Global Concentrations of CH_4 : Retrieval and validation of Metop-A/IASI CH_4 columns

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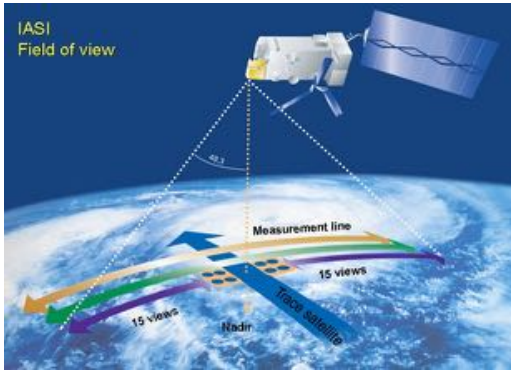
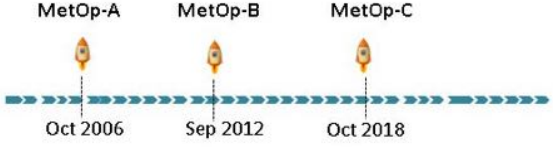
METOP/IASI

Cross-nadir scanning IR sounder

- FTS
- Thermal IR: 645-2760 cm^{-1} (3.62-15.5 μm)
- Spectral resolution: 0.5 cm^{-1} (apodized)
- Global coverage: 2 x day ($\sim$9:30/21:30 LT)
- FOV at nadir: 3.3 x 3.3° (50x50 km)

