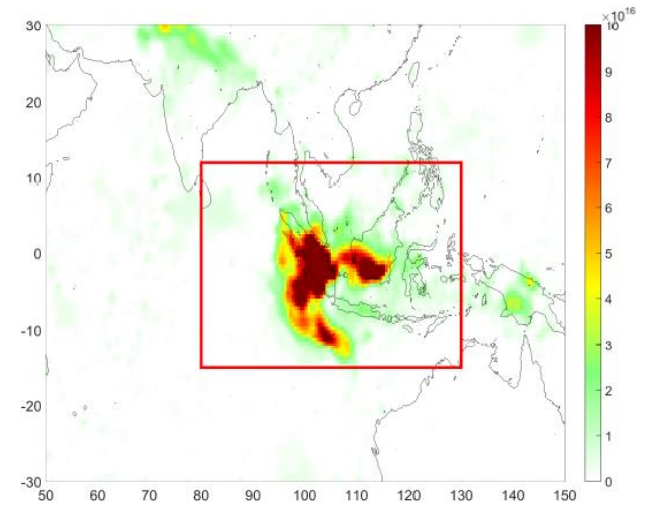
(Van Damme *et al.*, ACP 2014)

NH₃ emission in 1 km grid cell (kg/yr) (Huang *et al.*, GBC

2012)



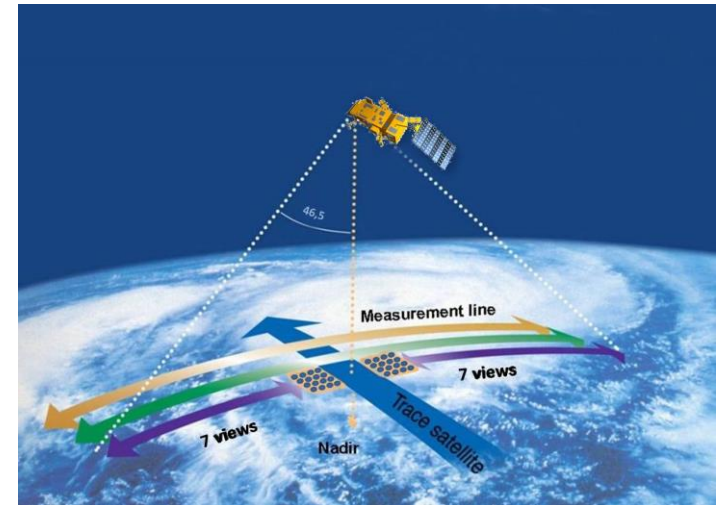
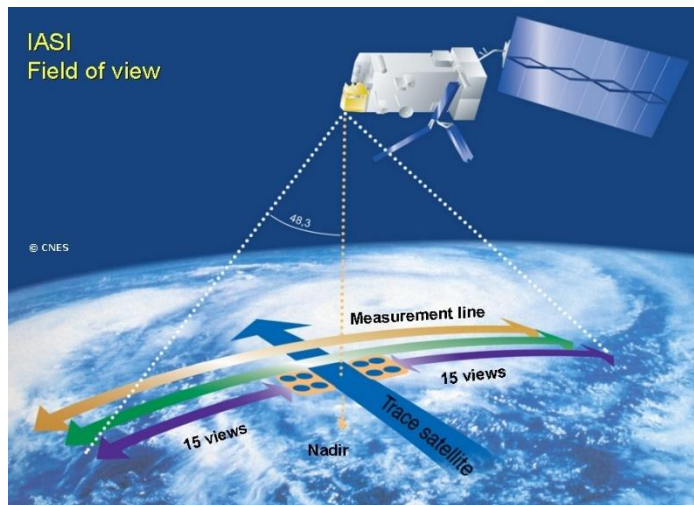
IASI ammonia (NH_3), October 25, 2015



