

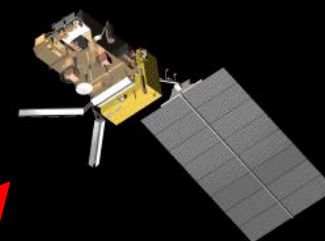
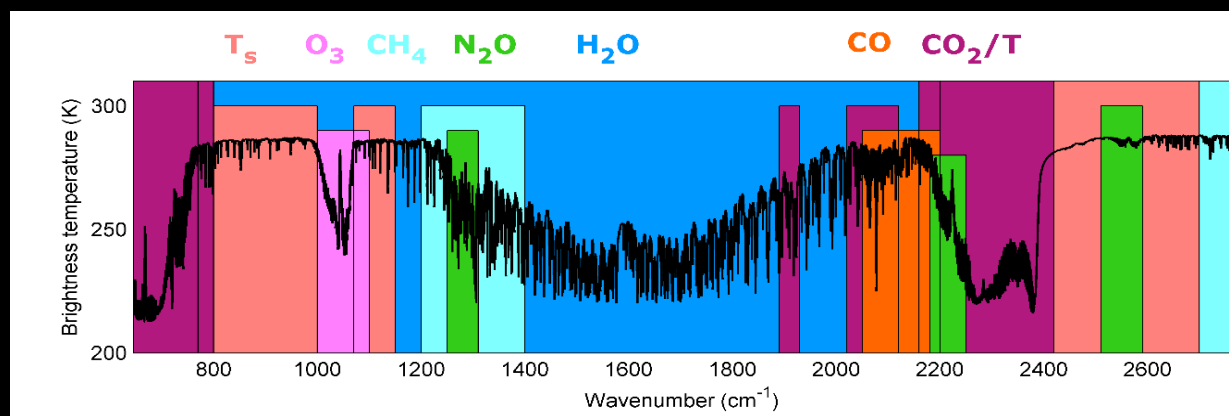
What can be seen by the IASI infrared satellite-borne instruments in the Asian monsoon region?



Cathy Clerbaux,
S. Safieddine, A. Boynard,
J. Hadji-Lazaro, M. George,
D. Hurthmans, P.-F Coheur

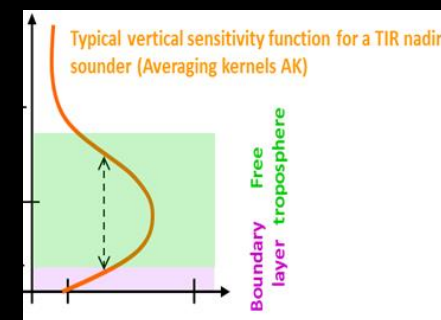
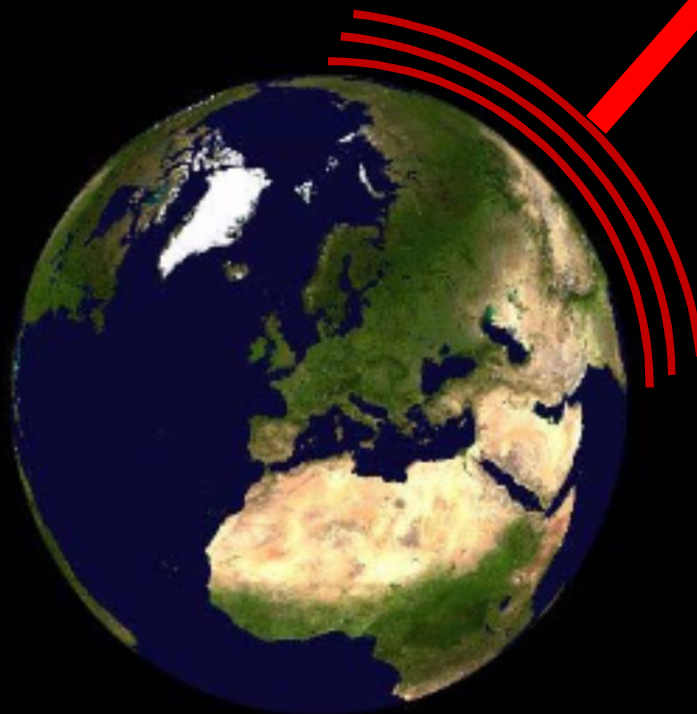
LATMOS/CNRS (Paris)
CQP (ULB, Brussels)

What can be seen by IASI?