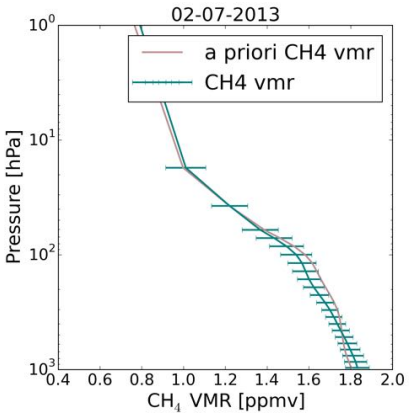


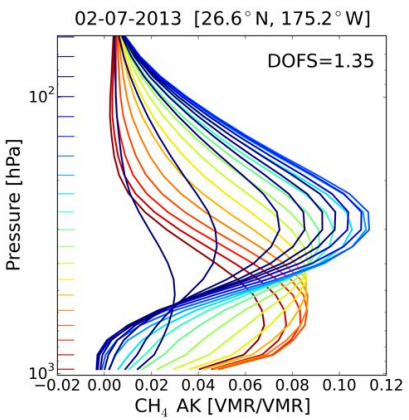
CNES-Eumetsat MetOp series



BIRA IASI-CH_4 retrievals

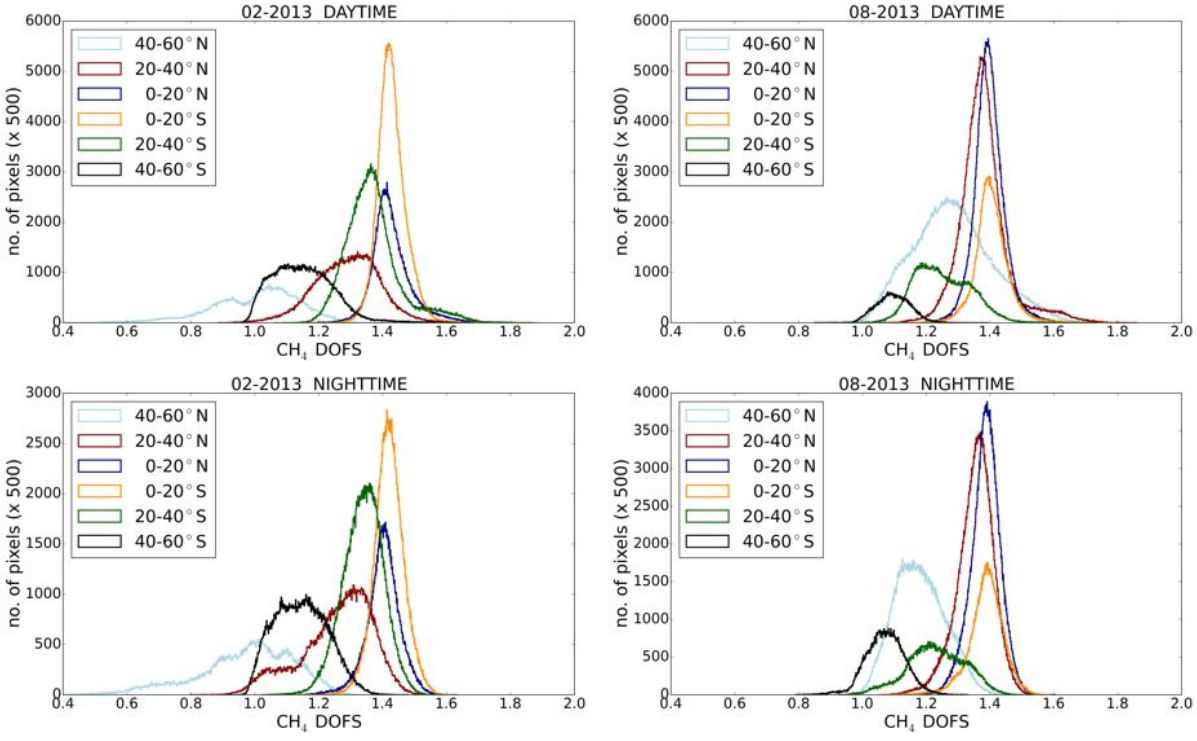
Characteristics	
Software	ASIMUT-ALVL[1]
Method	OEM
p, T, RH	IASI L2
T_{skin}	ECMWF
Emissivity	Zhou et al., 2011
a priori	WACCM