S. Whitburn et al. , GRL, 2016.

Future mission : IASI-new generation

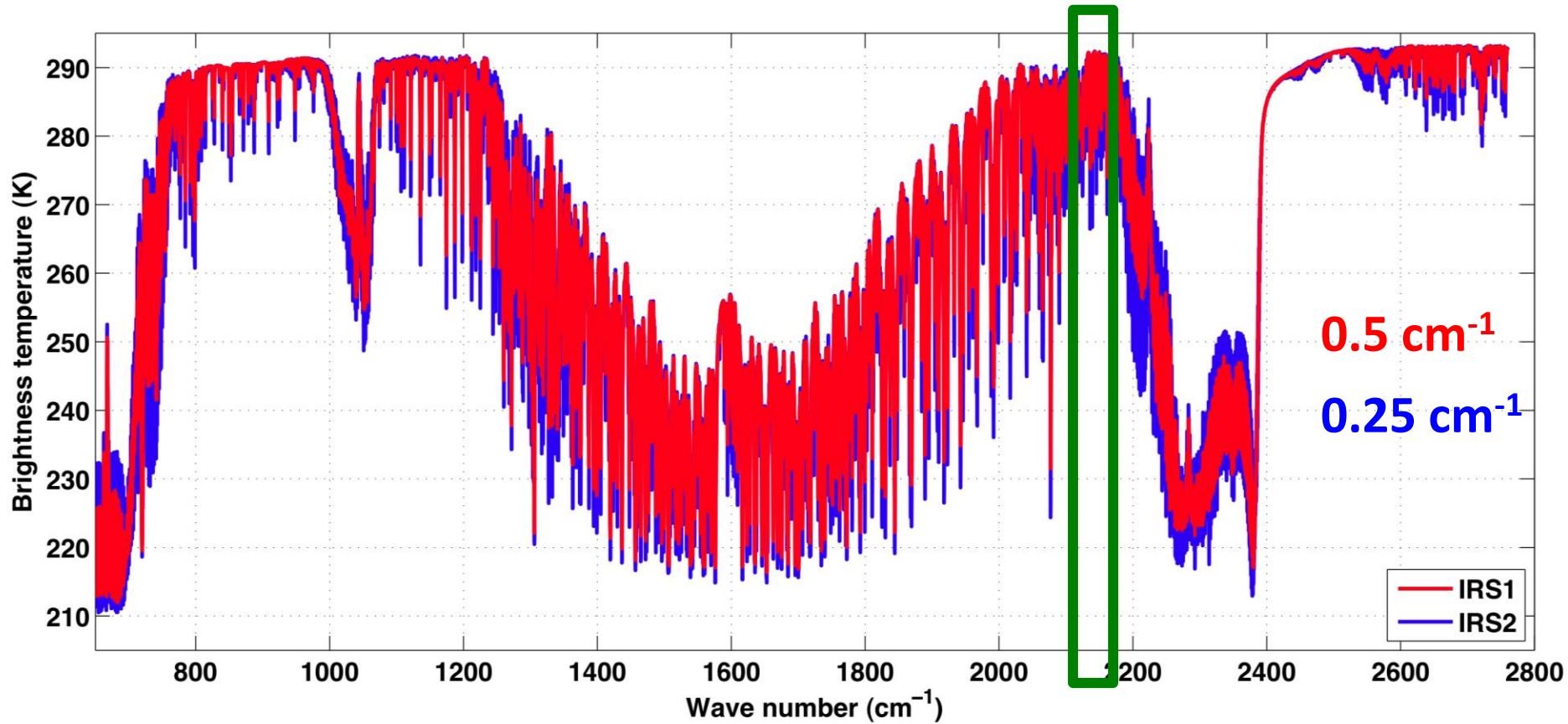
Signal/noise \leftrightarrow Spectral resolution \leftrightarrow Pixel size



