First global observations of formic acid and methanol from the IASI infrared sounder

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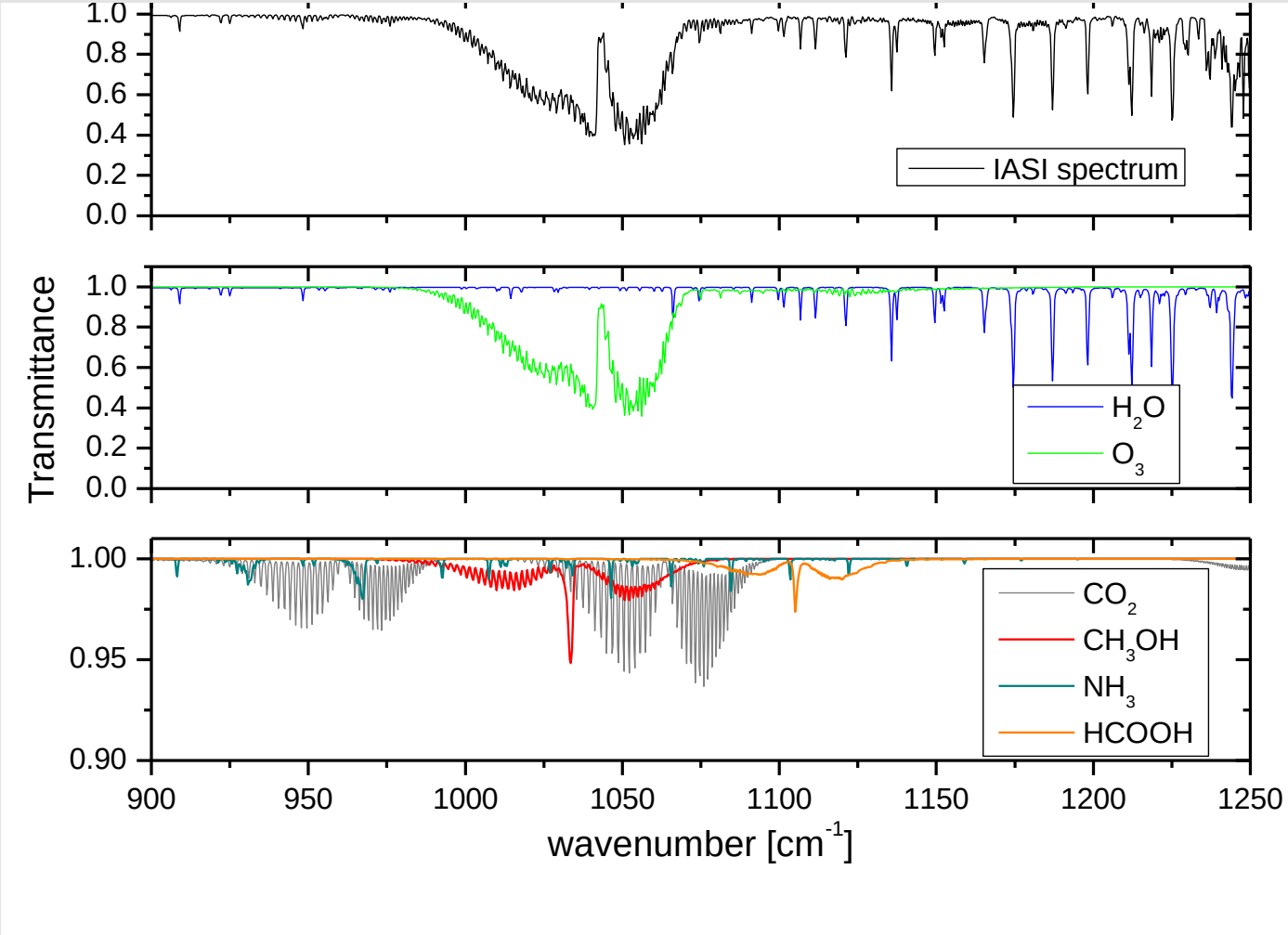
Overview

- Spectral signatures and fit examples
- Method approach
- Formic acid results
- Methanol results
- Conclusions

