

GHG-CCI QSR Oct-Dec 2012

1. Project Status

The GHG-CCI project (www.esa-ghg-cci.org) has made significant progress during the reporting period. The project is on track in terms of meeting its objectives within the planned schedule. No major problems have been encountered.

2. Status of ECV Production and Validation

The GHG-CCI Round Robin (RR) phase ended as planned end of Aug 2012. The RR decision and its justification are documented in the Algorithm Selection Report (ASR) available on the GHG-CCI website. The selected algorithms are also listed in a table given on the GHG-CCI website. A focus of the reporting period was to write a publication on the GHG-CCI RR activities, which has been submitted to Remote of Environment (RSE, CCI Special Issue). Beginning of Sep 2012 the generation of the Climate Research Data Package (CRDP) started. Processing will finish end of Feb 2013.

3. Recent Science Achievements

Cogan, A., Boesch, H., Parker, R., Feng, L., Palmer, P., Blavier, J.-F., Deutscher, N., Macatangay, R., Notholt, J., Roehl, C. M., Warneke, T., Wunch, D. (2012), Atmospheric carbon dioxide retrieved from the Greenhouse gases Observing SATellite: Comparison with ground-based TCCON observations and GEOS-Chem model calculations, *J. Geophys. Res.*, 117, D21, doi:10.1029/2012JD018087.

Heymann, J., H. Bovensmann, M. Buchwitz, J. P. Burrows, N. M. Deutscher, J. Notholt, M. Rettinger, M. Reuter, O. Schneising, R. Sussmann, and T. Warneke SCIAMACHY WFM-DOAS XCO₂: reduction of scattering related errors, *Atmos. Meas. Tech.*, 5, 2375-2390, 2012.

Heymann, J., O. Schneising, M. Reuter, M. Buchwitz, V. V. Rozanov, V. A. Velasco, H. Bovensmann, and J. P. Burrows, SCIAMACHY WFM-DOAS XCO₂: comparison with CarbonTracker XCO₂ focusing on aerosols and thin clouds, *Atmos. Meas. Tech.*, 5, 1935-1952, 2012.

Reuter, M., H. Bovensmann, M. Buchwitz, J. P. Burrows, N. M. Deutscher, J. Heymann, A. Rozanov, O. Schneising, H. Suto, G. C. Toon, and T. Warneke (2012), On the potential of the 2041-2047 nm spectral region for remote sensing of atmospheric CO₂ isotopologues, *Journal of Quantitative Spectroscopy and Radiative Transfer*, 113(16), 2009-2017, doi:10.1016/j.jqsrt.2012.07.013.

Reuter, M., H. Boesch, H. Bovensmann, A. Bril, M. Buchwitz, A. Butz, J. P. Burrows, C. W. O'Dell, S. Guerlet, O. Hasekamp, J. Heymann, N. Kikuchi, S. Oshchepkov, R. Parker, S. Pfeifer, O. Schneising, T. Yokota, and Y. Yoshida, A joint effort to deliver satellite retrieved atmospheric CO₂ concentrations for surface flux inversions: the ensemble median algorithm EMMA, *Atmos. Chem. Phys. Discuss.*, 12, 23195-23217, 2012.

Schepers, D., S. Guerlet, A. Butz, J. Landgraf, C. Frankenberg, O. Hasekamp, J.-F. Blavier, N.M. Deutscher, D. Griffith, F. Hase, E. Kuro, I. Morino, V. Sherlock, R. Sussmann and I. Aben: "Methane retrievals from Greenhouse Gases Observing Satellite (GOSAT) shortwave infrared measurements: Performance comparison of proxy and physics retrieval algorithms" *J. Geophys. Res.*, 117, D10307, doi:10.1029/2012JD017549, 2012.

Schneising, O., J. Heymann, M. Buchwitz, M. Reuter, H. Bovensmann, and J. P. Burrows, Anthropogenic carbon dioxide source areas observed from space: assessment of regional enhancements and trends, *Atmos. Chem. Phys. Discuss.*, 12, 31507-31530, 2012.

4. Future Activities

.During the remaining 8 months of Phase 1 of GHG-CCI the following activities will be carried out:

- Jan-Feb 2013: Generation of the CRDP. Update of ATBDs. Generating first drafts of Product Users Guide (PUG).
- Mar-May 2013: Initial validation of CRDP incl. documentation via Product Validation and Intercomparison Report (PVIR). PVIR will also include model comparisons as conducted by the GHG-CCI Climate Research Group (CAR) and assessments carried out by the retrieval team.
- Jun-Aug 2013: Initial user assessment of the CRDP via inverse modeling of CO₂ and CH₄ surface fluxes (sources and sinks) documented via Climate Assessment Report (CAR). Update of PVIR. End of Aug 2013 the CRDP along with all relevant information including initial validation (final version of PVIR) and initial user assessment (final version of CAR) will be made publicly available via the GHG-CCI website

*** End of Report ***