IASI and IASI-NG spectrum

Averaged over the whole tropical TIGR situations

Computation with the 4A/OP RT code, using the GEISA-11 spectroscopic database



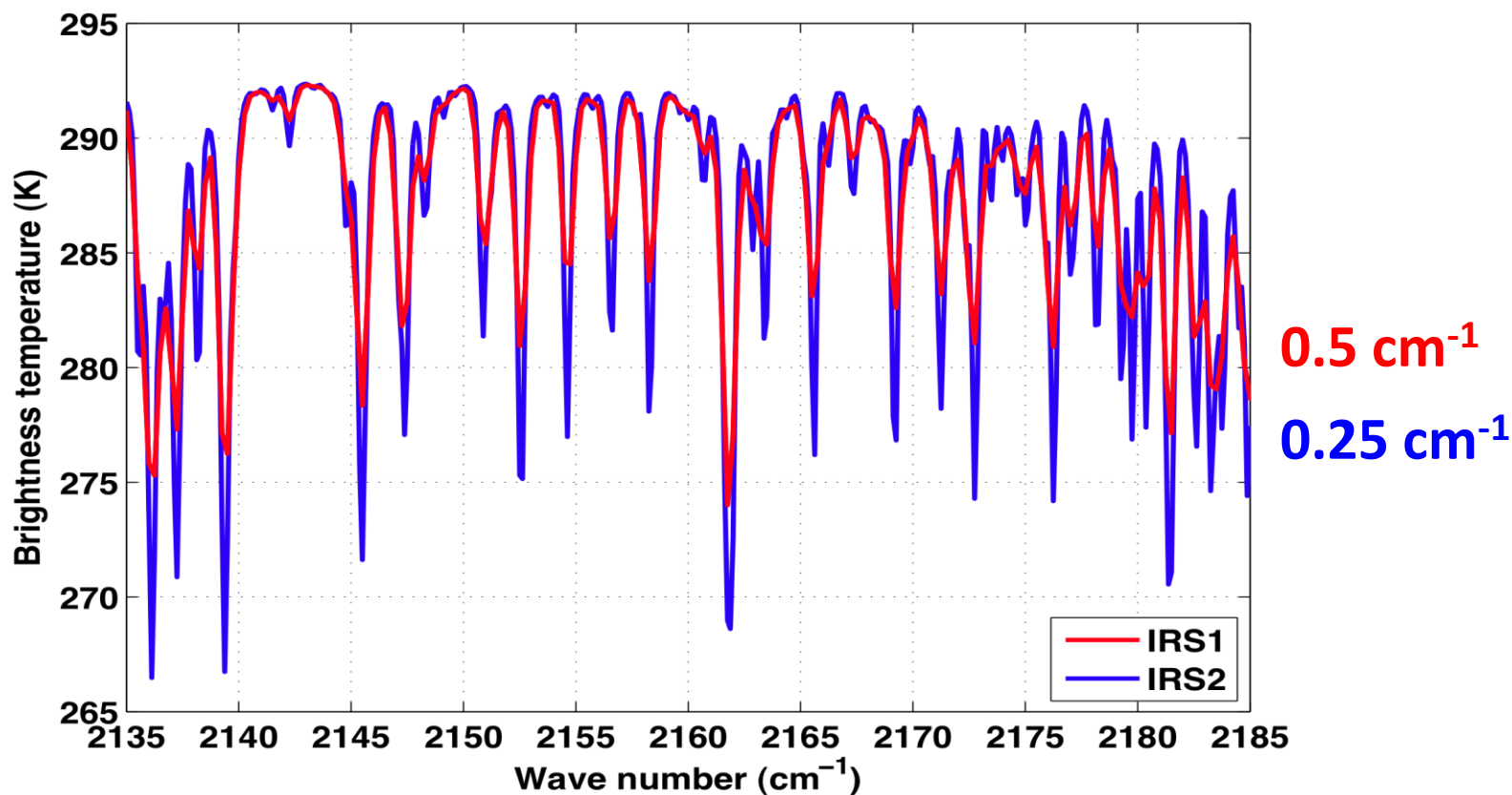
Courtesy Cyril Crevoisier (LMD)

IASI-NG (IASI-New Generation)

IASI and IASI-NG spectrum

Averaged over the whole tropical TIGR situations

Computation with the 4A/OP RT code, using the GEISA-11 spectroscopic database



Courtesy Cyril Crevoisier (LMD)