Infrared signatures

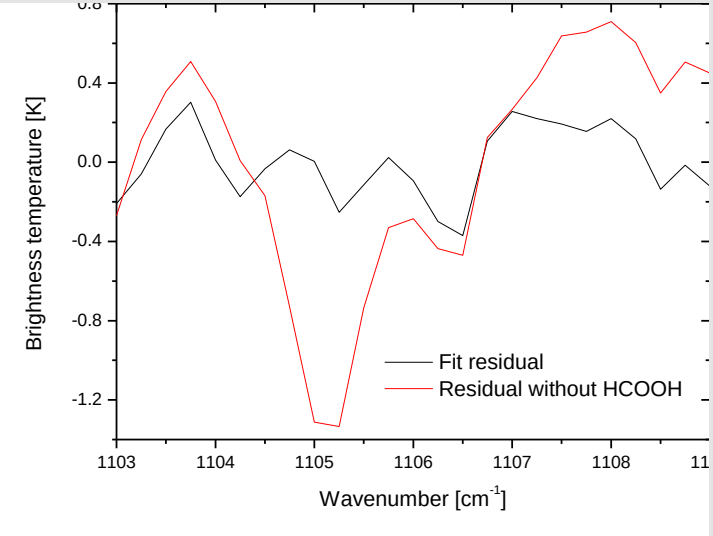


Weak absorbers

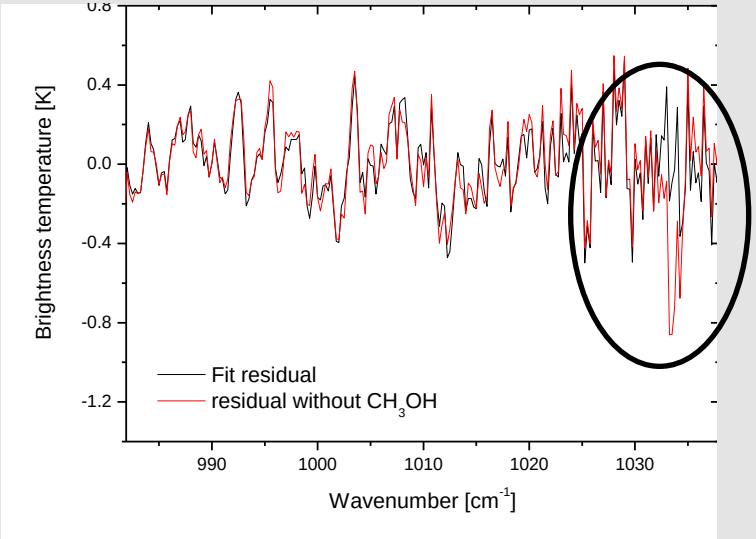
Main interferences by O_3 and H_2O

Fit examples

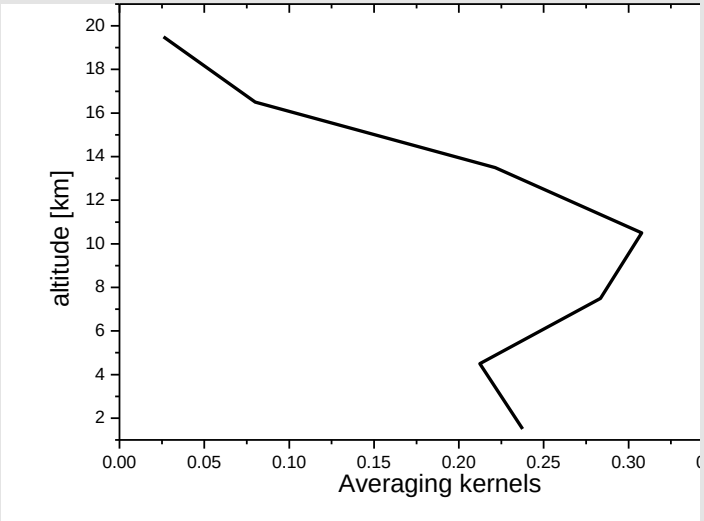
Formic acid

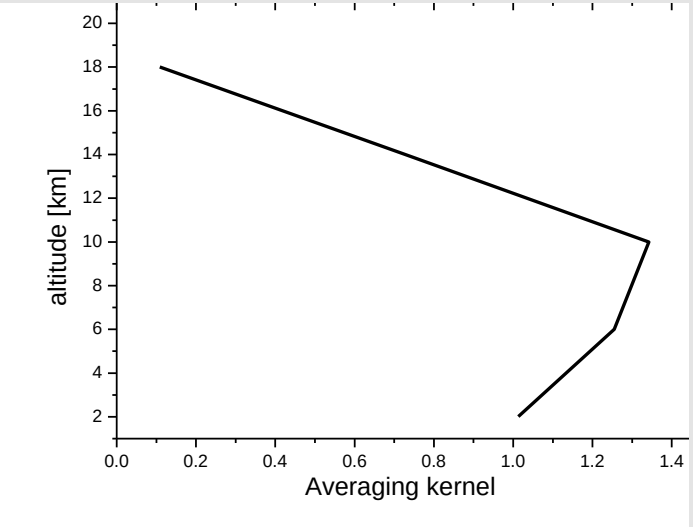