[1] Vandaele et al., 2008

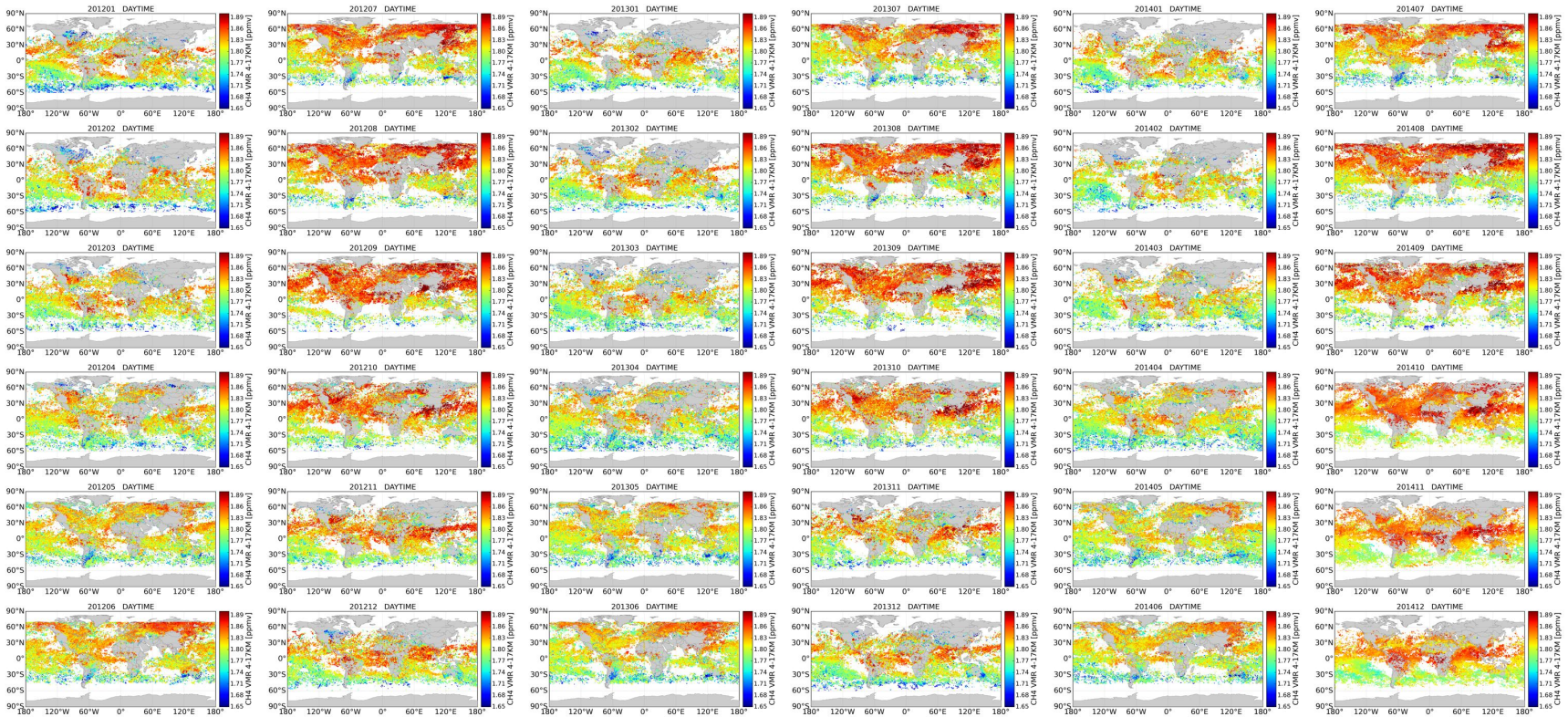
BIRA IASI-CH_4 - Information content



- August (NH summer): $1 < \text{DOFS} < 1.7$
- February (NH winter): $0.5 < \text{DOFS} < 1.7$
- Tropics: DOFS ~ 1.4

Global maps BIRA IASI-CH_4 4-17 km

2012 2013 2014



Validation with NDACC FTIR

CH_4 partial columns (surf-40km) at 11 NDACC stations (2010-2016):