Expected improvement with IASI-NG



	IASI		IASI-NG		
Chemistry	DOFs	Error (%)	DOFs	Error (%)	What the 'NG' brings
O ₃	3-4	PBL : 60% Tropo : 11%	4-5	PBL : 40% Tropo : 8%	More information in PBL
CO	1-2	PBL : 16%	2-3	PBL : 10%	More information in PBL
HNO ₃					nd strato
NH ₃ ^a					tal noise
Methano					tal noise
C ₂ H ₄ ^a					tal noise
SO ₂ -volcar					the plume
Climate	Towards IASI-New Generation (IASI-NG): impact of improved spectral resolution and radiometric noise on the retrieval of thermodynamic, chemistry and climate variables				G' brings
H ₂ O					ed by 1.5
T					ERROR improved by 2.5
CO ₂	1 or less	~1%	1-2	<1%	Low troposphere
CH ₄	1 or less	~3%	1-2		Less interferences
N ₂ O	detected	-	measured	-	
Aerosols	dust				More types
Emissivity		0,04 @4μm		0,02 @4μm	

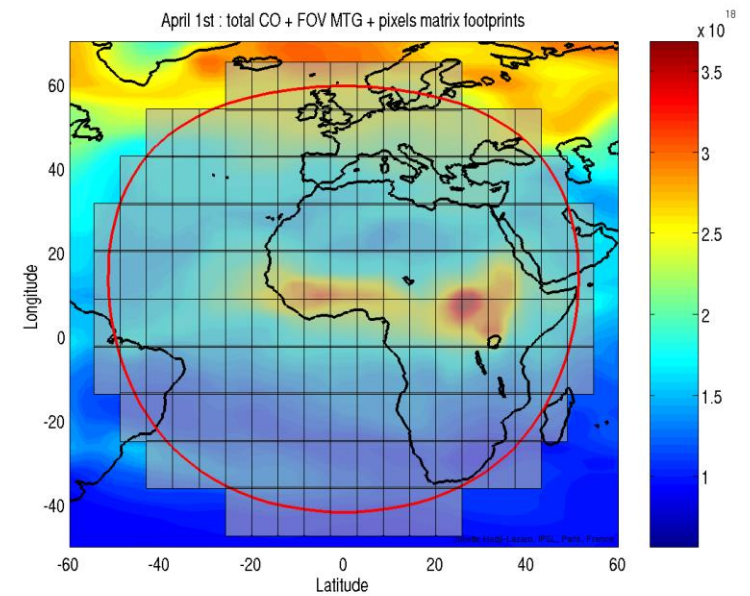
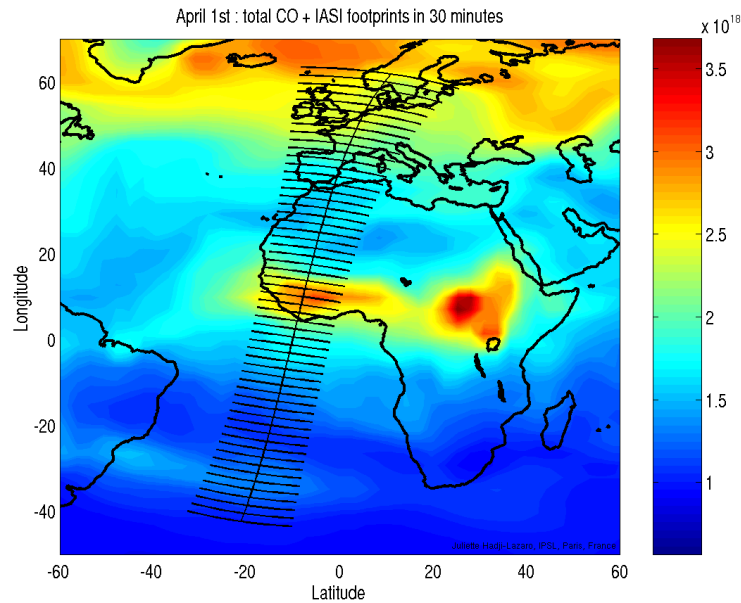
Atmos. Meas. Tech., 7, 4367–4385, 2014
www.atmos-meas-tech.net/7/4367/2014/
 doi:10.5194/amt-7-4367-2014
 © Author(s) 2014. CC Attribution 3.0 License.