Methanol



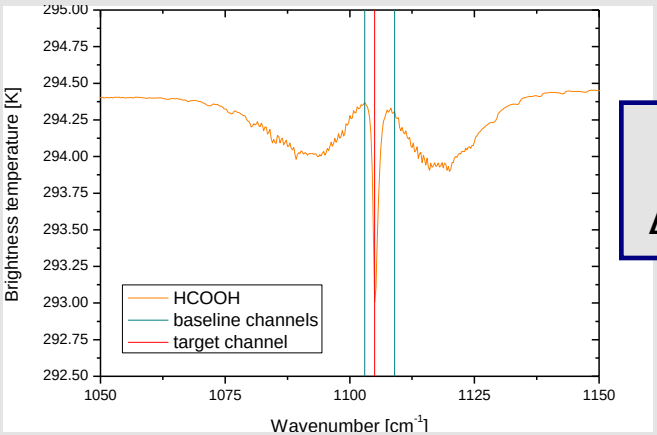
Averaging kernels



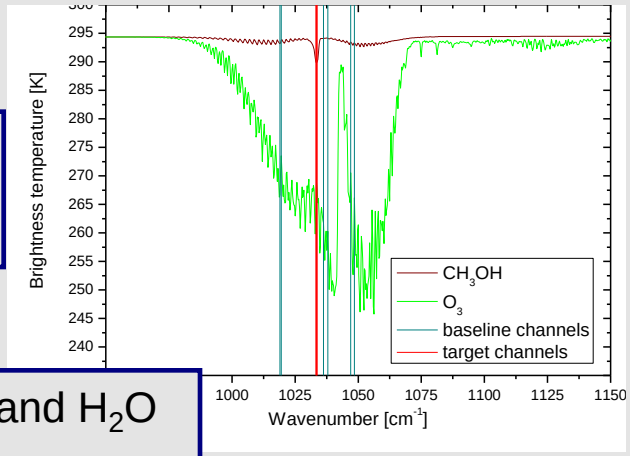


Retrieval method

Formic acid



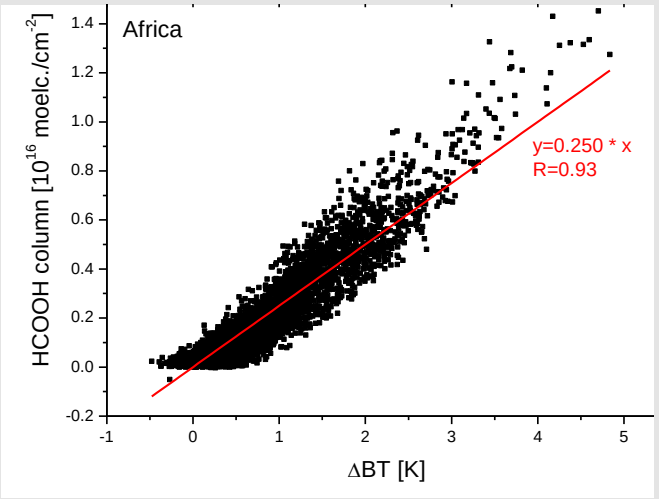
Methanol

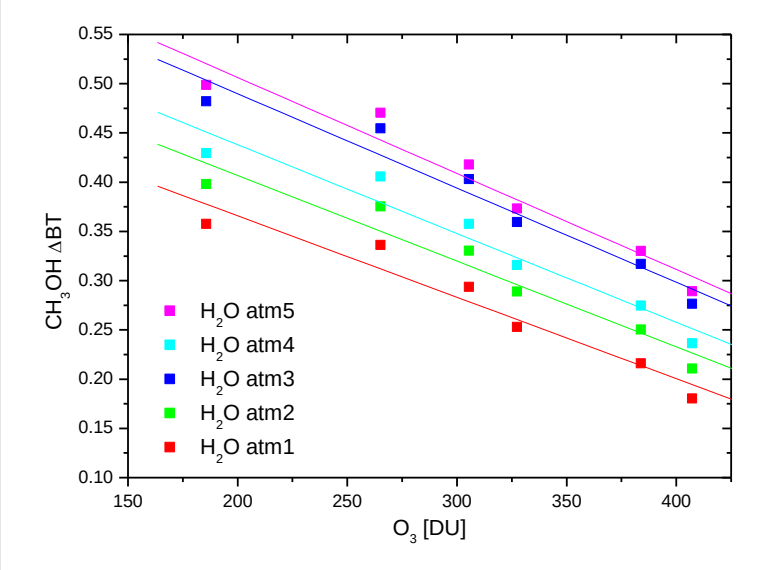


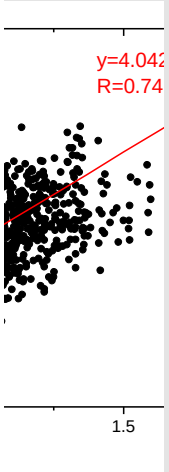
