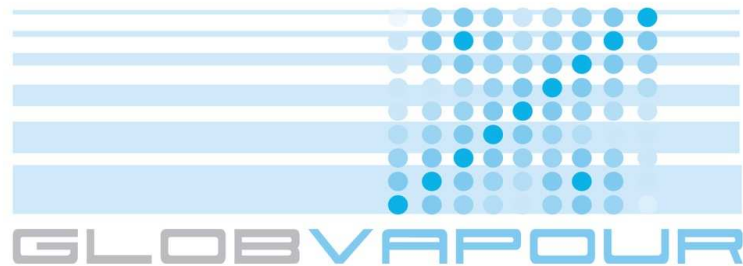




## DUE GLOBVAPOUR

### Monthly Progress Report

March 2011



Issue 1, Revision 0

06 April 2011

ESRIN/Contract No.: 22696/09/I-OL

Project Coordinator: Marc Schröder  
Deutscher Wetterdienst  
[marc.schroeder@dwd.de](mailto:marc.schroeder@dwd.de)

Technical Officer: Bojan Bojkov  
ESA  
[bojan.bojkov@esa.int](mailto:bojan.bojkov@esa.int)

**Monthly Progress Summary - ESA DUE GlobVapour**

ESRIN/Contract No.: 22696/09/I-OL

Reporting Period: 01.03.2011 - 31.03.2011

**Main Actions:** Update and improvements of SSMI TCWV L2 retrieval (1DVAR),  
Update and improvements of MERIS TCWV L2 retrieval  
Organizing and attendance of GlobVapour PM-3,  
Organizing and attendance of GV/GEWEX workshop, Frascati, Italy  
Start of the production of the test products for SSM/I and MERIS

**Activities, Achievements and Status - Phase I****Management and Coordination****WP 002 - Management and Coordination (M. Schröder)**

- The 3<sup>rd</sup> GlobVapour Progress Meeting was held at ESA, Frascati, Italy on 07 March 2011
- GV/GEWEX workshop held on 08 - 10 March 2011 in Frascati, Italy

**WP 020 - Promotion (M. Schröder)**

- Preparations for the GlobVapour Newsletter Vol. 1/2011 are ongoing.
- The updated set of document deliverables (ATBDs, PVRs) have been uploaded to the internal section of the GlobVapour webpage.
- Three presentations were given at the GRP / ESA DUE GV Meeting in March 2011 focussing on the general project overview, the validation of the prototype products and the IASI assessment
- Posters for the GlobVapour session at the EGU have been prepared.
- Updating the internal section of the GlobVapour website

**Creation of Diagnostic Data Set and validation tools****WP 210: Collection and procurement of validation data (M. Schröder)**

- Processing AIRS and MODIS L3 data for test months (2006-2008) finalised.
- Preparation for Level 2 validation ongoing.

**WP 220: Collection and procurement of satellite data (M. Schröder)**

- Procurement of SSM/I L1c data for test products has been completed.
- AATSR data acquisition is ongoing.

**WP 230: Development of validation tools (M. Schröder)**

- IDL tools for comparison of diurnal cycles of IASI+SEVIRI and validation against ground-based MWR observations are under ongoing development.
- IDL tools for validation of L3 products have been upgraded with processing of validation results for multiple months.

## Development of Prototype Product

### WP 310: Development of GOME/SCIAMACHY/GOME-2 retrieval scheme (D. Loyola)

- Investigation and derivation of an improved error calculation (next steps will be further testing and implementation).

•

### WP 320: Development of MERIS retrieval scheme (R. Preusker)

- As presented at the PM-3, the MERIS retrieval system has been improved towards a better inclusion of scattering effects, which are in particular important over coastal regions.

•

### WP 330: Development of SSM/I - MWR retrieval scheme (M. Schröder)

- Global hybrid option has been introduced to the system which uses a global map of 3-year-averaged ERA-Interim water vapour values as background. This is an extension to the previously developed 'simple' hybrid version which used a standard water vapour climatology independent of latitude and longitude. The new version ('global hybrid') still uses daily temperature, wind and surface pressure fields from ERA-Interim. The prototype months are currently reprocessed using the latest version.
- Further, the production of the test months has been initiated accompanied with an initial evaluation to monitor the quality while processing.

### WP 340: Establishment of consistency of MERIS and SSMI (M. Schröder)

- WP 320 and WP 330 finished. The processing of the test products has started at DWD for SSM/I and at FUB for MERIS.

•

### WP 350: Development of ATSR/AATSR retrieval scheme (R. Preusker)

- The AATSR TCWV processor is being prepared for the inclusion of more realistic temperature profiles.

•

### WP 360: Assessment of existing IASI retrieval schemes (M. Schröder)

- DLR reprocessed the data from July and August 2007. Processing of data from June and December 2008 is currently ongoing.
- Discussion with NOAA manifested its contribution to the IASI assessment. Corresponding data will be delivered soon.
- Discussion with EUMETSAT clarified that the results of the 'EUMETSAT processor v5' were actually derived using an intermediate processor version not officially released. EUMETSAT is currently working on updating its IASI processing system. DWD is supporting this effort by providing IASI L1c, NWP and ARM data to EUMETSAT.
- The evaluation scripts for the IASI assessment have been developed further to enable a more comprehensive use of the IASI retrieval data by allowing the evaluation temporarily independent among the retrieval systems.