H_2O CH_4 CO_2
 O_3 CO SO_2
 HNO_3 HDO NH_3

PAN HONO C_4H_4O
 C_2H_2 C_2H_4 C_3H_6
 CH_3OH $HCOOH$
 CH_3COOH CH_3CHO
CFC-11 CHC-12
HCN OCS H_2S
+ particules



IASI/MetOp-A launched in 2006
IASI/MetOp-B launched in 2012
Pixel size 12km, global coverage
Spectral res 0.5 cm⁻¹

~ 13,500 interferograms /15 min

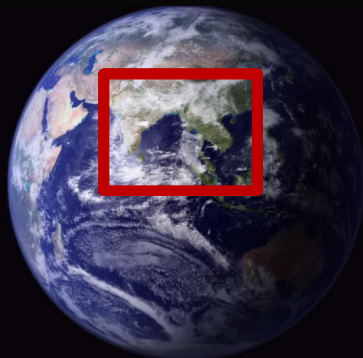
3 cases studies with IASI



North China Plain (CO and SO₂)
January 2013



India (ozone)
April-May 2015



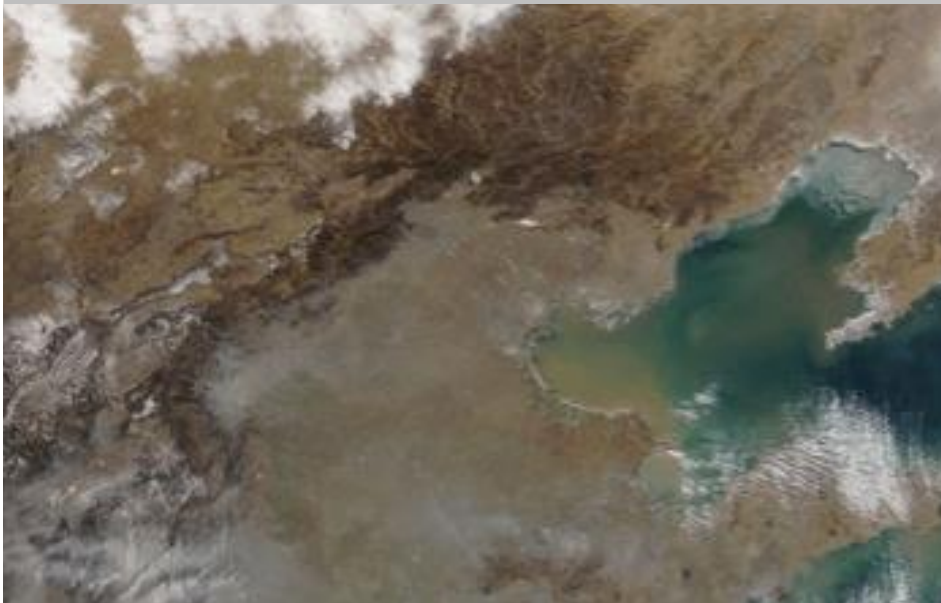
East summer monsoon (ozone)
May-August

3 cases studies with IASI

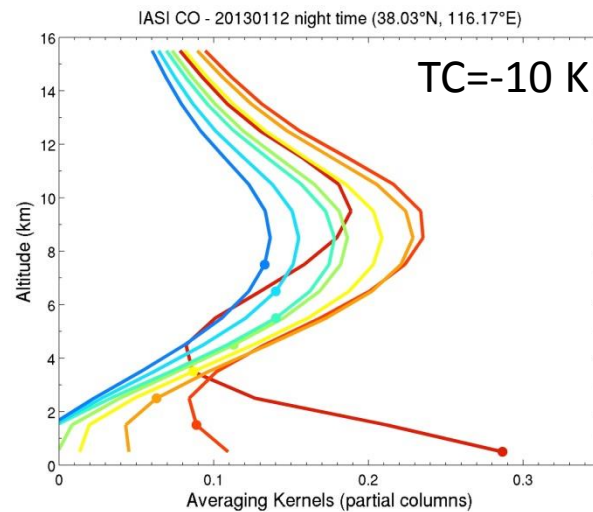
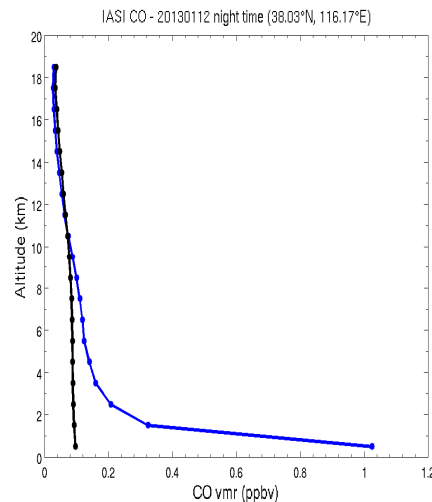
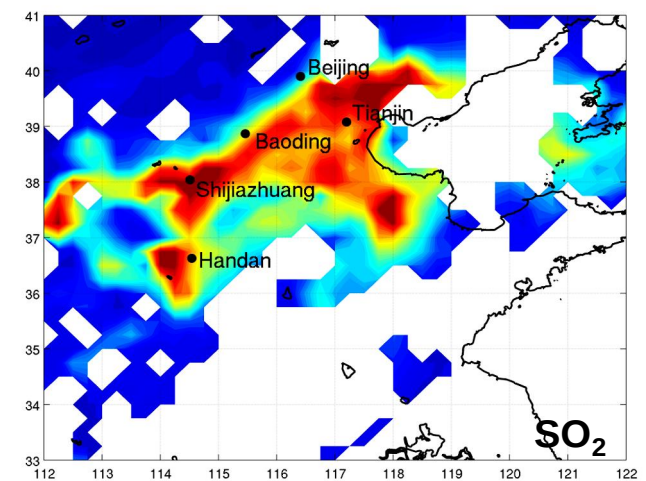
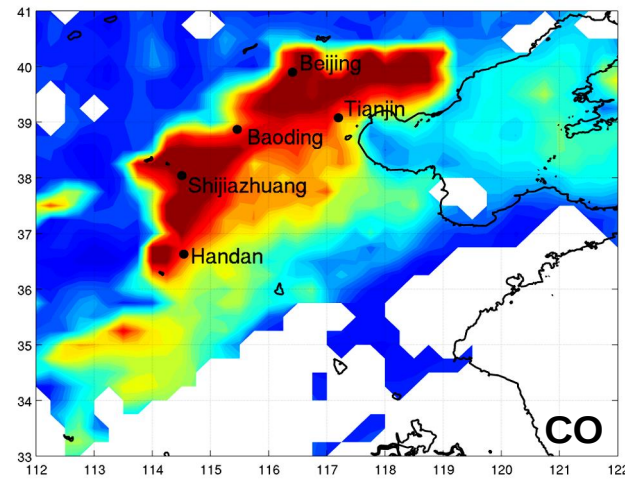
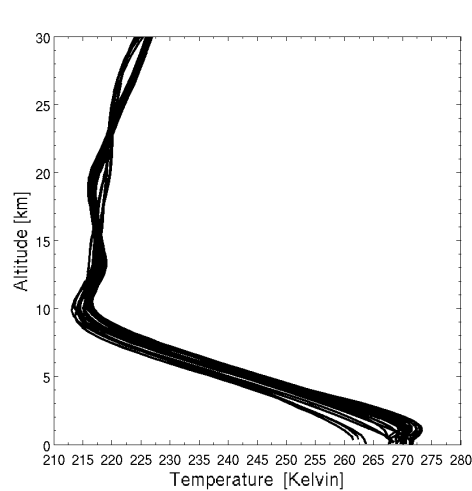