- NDACC smoothed with IASI AK and a priori corrected

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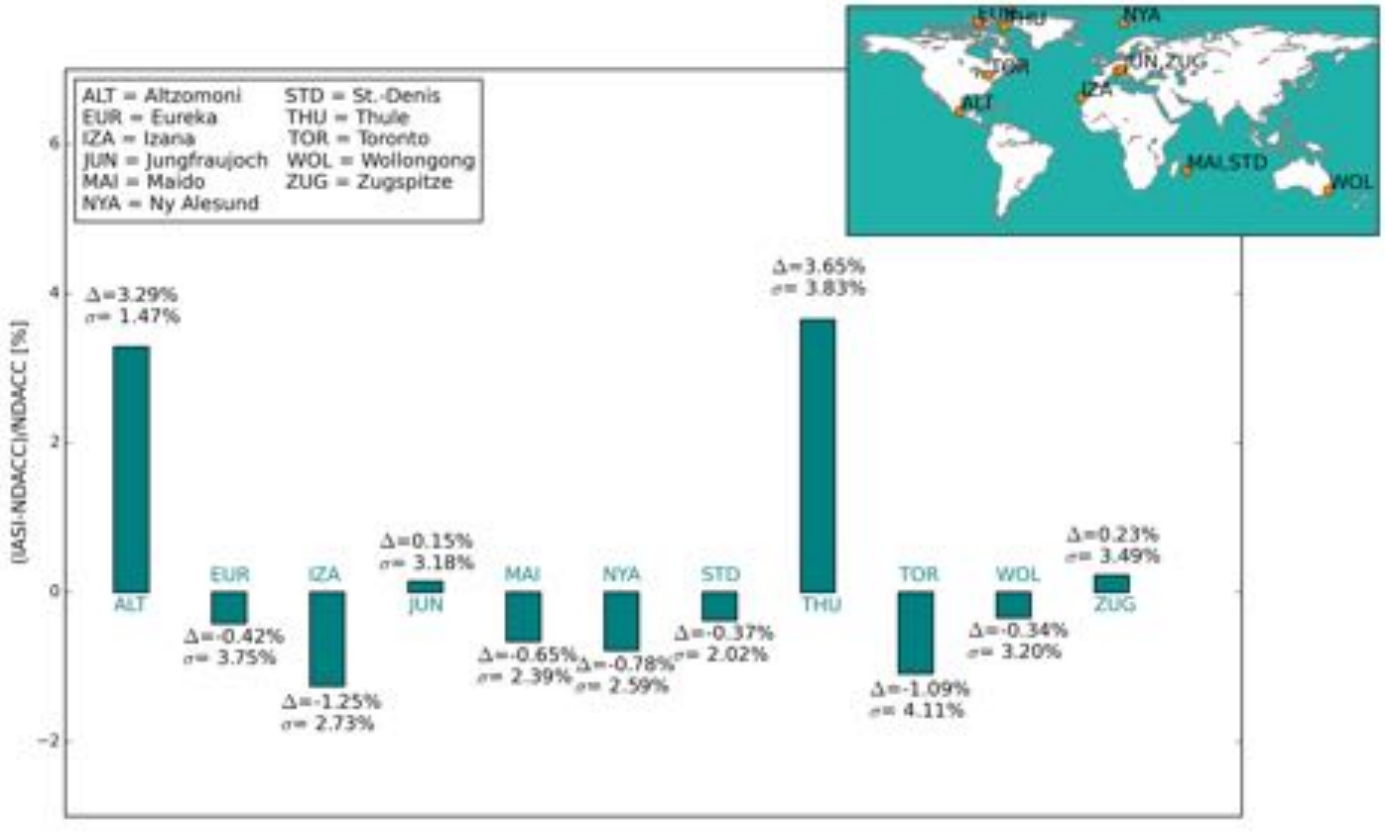