Fast approach

$\Delta BT = \text{mean}(BT_{baseline}) - BT_{target}$

Correction for O_3 and H_2O [FORLI]*



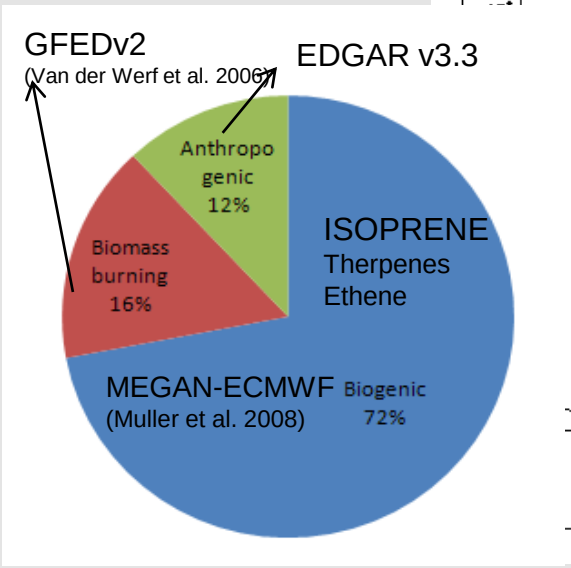


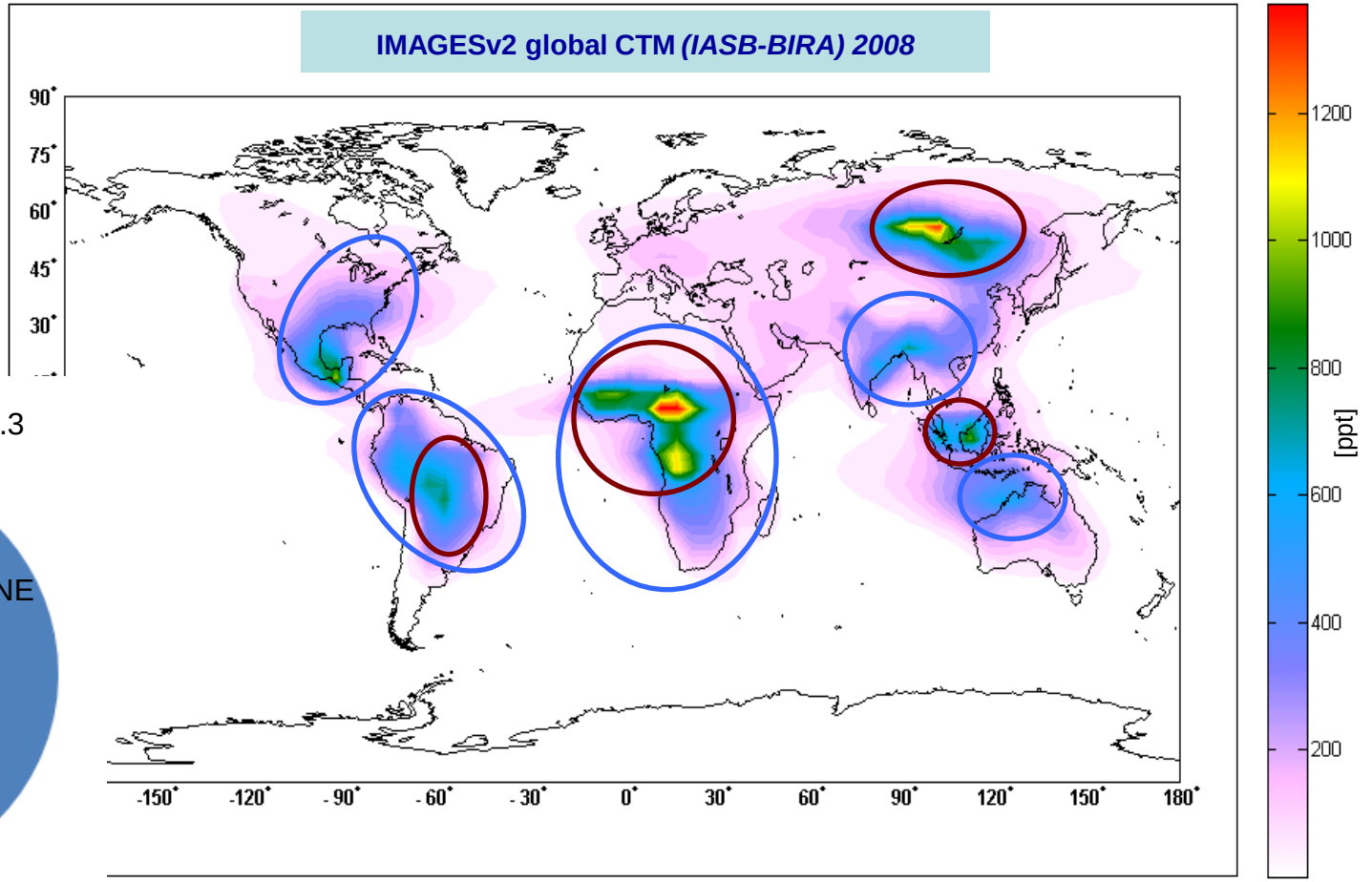


Conversion to total columns after a set of retrievals in various places