North China Plain (CO and SO₂)
January 2013

China : January 2013



CO and SO₂: January 2013



high thermal contrast
=> high IASI sensitivity at
the surface
combined with high CO
and SO₂ concentrations
⇒ IASI detects pollutants
in the PBL

3 cases studies with IASI

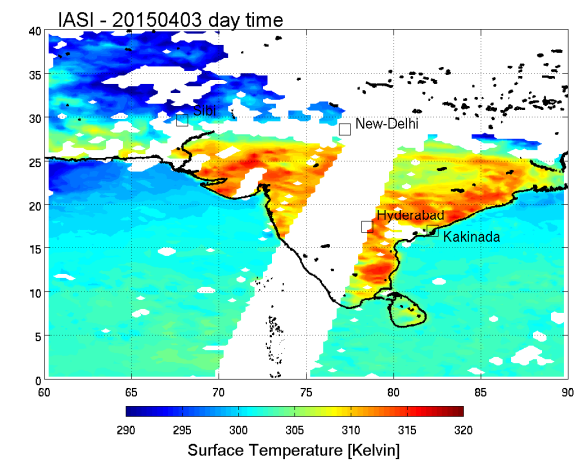
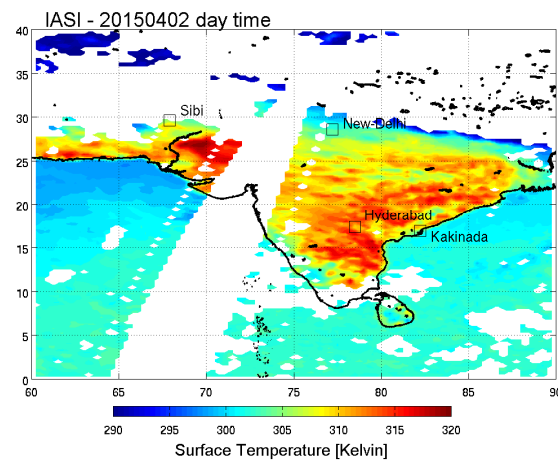
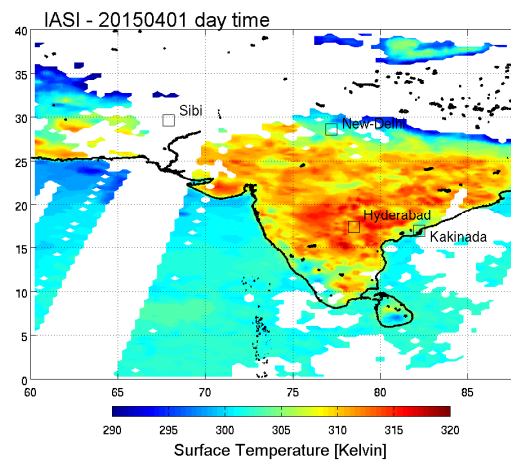