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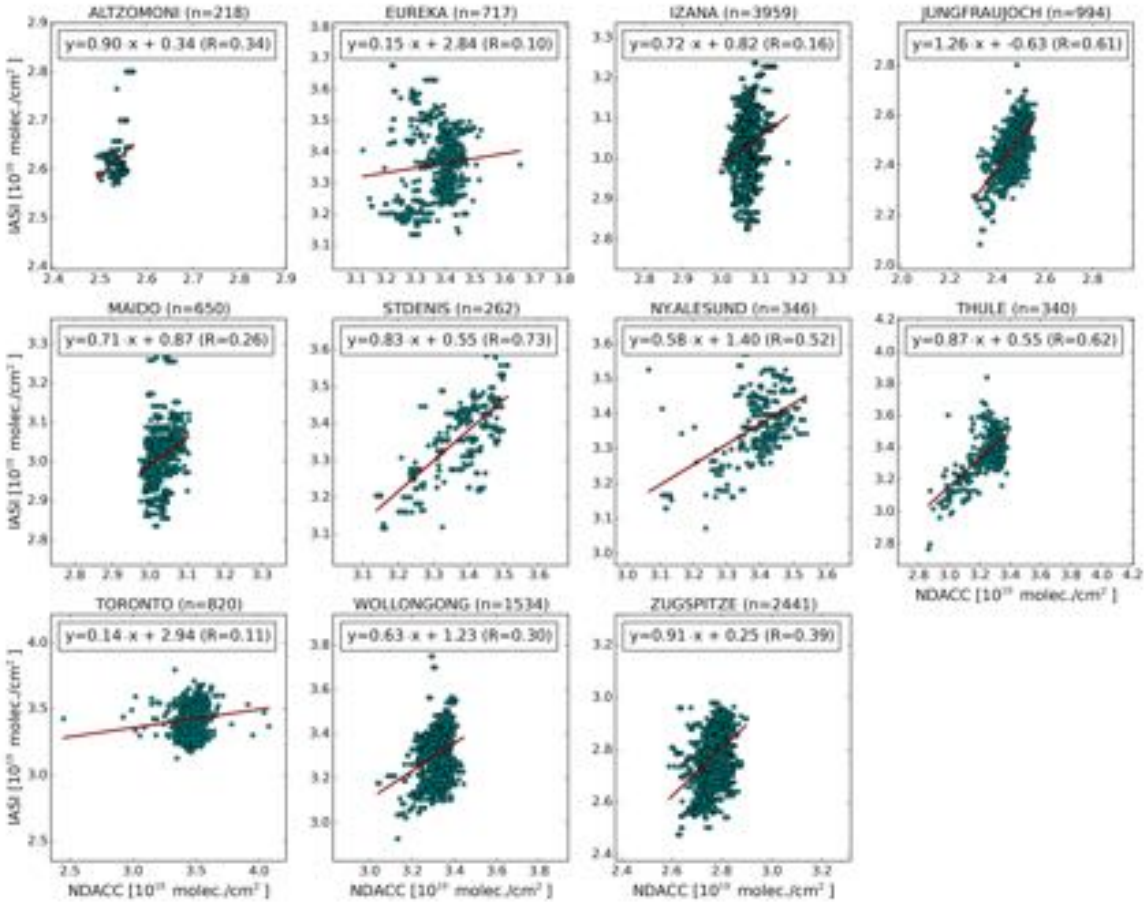
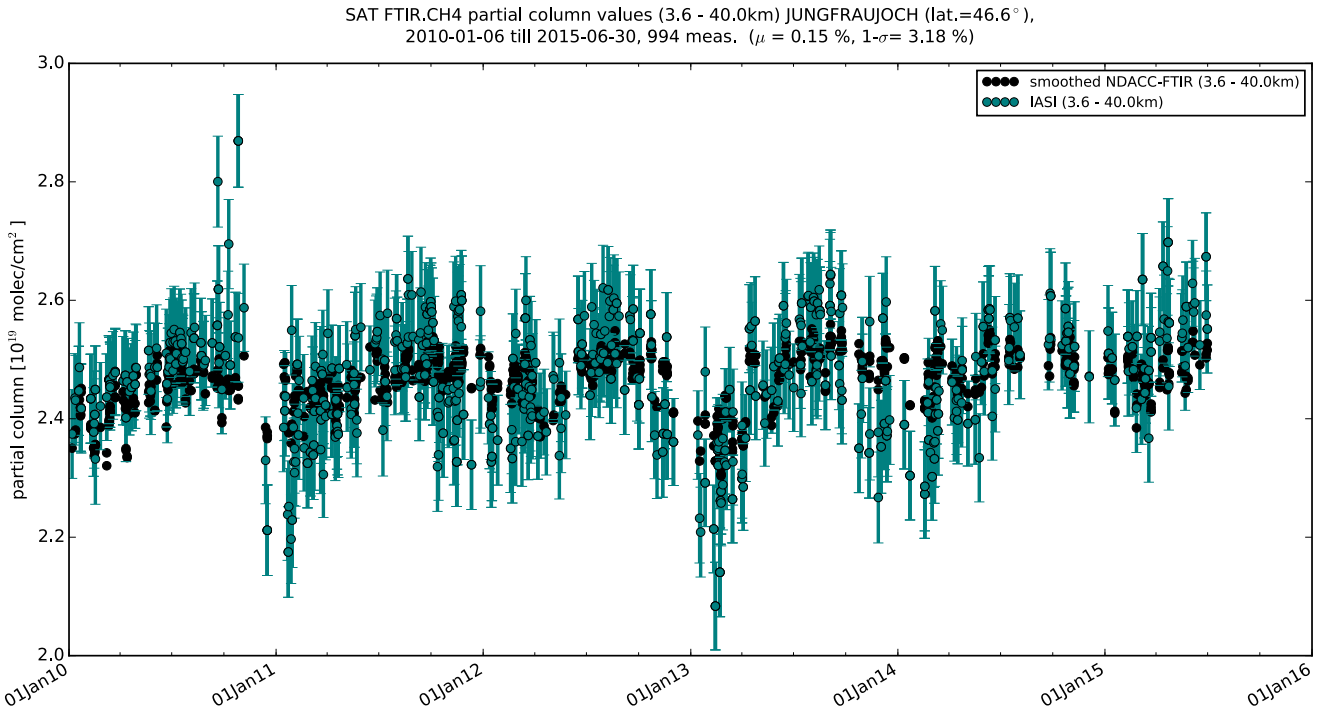