Towards IASI-New Generation (IASI-NG): impact of improved spectral resolution and radiometric noise on the retrieval of thermodynamic, chemistry and climate variables

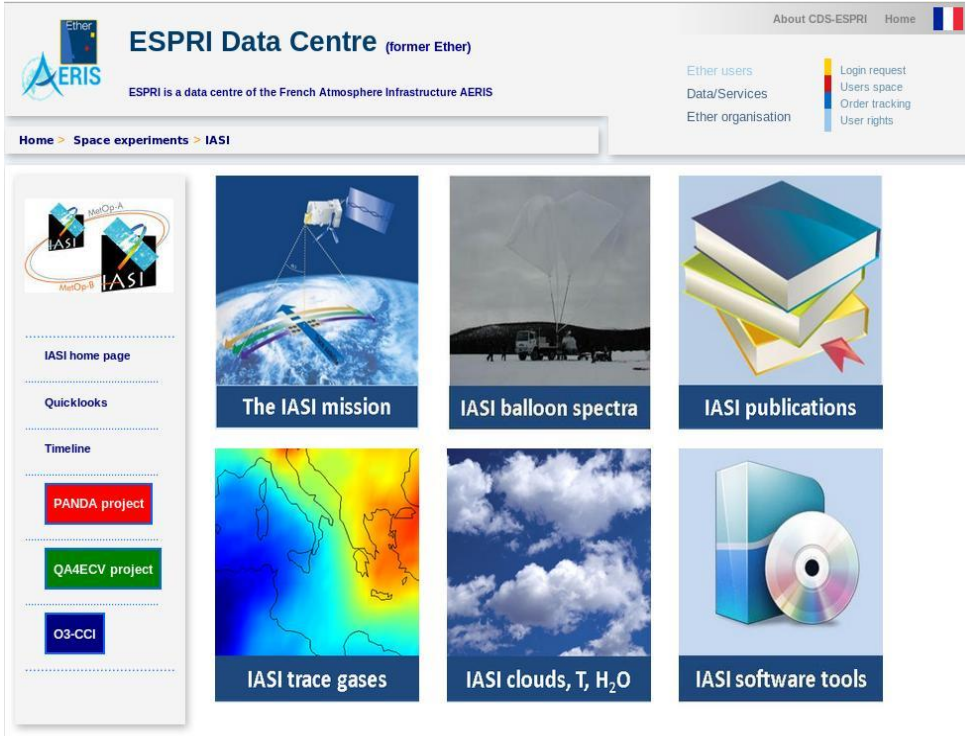
C. Crevoisier¹, C. Clerbaux², V. Guidard³, T. Phulpin⁴, R. Armante¹, B. Barret⁵, C. Camy-Peyret⁶, J.-P. Chaboureaud⁵, P.-F. Coheur⁷, L. Crépeau¹, G. Dufour⁸, L. Labonnote⁹, L. Lavanant¹⁰, J. Hadji-Lazaro², H. Herbin⁹, N. Jacquinet-Husson¹¹, S. Payan², E. Péquignot⁴, C. Pierangelo⁴, P. Sellitto^{8,4}, and C. Stubenrauch¹

Future mission : IRS/MTG



Signal/noise \leftrightarrow Spectral resolution \leftrightarrow Pixel size

AERIS web portal



ESPRI Data Centre (former Ether)