*C. Scannell's talk

Formic acid - HCOOH



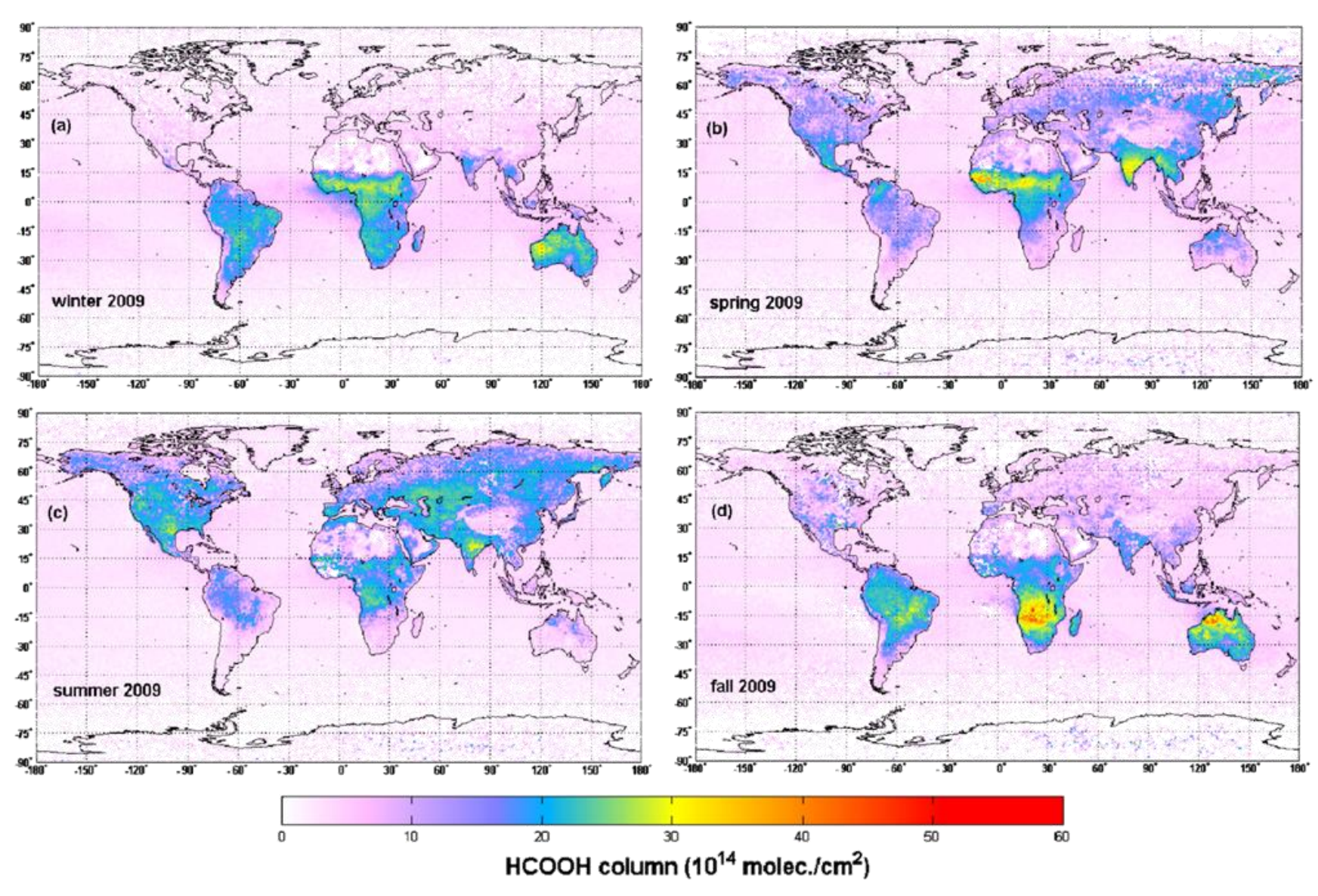


- Global emission : 10 Tg/year
- Secundary biogenic emissions

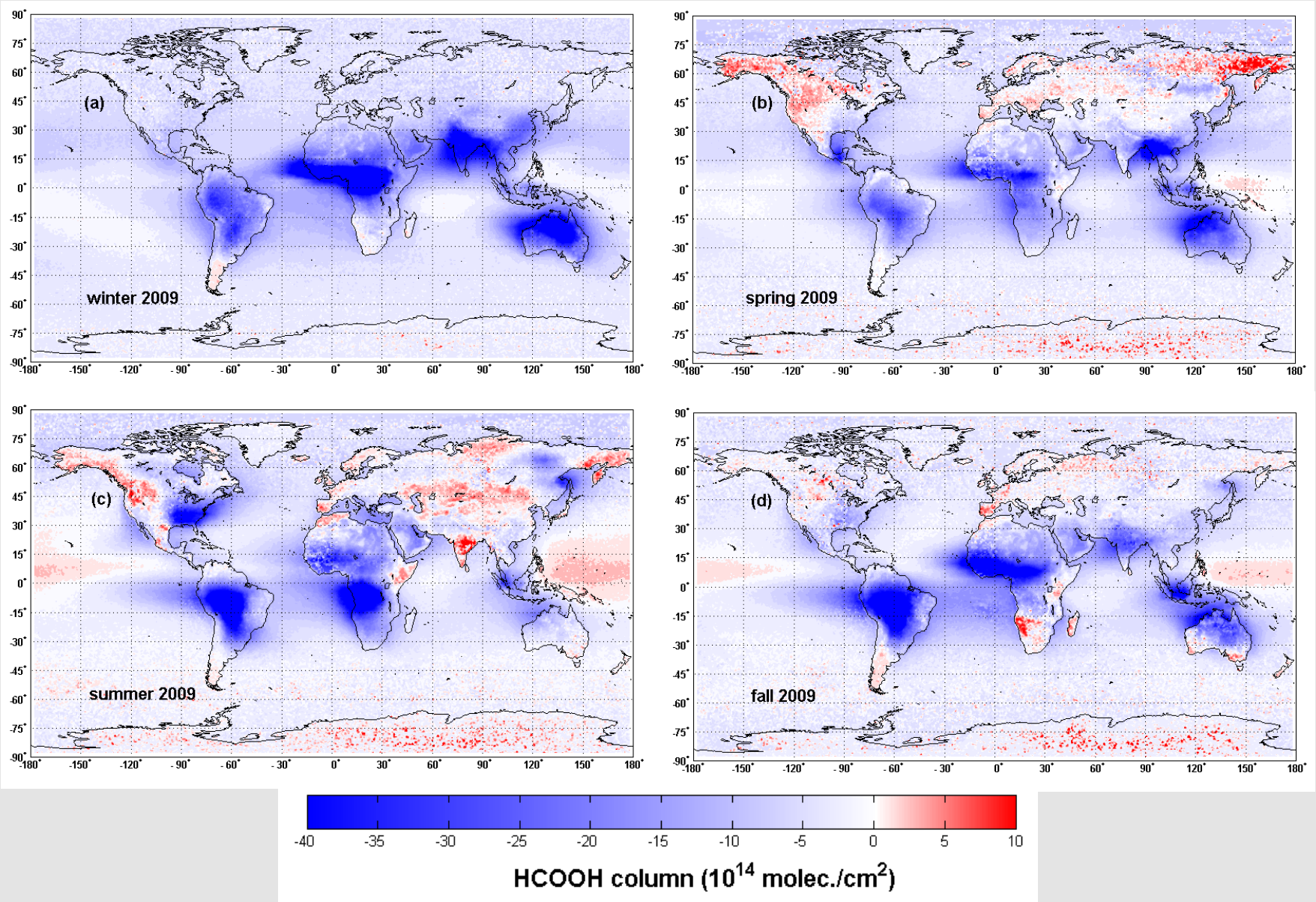
- **Sinks**: W/D deposition (63%)
  OH oxidation (37 %)
- Lifetime: 7 days