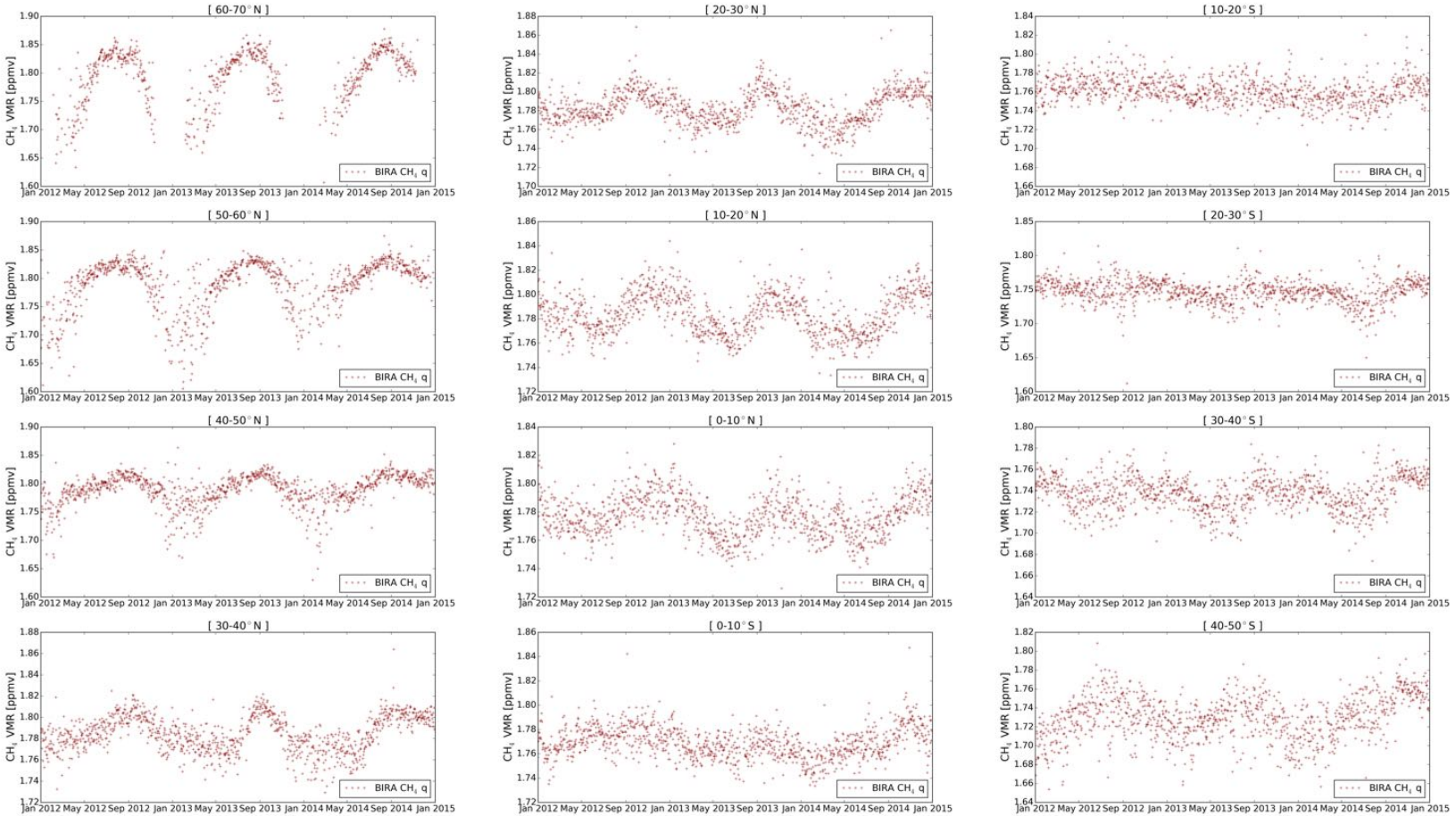
Jungfraujoch [46.6 °N]



