

## **Report on the International Workshop on Greenhouse Gas Measurements from Space, 25-27 June, 2007, CNES, Paris.**

Meeting website: [http://geomon.ipsl.jussieu.fr/meetings\\_IWGGMS\\_0706.html](http://geomon.ipsl.jussieu.fr/meetings_IWGGMS_0706.html)

### **Summary**

The purpose of this meeting was to update the community on the retrieval and interpretation of satellite measurements of GHGs. The meeting was dominated by oral and poster presentations related to CO<sub>2</sub> and CH<sub>4</sub>, particularly activities in support of upcoming OCO and GOSAT space missions. There were also presentations about SCIAMACHY (CO<sub>2</sub>, CH<sub>4</sub>, and CO), MOPITT (CO), IASI (CO<sub>2</sub> and other gases), AIRS (CO<sub>2</sub>) and NOAA-10 (CO<sub>2</sub>). Some time was devoted to discussing the interpretation of data in terms of data assimilation (mostly 4DVAR) but most studies are using synthetic data. There were two breakout groups that focussed on 1) retrieval algorithms for CO<sub>2</sub>, and 2) the interaction between OCO and GOSAT, reflecting the overall focus of the meeting. The next meeting will be hosted by JPL and likely to be in Spring 2008.

### CO<sub>2</sub>

A number of groups showed CO<sub>2</sub> data from existing instruments, including SCIAMACHY, AIRS, and IASI. In this author's opinion SCIAMACHY represents the most mature CO<sub>2</sub> product with many competing groups working with the same radiances. An inter-comparison of CO<sub>2</sub> products from these groups has been planned. Definition of X<sub>CO<sub>2</sub></sub> is an important issue: scaling CO<sub>2</sub> by O<sub>2</sub> is unlikely to remove all common error because these two gases are fitted in different spectral windows. The AIRS PI showed thermal IR CO<sub>2</sub> data (and therefore sensitive to the mid-troposphere) interpreted using the GEOS-Chem chemical transport model. This presentation highlighted the need for accurate transport models of the lower troposphere if these data are to be used for source-sink estimation. GOSAT and OCO still have scheduled launch dates in 2008. Both instrument PIs are confident that they will meet this deadline. Emphasis was placed on retrieval algorithms, including improved spectroscopic parameters for line-by-line radiative transfer models to meet the precision requirements. Validation activities in support of both OCO and GOSAT are now being discussed using for example FTS and aircraft borne laser systems. How do we use ground-based data to validate satellite column data when the atmospheric footprint of space-based measurements can be 10-100s km? Some groups are already thinking beyond the nominal 2010 OCO life cycle. Presentations from A-scope (Earth explorer mission candidate) illustrated the science behind the CO<sub>2</sub> lidar. The GOSAT team still has to finalise their data policy. They announced that an AO is likely to be distributed in late 2007 for data access and collaboration with the GOSAT science team.

### CH<sub>4</sub>

The situation for CH<sub>4</sub> is less mature than CO<sub>2</sub>. While satellite measurements are already showing some interesting results over the tropics (e.g., Frankenberg study using SCIAMACHY radiances) there are not many surface measurements to validate the satellite data, and subsequently to test hypotheses relating to tropical CH<sub>4</sub> sources. Recent inverse analysis of SCIAMACHY CH<sub>4</sub> data supports initial finding using a forward model. MetOp-IASI CH<sub>4</sub> radiances look good and constituent retrievals are likely to commence shortly. Little was discussed about GOSAT CH<sub>4</sub> observations.

### CO

This trace gas is comparatively easy to fit and consequently the data are much more mature. Presentations by the MOPITT PI and the SCIAMACHY team illustrated the detailed information these measurements can now provide for surface emissions (e.g., fires) and transport processes.

### Other trace gases

Brief mention of tropospheric ozone (TES) and nitrous oxide.

### Next Meeting

To be hosted by JPL in 2008. Spring was mentioned but not confirmed.