India (ozone)
April-May 2015

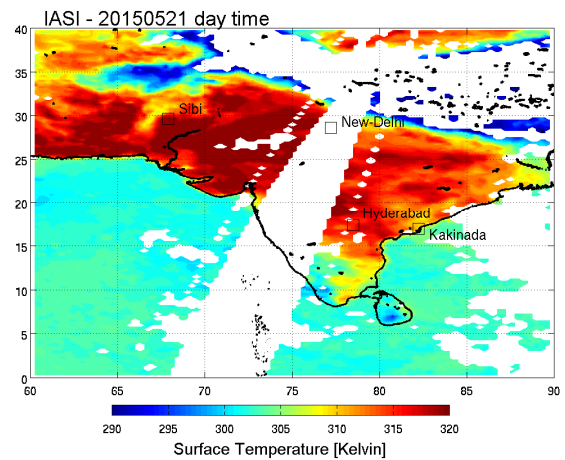
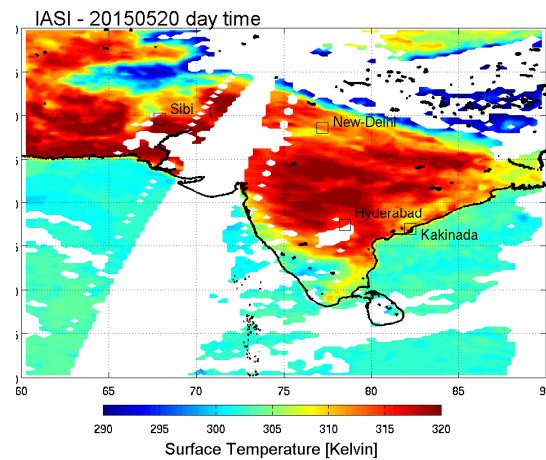
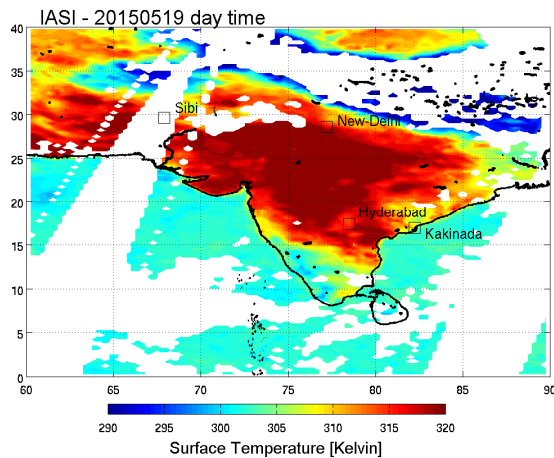
India : April - May 2015

IASI Surface Temperature

APRIL



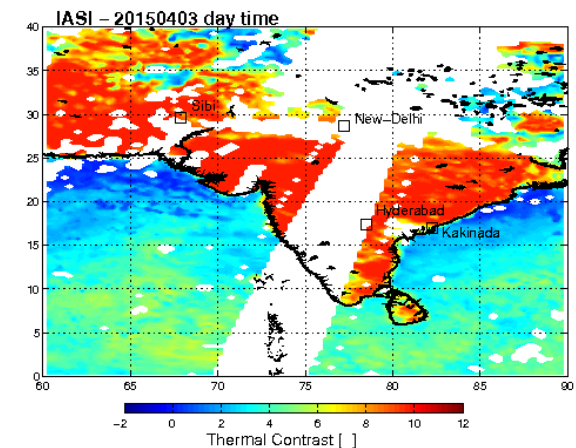
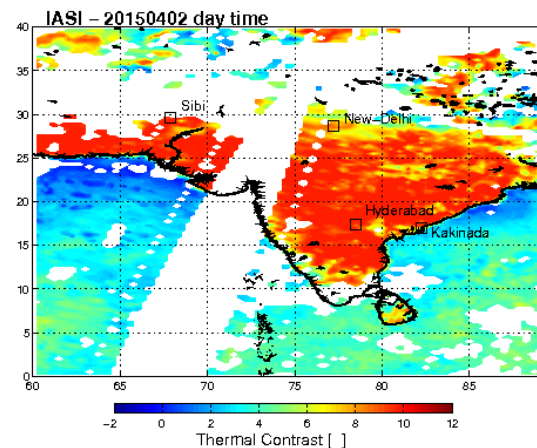
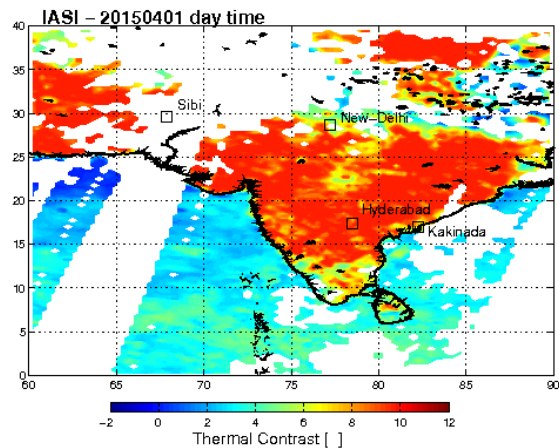
MAY