Formic acid - HCOOH

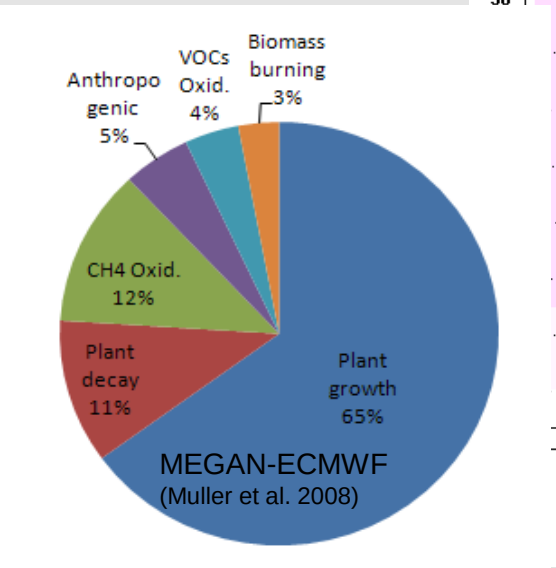
IASI 2009

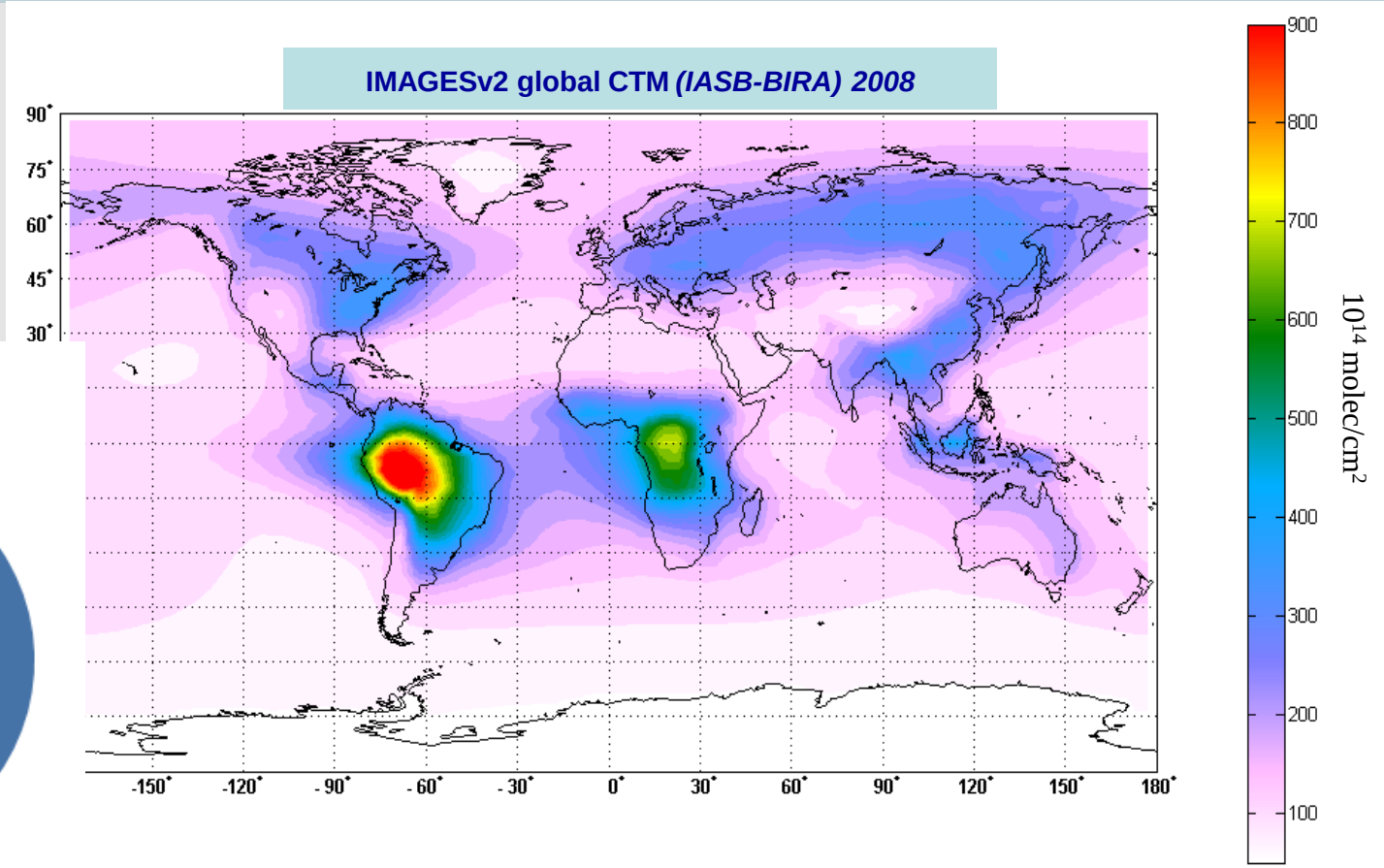


IASI 2009 – IMAGESv2 2008



Methanol – CH_3OH





- Global emission : 200 Tg/year
- Primary biogenic emissions

- **Sinks**: Dry deposition (25%)
  OH oxidation (75 %)
- Lifetime: 9 days

Methanol – CH_3OH

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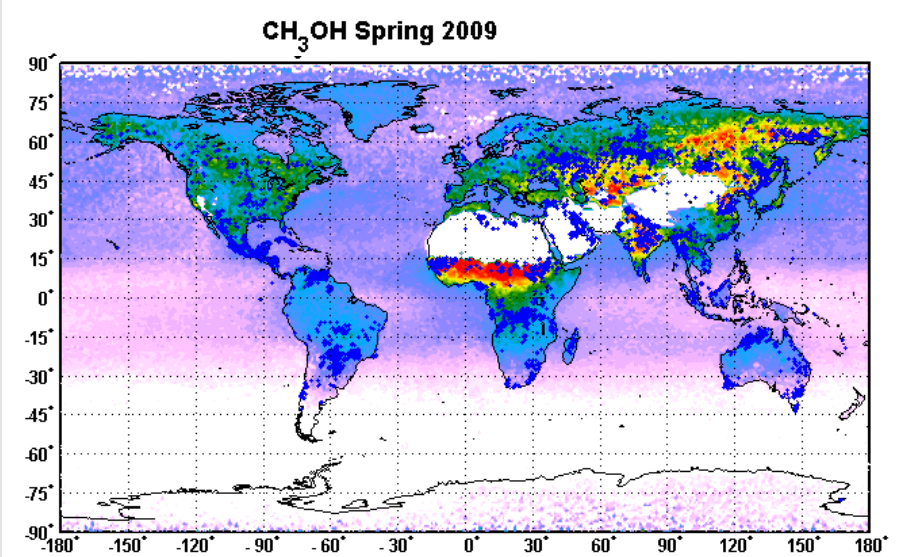
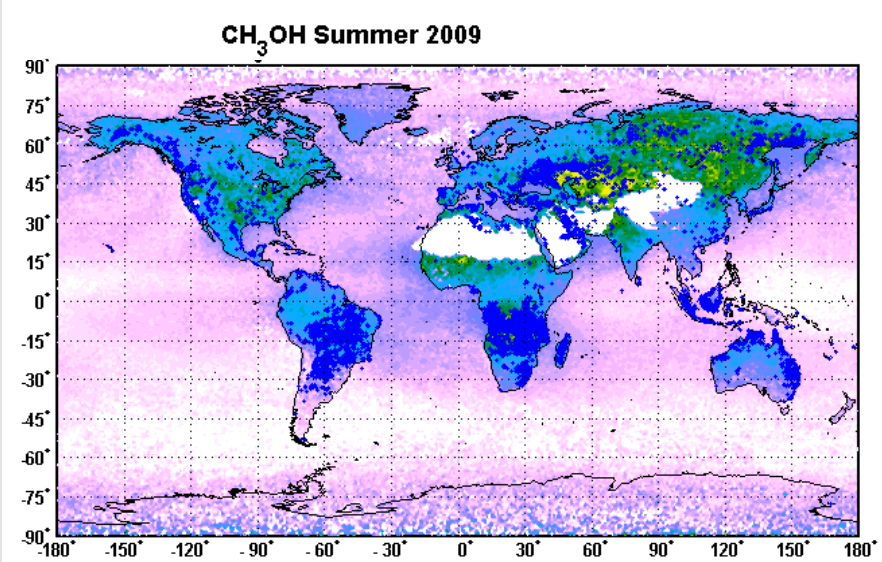
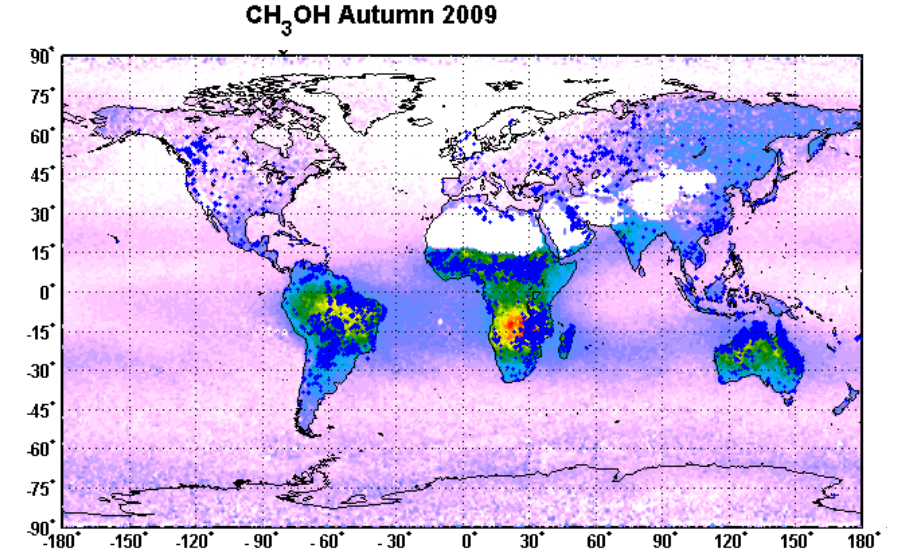
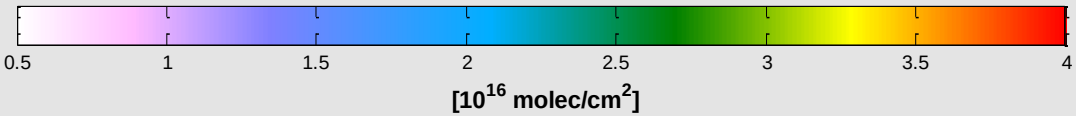
AATSR fires