ESPRI is a data centre of the French Atmosphere Infrastructure AERIS

Home > Space experiments > IASI

IASI home page

Quicklooks

Timeline

PANDA project

QA4ECV project

O3-CCI

The IASI mission

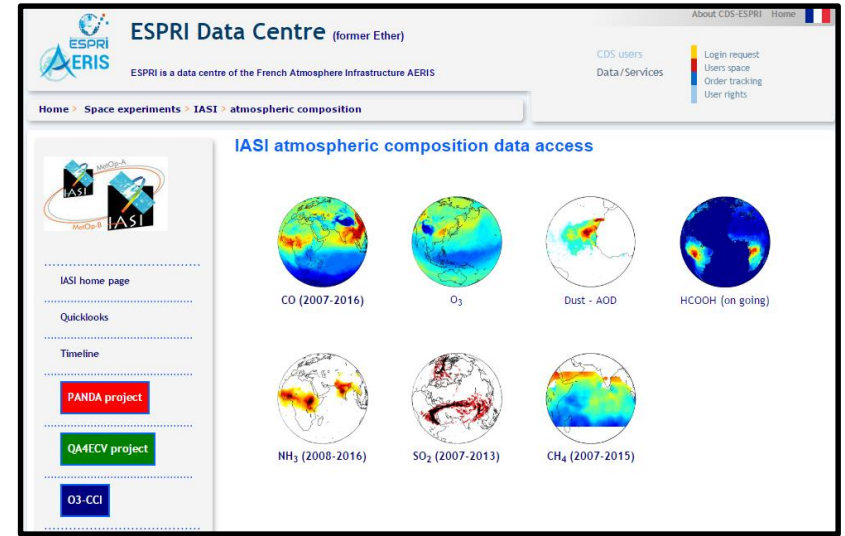
IASI balloon spectra

IASI publications

IASI trace gases

IASI clouds, T, H₂O

IASI software tools



ESPRI Data Centre (former Ether)

ESPRI is a data centre of the French Atmosphere Infrastructure AERIS

Home > Space experiments > IASI > atmospheric composition

IASI atmospheric composition data access

CO (2007-2016)

O₃

Dust - AOD

HCOOH (on going)

NH₃ (2008-2016)

SO₂ (2007-2013)

CH₄ (2007-2015)

IASI home page

Quicklooks

Timeline

PANDA project

QA4ECV project

O3-CCI

Select a day in the calendar to access to CO Iasi data : day in blue = full data, day in grey = no data.

January 2016							February 2016							March 2016							April 2016						
Su	Mo	Tu	We	Th	Fr	Sa	Su	Mo	Tu	We	Th	Fr	Sa	Su	Mo	Tu	We	Th	Fr	Sa	Su	Mo	Tu	We	Th	Fr	Sa
						1	2																				
3	4	5	6	7	8	9	7	8	9	10	11	12	13	6	7	8	9	10	11	12	3	4	5	6	7	8	9
10	11	12	13	14	15	16	14	15	16	17	18	19	20	13	14	15	16	17	18	19	10	11	12	13	14	15	16
17	18	19	20	21	22	23	21	22	23	24	25	26	27	20	21	22	23	24	25	26	17	18	19	20	21	22	23
24	25	26	27	28	29	30	28	29						27	28	29	30	31			24	25	26	27	28	29	30
31																											

May 2016							June 2016							July 2016							August 2016						
Su	Mo	Tu	We	Th	Fr	Sa	Su	Mo	Tu	We	Th	Fr	Sa	Su	Mo	Tu	We	Th	Fr	Sa	Su	Mo	Tu	We	Th	Fr	Sa
1	2	3	4	5	6	7	5	6	7	8	9	10	11	3	4	5	6	7	8	9	7	8	9	10	11	12	13
8	9	10	11	12	13	14	12	13	14	15	16	17	18	10	11	12	13	14	15	16	14	15	16	17	18	19	20
15	16	17	18	19	20	21	19	20	21	22	23	24	25	17	18	19	20	21	22	23	17	18	19	20	21	22	23
22	23	24	25	26	27	28	26	27	28	29	30			24	25	26	27	28	29	30	28	29	30	31			
29	30	31												31													

September 2016							October 2016							November 2016							December 2016						
Su	Mo	Tu	We	Th	Fr	Sa	Su	Mo	Tu	We	Th	Fr	Sa	Su	Mo	Tu	We	Th	Fr	Sa	Su	Mo	Tu	We	Th	Fr	Sa
1	2	3	4	5	6	7	1	2	3	4	5	6	1	2	3	4	5	6	1	2	3	4	5	6			
8	9	10	11	12	13	14	8	9	10	11	12	13	8	9	10	11	12	13	8	9	10	11	12	13			
15	16	17	18	19	20	21	15	16	17	18	19	20	15	16	17	18	19	20	15	16	17	18	19	20			
22	23	24	25	26	27	28	22	23	24	25	26	27	22	23	24	25	26	27	22	23	24	25	26	27			
29	30	31					29	30	31					29	30	31					29	30	31				

QUICKLOOKS - DAILY

Satellite: MetOp-B Projection: Global Species: CO Date: 2016-04-03

IASI Total CO (day) 2016/04/03

Source: LATHOS-USB/030403/MetOp-B Ether/Production

<http://www.pole-ether.fr>

Operational distribution at Eumetsat (2016 – 2020)