•

### WP 370: Development of merged IASI/SEVIRI profile product (M. Schröder)

- The evaluation of the diurnal dependence of the quality of the combined IASI/SEVIRI product in comparison to the single-sensor-only products has been extended.

•

### WP 380: Production and validation of prototype data sets (M. Schröder)

- All combined SSM/I+MERIS prototype months are currently reprocessed as part of the test product processing using an improved MERIS system and modified background information for the SSM/I 1D-Var.
- Validation of updated IASI+SEVIRI (with ref. IASI) against GUAN, AIRS and ATOVS, and preparation of PVR 1.1.

•

**WP 390: Development of processing environment (U. Krämer)**

- Definition of 4 chains consolidated for SSM/I-MERIS, GOME-SCIA-GOME-2, IASI-SEVIRI, and (A)ATSR in a TN for internal discussion and clarification. This TN (current version 0.6) will serve as input to the DDF.
- Approach for data management and functions for bulk production control of stand-alone processing system described
- Presentation and discussion of processing chains at PM3
- Development of concurrent processing for stand-alone processing system started

**Processor Development and Test Product****WP 410: Development of GOME/SCIAMACHY/GOME-2 processing system (D. Loyola)**

- The WP has been started, and the evaluation is ongoing.

**WP 420: Development of MERIS-SSM/I processing system (M. Schröder, R. Preusker)**

- The development of the MERIS-SSM/I processing system is ongoing. The validation of MERIS L2 TCWV was extended by comparisons to GPS-derived water vapour amounts, showing good results. The MERIS-SSM/I processor and the according updated ATBDs will be delivered to BC by the end of April.
- L2 to L3 processor improved, now dealing with multiple sensors (F13, F14).

**WP 430: Development of AATSR processing system (R. Preusker)**

- Results of the update of the AATSR TCWV processor (WP350) will be awaited before final implementation of the AATSR processing system.

**WP 440: Development of IASI processing system (M. Schröder, R. Saunders)**

- Note the proposal on IASI-SEVIRI.

**WP 450: Development of IASI-SEVIRI processing system (M. Schröder)**

- Not yet started. Note the proposal on IASI-SEVIRI.

**WP 460: Production and validation of test data set (M. Schröder)**

- The production of the MERIS-SSM/I test data set (2006-2008) has been started at DWD (SSM/I) and at FUB (MERIS) and will be completed until the end of April.
- Reprocessing of prototype months for SSM/I + MERIS will be a byproduct initiated processing of the test period.
- AIRS and MODIS L2 to L3 processing for the test years (2006-2008) is finalised.

**WP 470: Development of stand alone processing system (U. Krämer)**

- Corresponding work is ongoing.

**Development of Final Product****WP 510: Production and validation of final data set (M. Schröder)**

- Not yet started.

**WP 520: Update of PS and System Delivery and Test Application at ESRIN (U. Krämer)**

- Not yet started.

## Scientific Exploitation

### WP 610: Comparison of GlobVapour Products to Climate Model Output (M. Ringer)

- Comparisons are ongoing.

### WP 620: Alternative Ways of Climate Model Evaluation (M. Ringer, R. Saunders)

- The WP has been started, and the evaluation is ongoing.

### WP 630: Establishment of the Scientific Exploitation Plan (R. Saunders)

- The SEP has been drafted - structure and contents are under discussion and topic for PM3.

## Next Steps and Schedule

- Continuation of the test products for SSM/I and MERIS
- Continuous validation efforts of growing test datasets for SSM/I and MERIS, in particular consider Level 2 validation and inter-comparisons.
- Finalizing and concluding on added value of merged IASI+SEVIRI product compared with single-sensor products at Lindenberg MOL
- Continuous developing the processing systems.
- Continuous development on all running WPs.

## Achievements

- Very successful 3<sup>rd</sup> GlobVapour Progress Meeting and joint GRP / GV workshop from 07 to 10 March.
- Latest ATBDs were delivered.
- Small adaptation of the SSM/I and MERIS retrieval systems and the kickoff of the production of the test months.

## Problems encountered and solutions proposed

- After extending the comparisons of ground-based microwave profiler and the IASI/SEVIRI as well as the single-sensor products, it is still not sure if a clear answer can be given whether there is an added value on monthly scales in the merged product compared with the single sensor products.
- Comparisons of the SSM/I 1D-Var hybrid setup solution revealed significant deviations from the HOAPS TCWV in polar regions. This was also found in previous L2 comparisons done against ARM ground-based microwave estimates of TCWV for the Barrow ARM site. This issue was only significant for the polar regions while for the mid-latitudes and tropical regions no such systematic deviation was found. This issue led to a reconstruction of the background fields in the hybrid solution, now containing a latitude and longitude dependent climatology for water vapour. This climatology was derived from three years of ERA-Interim fields.
- The large deviation found for the EUMETSAT v5 result during IASI assessment are explainable by the intermediate processor version that was used to derive these results. Thus, these data were no official v5 release. DWD is in contact with EUMETSAT to get v5 products to be included in the assessment. DWD is supporting this EUMETSAT effort by providing L1c, background, and validation data to EUMETSAT.
- On 30 November 2011 the project will be finished. It is likely that scientists working on temporal contracts will leave the project before November 2011. It is unlikely that for the remaining time new scientists can be recruited.