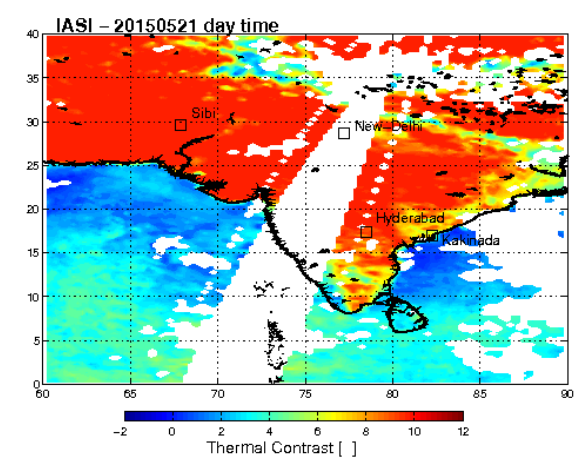
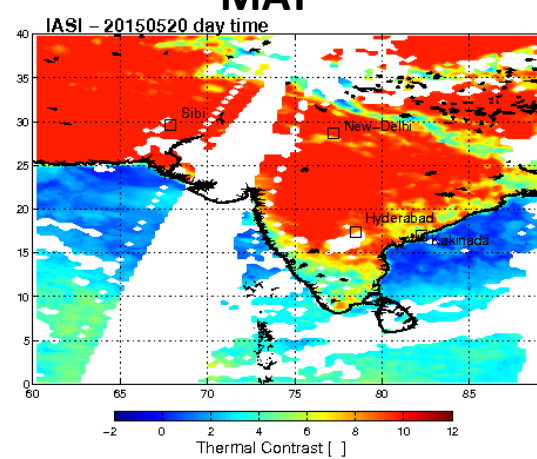
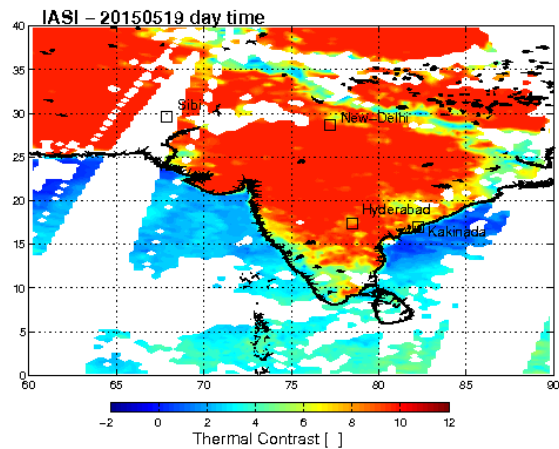
Credit A. Boynard 2015

India : April - May 2015

Thermal contrast APRIL



MAY

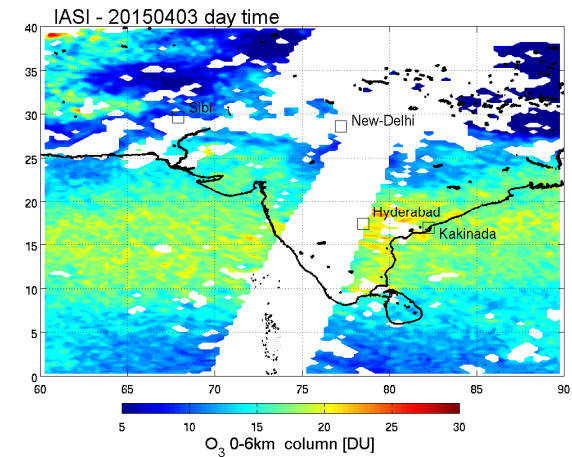
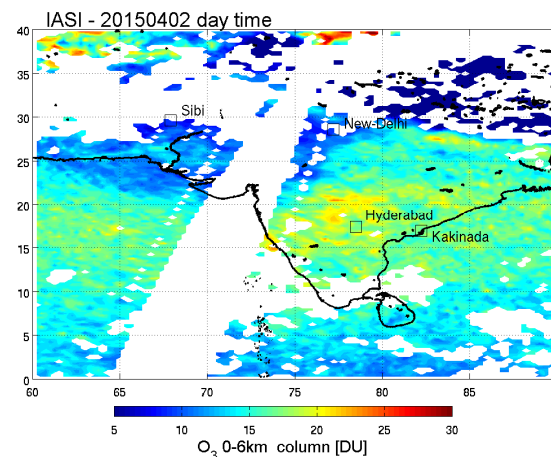
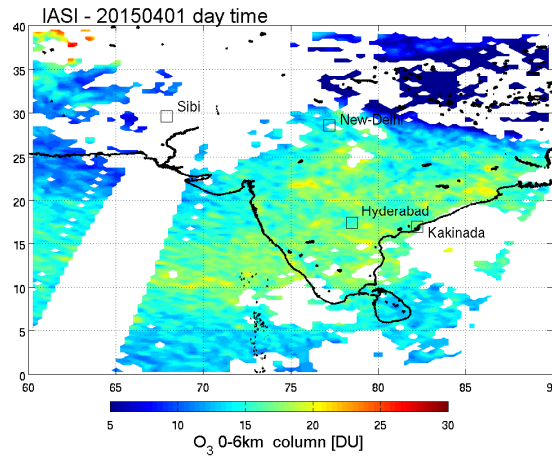


