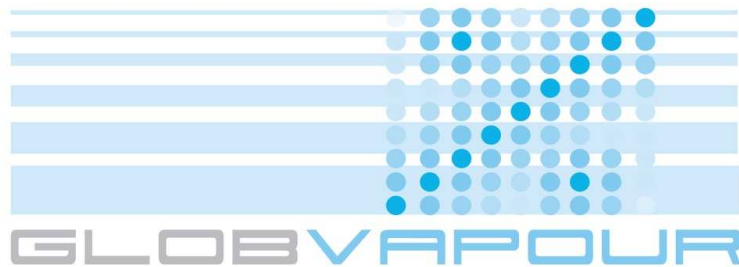




## DUE GLOBVAPOUR

### Monthly Progress Report

February 2011



Issue 1, Revision 0

16 March 2011

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

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**Monthly Progress Summary - ESA DUE GlobVapour**

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

Reporting Period: 01.02.2011 - 28.02.2011

**Main Actions:** Provision of SSMI+MERIS prototype months on 1.5 deg ERA-interim grid to User Community (UKMO),  
Update and improvements of MERIS TCWV L2 retrieval,  
Preparation of the GlobVapour PM-3,  
Preparation of the GV/GEWEX workshop, Frascati, Italy

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

- Following recommendations from PM2 the PVRs and ATBDs were updated. Version 1.0 updates to PVRs are completed and submitted to ESA, ATBDs are almost completed.
- The PMP version 2 has been drafted and submitted to ESA. Attached are the plans on AATSR, IASI+SEVIRI and IASI assessment.
- During a meeting between BC and DWD details of processing system were discussed. The way forward was outlined in large parts and BC started to gather required information already. At present, it is foreseen to implement the SSM/I+MERIS processor first.
- In a meeting with EUMETSAT the project supported drafting the agenda for the joint GRP/ ESA DUE GV meeting in March.
- The User Group has three new members from the US.

**WP 020 - Promotion (M. Schröder)**

- Preparations for the GlobVapour Newsletter Vol. 1/2011 started.
- The GlobVapour webpage was updated and revised, with a User Help Desk initialised and with data access via ftp designed and included. First user registered. News section updated with GOME article.
- List of User Group members on the website updated.
- SSMI+MERIS prototype months on 1.5 deg ERA-interim grid made available to User Community for evaluation (UKMO).
- The project submitted 6 (tbc) abstracts to the joint GRP / ESA DUE GV Meeting in March 2011.
- Abstract 'ESA DUE GlobVapour water vapour products: retrieval methods and validation' accepted by EGU for Session HS1.4 (EO for Water Cycle Science).
- 20 copies of NL vol 2/2010 reprinted for the GEWEX User Workshop.

**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) ongoing.
- Preparation for Level 2 validation ongoing.

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

- Procurement of satellite data for test products nearly completed. Due to updated AATSR plans the acquisition of more AATSR data just started.

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

- Preparation for Level 2 validation ongoing. Tool for validation of diurnal cycles of IASI+SEVIRI against ground-based MWR observations is under development.
- IDL tools for validation of L3 products upgraded now including a.o. proper handling of AIRS layer integration and validation against IASI+SEVIRI, and CHAMP/COSMIC-1 L2 to L3 mm processing.

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

- At last PM a few adaptations to the current version were discussed which are currently under development.
- L3 ATBD updated following recommendations from PM2.
- Optimisation of the filtering criteria for flagging cloud-contaminated measurements.

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

- Above the dark ocean, the ratio of MERIS bands 15 and 14 is strongly influenced by atmospheric scattering. In order to correct this effect, the deviation of the observed reflectance in band 14 from the reflectance calculated for a rough ocean surface (Cox and Munk, 1956) is used to estimate the aerosol loading for each individual pixel. The Cox and Munk reflectance and the derived aerosol loading are then used to determine and correct the influence of atmospheric scattering on the measured band ratio. The method is expected to eliminate the strong dry bias of TCWV in the coastal area.
- The updated MERIS TCWV L2 retrieval was compared to Aeronet and GUAN radiosonde data.

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

- Update of 1D-Var; it includes new netcdf read routines for updated HOAPS and surface/scattering flags
- L2 SSMI ATBD updated following recommendations from PM2.

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

- Implementation of input from WP 320 and WP 330 almost finished.

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

- The AATSR TCWV algorithm was improved. It is now a full Optimal Estimation for three forward and three nadir views (3.7, 11, 12 $\mu$ m), applicable above nighttime ocean scenes, including a full uncertainty characterization. The algorithm was applied to one day of AATSR data and compared to GlobVapour SSMI retrievals and GHRSSST data.

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

- KIT and NOAA have been contacted. KIT will not be able to submit data in 2011 while NOAA intends to submit data in March 2011. Both is not considered to be critical.
- Further investigations on spectral window (micro-window) selection, in order to improve the retrieval at high altitudes. In fact, the spectral domain from 1200 to 2600 cm<sup>-1</sup> has been covered by an appropriate number of micro-windows by employing a sensitivity and an error analysis.

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

- Case studies were conducted investigating the diurnal dependence of the accuracy of the merged IASI/SEVIRI product using ground-based microwave profiler data at MOL as reference. These studies will be extended.

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

- All combined SSM/I+MERIS and GOME-2 prototype months are currently reprocessed using improved SSM/I+MERIS products.
- Integration of total column of H<sub>2</sub>O from COSMIC4 water vapour profiles, in preparation to a comparison with Total Column H<sub>2</sub>O from GOME-2.

**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
- Approach for data management and functions for bulk production control of stand-alone processing system described

**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 WP has been started, and the evaluation is ongoing. First information on chain definition submitted.
- Prototype months processed on 1.5 deg ERA-interim grid.

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

- The WP has been started, and the evaluation is ongoing. Note the updated plan for AATSR.

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

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

- Reprocessing of prototype months for SSM/I + MERIS started.
- AIRS and MODIS L2 to L3 processing is ongoing.
- Validation of new IASI/SEVIRI L3 products against AIRS started.

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

- The WP has been started, and the evaluation 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

- Minor adaptations to documents, in particular ATBDs.
- Processing of test products.
- Intensify validation efforts, in particular consider Level 2 validation and inter-comparisons.
- Further investigations on added value of merged IASI+SEVIRI product compared with IASI only and SEVIRI only products at Lindenberg MOL
- Developing the processing systems.
- Continuous development on all running WP.

## Achievements

- ATBDs and validation reports in near-final version.
- The bias at coastal areas in the combined SSM/I+MERIS product could be reduced through proper consideration of aerosol impact on reflection.

## Problems encountered and solutions proposed

- The IASI assessment is on-going as mutually agreed between the project and ESA. UKMO data has been checked and corresponding reading routines implemented.
- The proposed high-temporal resolution comparisons of the IASI/SEVIRI product against ground-based microwave observations from Lindenberg has started. It is likely that no clear answer can be given whether there is an added value on monthly scales in the merged product compared with the single sensor products due to possible diurnal cycles in the single sensor products and a possible diurnal dependence of the MOL-IASI pixel collocation length due to a diurnal cycle in the cloudiness.
- The quality problems of the SSM/I+MERIS TCWV over coastal areas seem to be significantly reduced.
- The project and the GEWEX Radiation Panel jointly carry out a meeting in March 2011. The meeting, its discussions and the assessment plan might strongly affect the project. It might give reason for internal discussions which might affect future activities of the project.
- 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.