IASI - smoothed NDACC

$\Delta = 0.15\%$ $\quad$ $1\text{-}\sigma = 3.18\%$

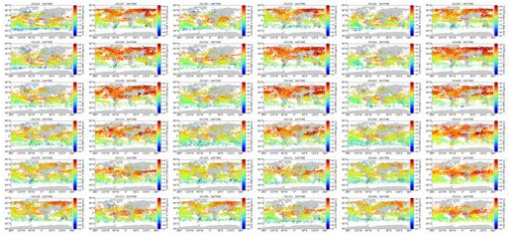
Timeseries 2012-2014



Summary

BIRA IASI-CH_4

- 3 year dataset of IASI-CH_4
- 1 independent piece of information



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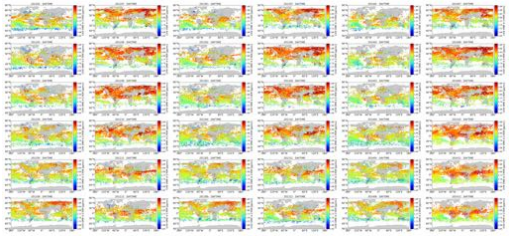
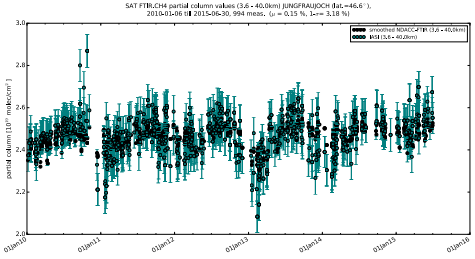


NDACC validation

- IASI-NDACC: -1.25 - 0.23 % exc. the sites Altzomoni, Thule
- Jungfraujoch: good representation seasonal cycle



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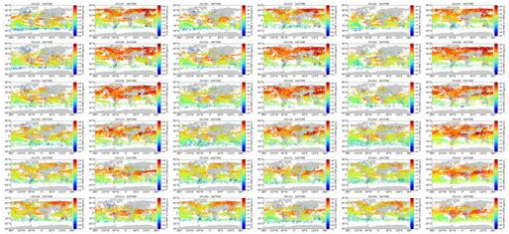

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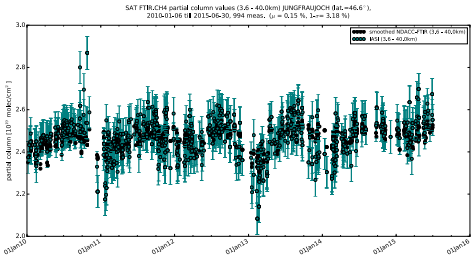

GHG-CCI

- Comparison with LMD IASI-CH_4 product
- BIRA IASI-CH_4 available on GHG-CCI website (`http://www.esa-ghg-cci.org`)

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