Credit A. Boynard 2015

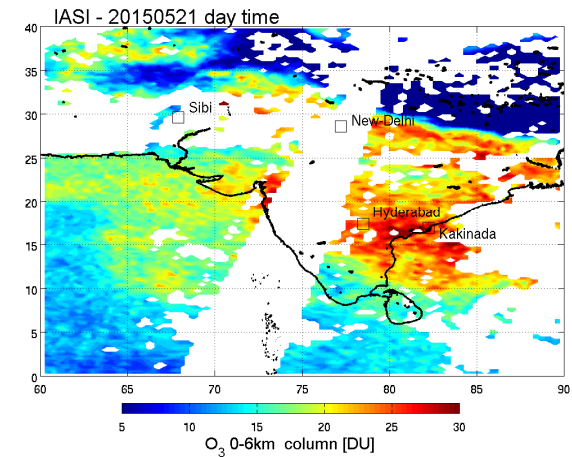
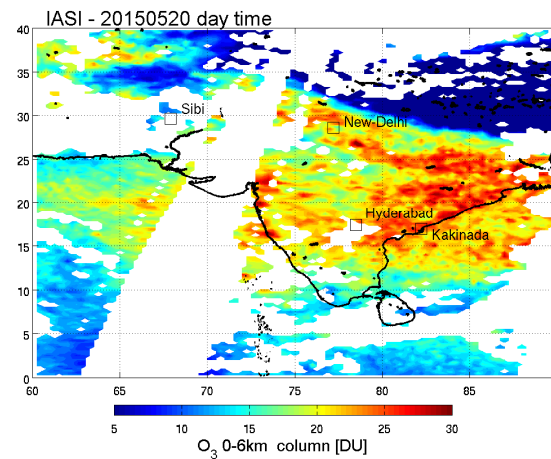
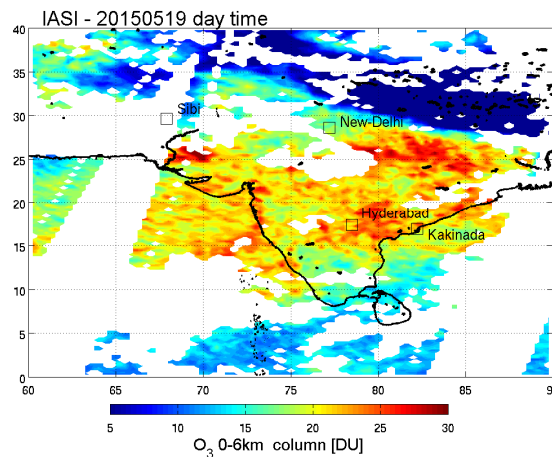
India : April - May 2015