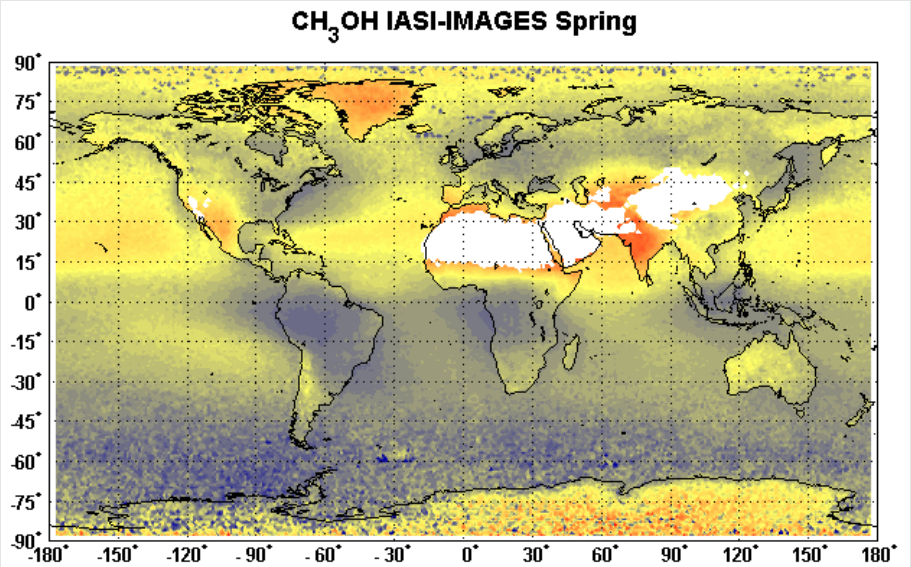


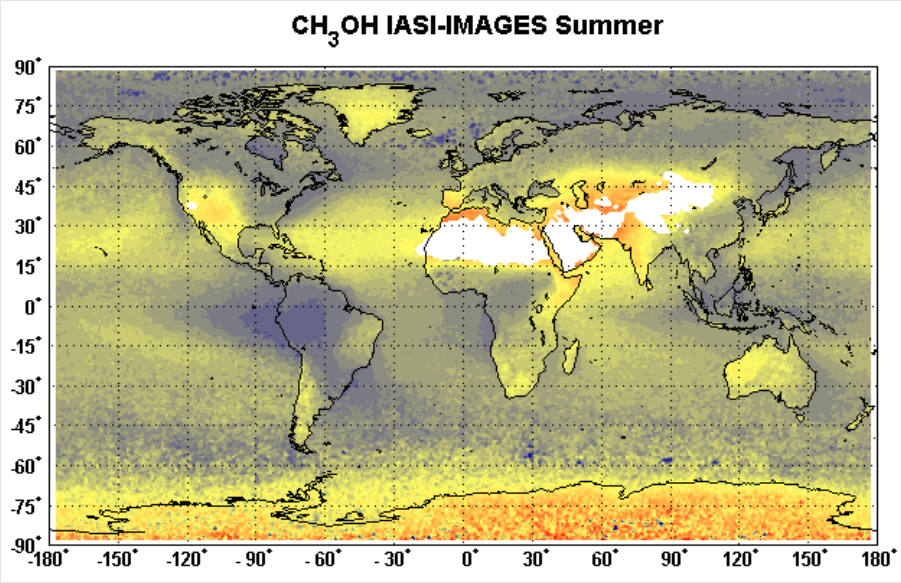


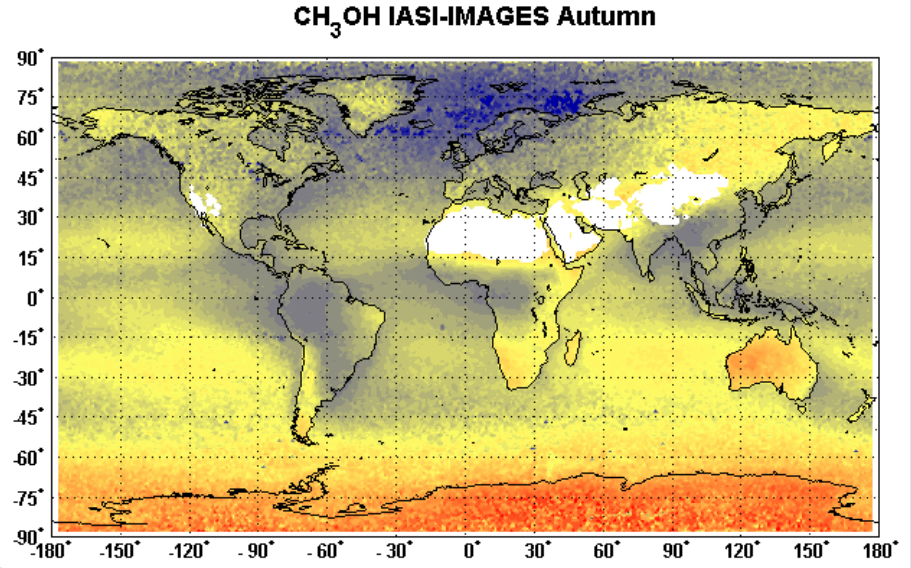


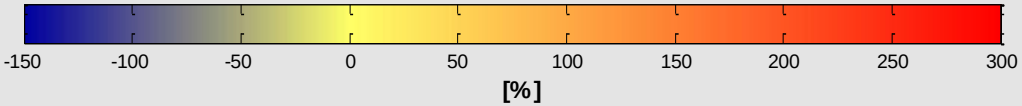


IASI 2009 - IMAGESv2 2008 relative differences

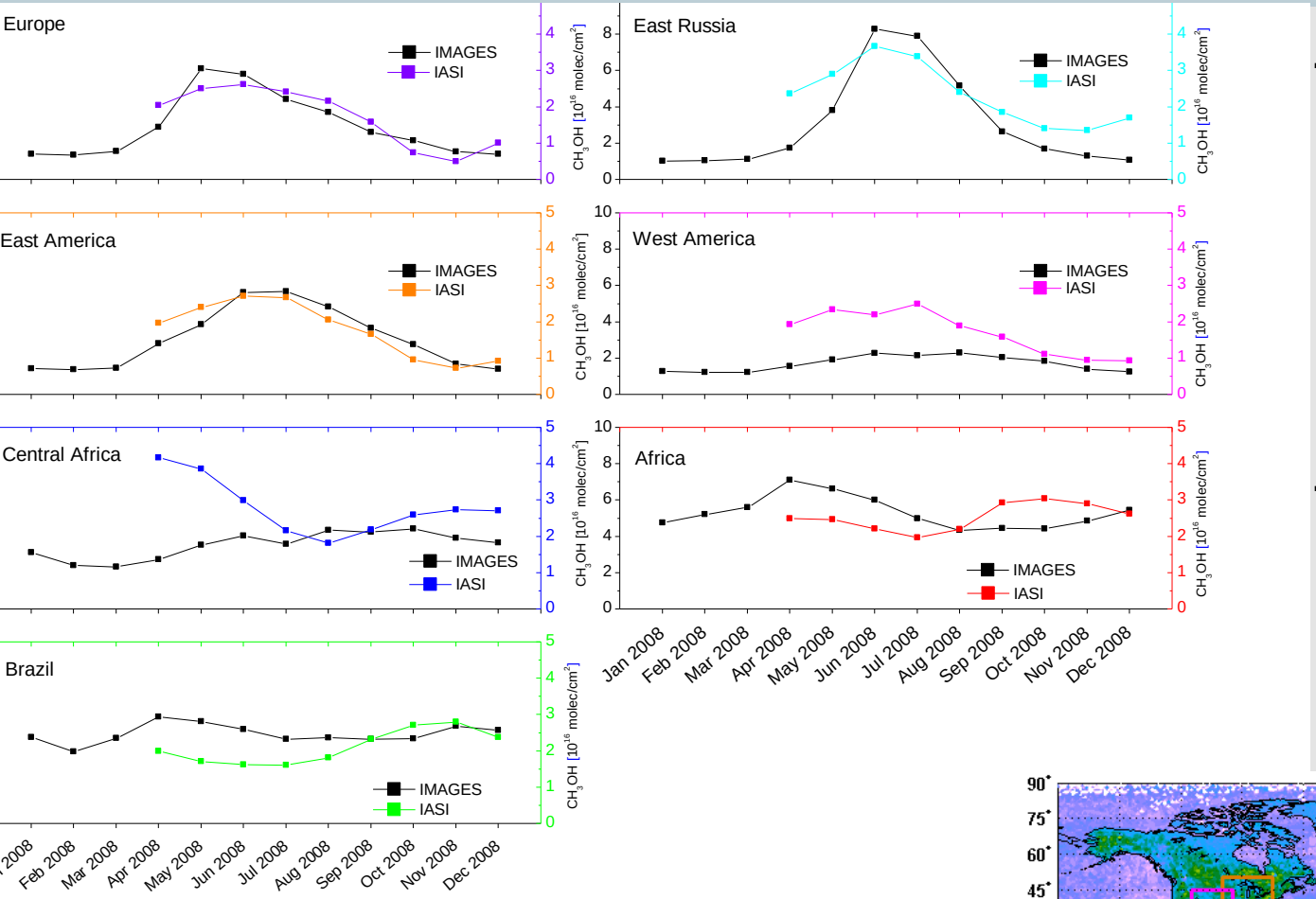




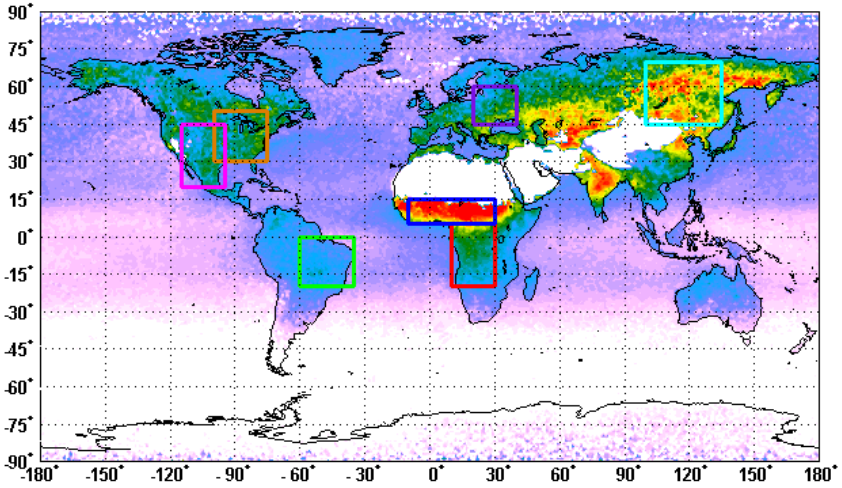




Methanol - seasonal trends



Northern Hemisphere



- Good agreement for the NH
- Stronger discrepancies above dry vegetation in Africa

Conclusions

Unexpected result from the IASI sounder

Formic acid :

- IASI measurements overall lower than the model
- Model underestimation in various parts of the world, mostly in the Northern Hemisphere

Methanol :

- IASI measurements lower than the model
- IASI higher concentrations due to fires
- Good relative agreement for seasonal trends in the Northern Hemisphere