Michael.Buchwitz@iup.physik.uni-bremen.de

GHG-CCI Quarterly Status Report (QSR) #12

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GHG-CCI QSR Jul-Sep 2013

1. Progress status

The project is on track in terms of meeting its schedule and objectives; the Final Presentation will take place at ESRIN on 30 Oct. 2013. All data sets and documents have been delivered and are available via http://www.esa-ghg-cci.org/ with the exception of the Climate Assessment Report (CAR), which is currently being iterated within the GHG-CCI team and will be made publicly available beginning of November at the latest.

2. ECV products generated

The 1st version of the Climate Research Data Package (CRDP#1) has been generated and is online (http://www.esa-ghg-cci.org/ -> CRDP). It includes the GHG-CCI ECV Core Algorithm (ECA) products XCO_2 and XCH_4 from SCIAMACHY (entire ENVISAT time series) and GOSAT (mid 2009 – Aug 2012) and Additional Constraints Algorithm (ACA) products from other satellite instruments (e.g., IASI, MIPAS). Interested users have to fill out a small questionnaire and will automatically be provided with a username and password to access the CRDP. ATBDs and Product User Guides (PUGs) are available without registration. The validation of the CRDP is described in the Product Validation and Intercomparison Report (PVIR) also available on http://www.esa-ghg-cci.org/.

3. Main improvements compared to previously existing data sets

Via GHG-CCI existing data sets (e.g., SCIAMACHY and GOSAT XCO_2 and XCH_4) have been significantly extended and improved in their quality as demonstrated using various peer-reviewed publications (see http://www.esa-ghg-cci.org/ -> Publications). Also entirely new products have been generated, e.g., CO_2 and CH_4 stratospheric profiles from SCIAMACHY solar occultation measurements. Most of the relevant GCOS requirements for the CO_2 and CH_4 columns (ECAs) have been met. However, the requirements of the GHG-CCI Climate Research Group (CRG) are even more demanding. For example, the required relative accuracy for XCO_2 is < 0.5 ppm (CRG) compared to GCOS (< 1 ppm). Approx. 1 ppm (or even somewhat better, depending on product) has been achieved (see PVIR), but not the more demanding CRG requirement. For XCH_4, at least all threshold requirements have been met with the exception of SCIAMACHY after 2005 due to proceeding detector degradation. More work is needed to meet those requirements, which have not yet been met. To achieve this will be a main goal of Phase 2, which is expected to start January 2014.

4. Major science impacts

The data products have been used to address important science issues related to carbon fluxes. For example, GOSAT data have been used to study the summer 2010 Eurasian heat wave event (e.g., Guerlet et al., GRL, 2013) and also for the first time global CO_2 flux results from GOSAT have been published in the peer-reviewed literature (Basu et al., ACP, 2013). These applications are directly in line with the GCOS requirement for this ECV. The data products have also been used to assess the recent “renewed methane growth” scientific issue (e.g., Schneising et al., ACP, 2011; Crevoisier et al., ACP, 2013; Bergamaschi et al., JGR, 2013) and several other issues. To what extent GHG-CCI related publication have been used for IPCC AR-5 cannot be said at present as the new IPCC report has not yet been published. For an overview of the scientific achievements summarizing key results as published in the peer-reviewed literature, please see Buchwitz et al., THE GREENHOUSE GAS PROJECT OF ESA’S CLIMATE CHANGE INITIATIVE (GHG-CCI): PHASE 1 ACHIEVEMENTS, Proceedings ESA Living Planet Symposium (LPS) (submitted), 9-13 Sept 2014, Edinburgh, to appear in ESA Special Publication SP-722, 2013 (access: http://www.esa-ghg-cci.org/index.php?q=webfm_send/148). During ESA’s LPS GHG-CCI team members have given more than 9 oral presentations (see also Newsletter No.4: http://www.esa-ghg-cci.org/?q=webfm_send/128) and also have presented several posters. Prior to the LPS, inputs have been provided to ESA and DLR for press release / webportal stories, which resulted in a significant attention of the media (e.g., various newspapers, see compilation of links to media response as given on http://www.esa-ghg-cci.org/). ** End of Report ***