IASI Surface-6km Ozone Column

APRIL



MAY



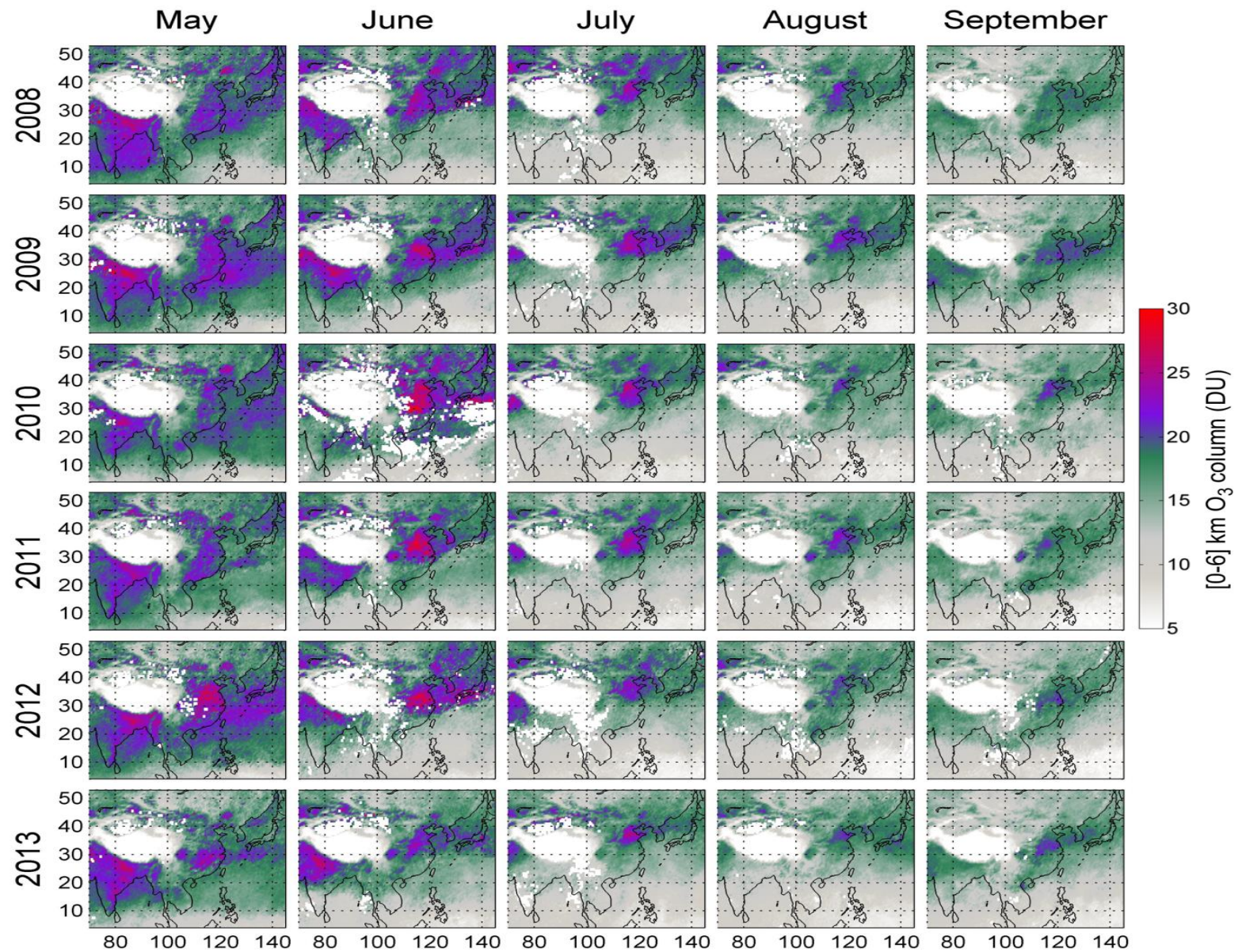
Credit A. Boynard 2015

3 cases studies with IASI



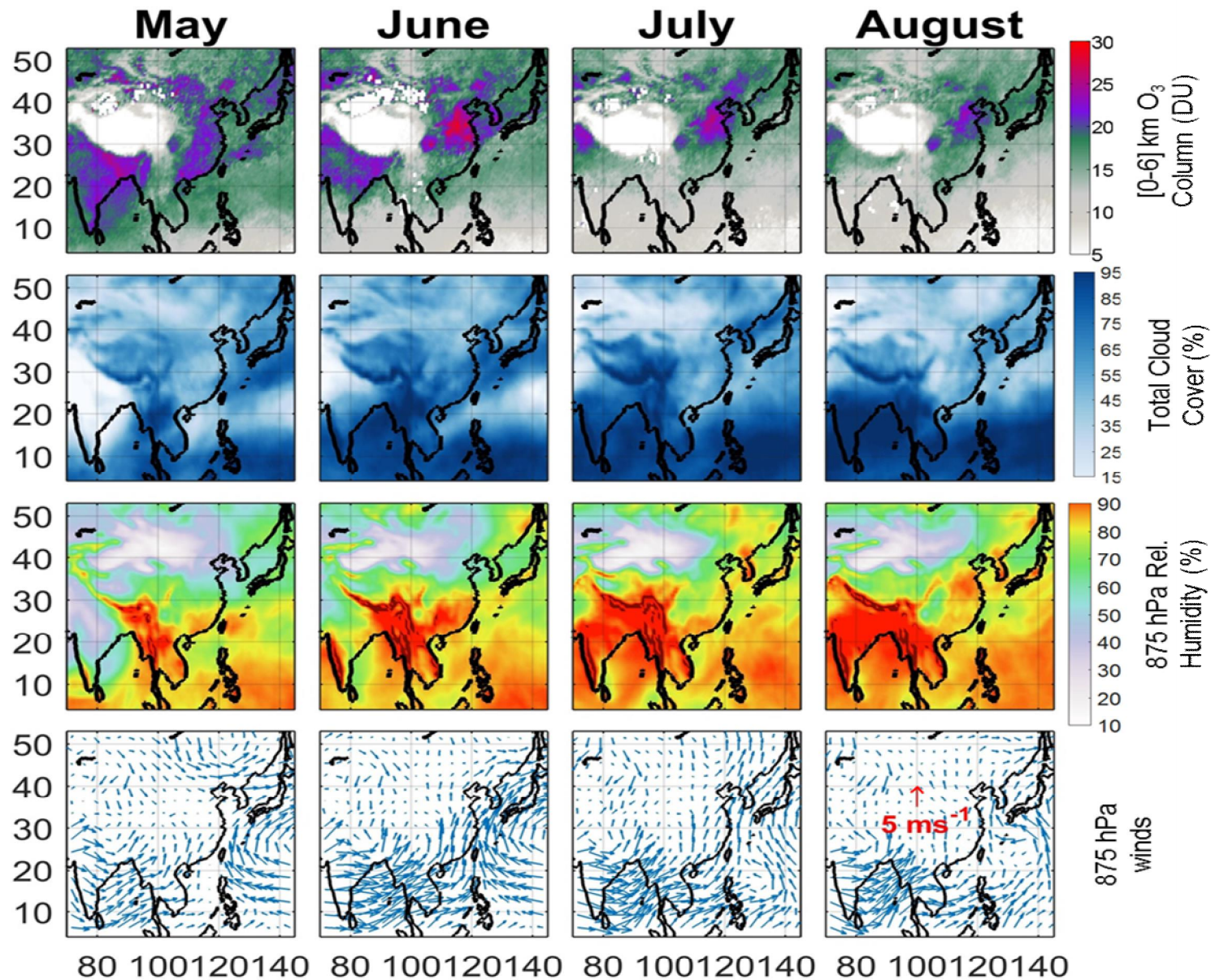
East summer monsoon (ozone)
May-August

East Asian Summer Monsoon



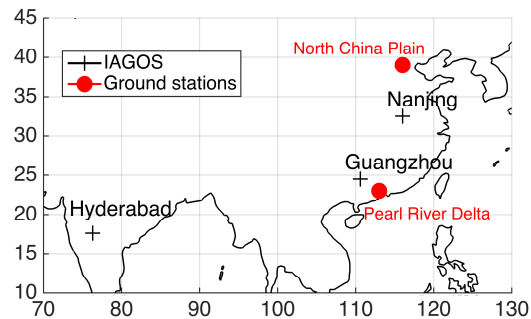
Credit S. Safieddine 2015

East Asian Summer Monsoon

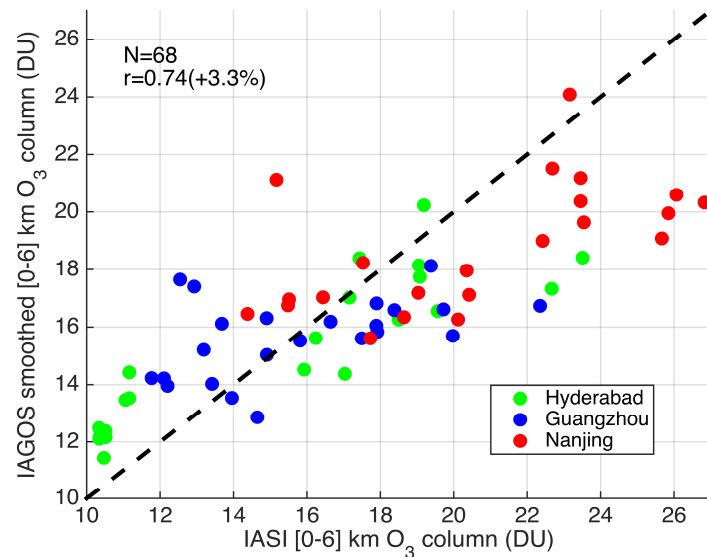
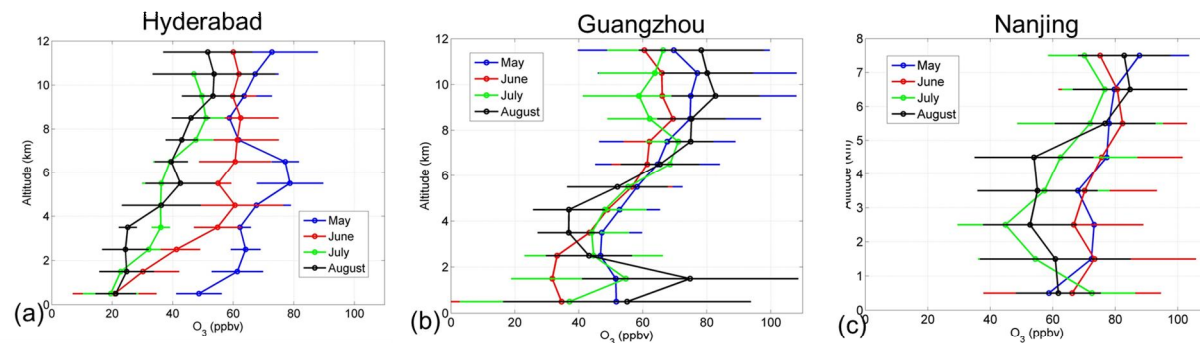


Credit S. Safieddine 2015

East Asian Summer Monsoon



IAGOS ozone data



IAGOS vs IASI ozone data R= 0.74

Credit S. Safieddine 2015

Perspectives

2006 é 2012 é . 2018 é . 2021 é 2026 é 2035



IASI-A/METOP-A



IASI-B/METOP-B



IASI-C/METOP-C



IASI-NG on METOP SG

IASI-A + IASI-B (+ IASI-C)

CO data available from the Ether database (<http://www.pole-ether.fr>)

Consistent set of +15 years of CO and O₃ observation

IASI-NG in 2021, 2027, 2033

Spectral resolution x2 (0.25 cm^{-1})

Reduction of noise by a factor of 2

better assessment of the lower troposphere