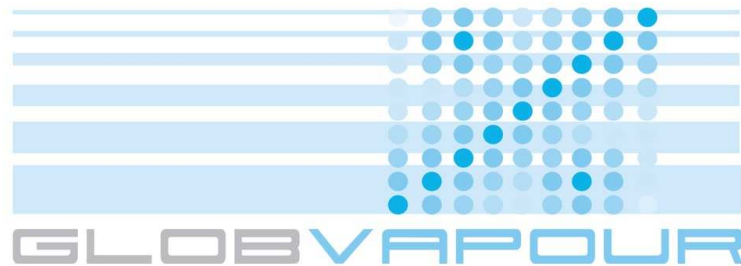




## DUE GLOBVAPOUR

### Monthly Progress Report

June 2011



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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: 01.06.2011 - 30.06.2011

**Main Accomplished Actions:**

- Test products for SSM/I+MERIS have been processed. GOME2 products for the test years 2007+2008 are also available. AATSR prototype months have been processed, as agreed upon in a separate document from January 2011.
- The initial stand-alone processing system has been designed, with the design summarized in a draft version of the processing system software design document. The combined SSM/I+MERIS processors have been successfully implemented.
- The validation of the test products for SSM/I and MERIS L3 and GOME-2 products has been carried out.
- The Product User Guide and latest versions of the Product Validation Reports have been drafted and submitted for review.
- Validation of IASI+SEVIRI L2 products against MOL data has been carried out.

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

- Organization of the next progress meeting (PM-4) in Berlin (FUB) was finalised.
- Organization of GlobVapour User Consultation Meeting has continued. UCM will take place in Oslo during the EUMETSAT Satellite Conference 2011 (afternoon of 8 September 2011). First contact to potential users/experts who might be invited has been made.
- Marc Schröder returned from parental leave and took over the project coordination from Martin Stengel.

**WP 020 - Promotion (M. Schröder)**

- Preparations for the GlobVapour Newsletter Vol. 2/2011 are ongoing.
- Minor webpage updates of e.g. dates, contact details and internal section - here, the partners have access to all (internal) documents.
- In dialogue with a new GV user Christiane Radermacher (MPI-HH). Her plan is to use the high resolution SSMI+MERIS product for model validation (REMO).

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

- Acquisition of additional GUAN and ARM data for validation of final products finalised.
- Acquisition of satellite data for validation of final products ongoing.

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

- SSM/I FCDR for years >1998 finalised by CM SAF. During the 90s processing is hampered by missing time stamp. A potential solution has been found and is currently tested. Finalisation expected soon.
- Satellite Level 1 data acquisition finalised.

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

- Modification of validation tools for a better and easier handling and implementation of more statistical validation tools.

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

- The retrieval scheme has been adapted to allow assimilation of SCIAMACHY and GOME data. Homogenisation development is ongoing.

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

- Additional validation for MERIS L2 results has been done against AERONET, RS, GPS and MWR. It exhibits a bias of <1 mm and an RMS of 1-2 mm.
- The MERIS retrieval development has been finalised.

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

- Minor issues in the MWR retrieval have been fixed (e.g., time stamp has been changed). As SSM/I the MWR retrieval has been changed to a global-hybrid version. Water vapour information is taken from climatology while other information is taken from ERA Interim.

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

- Nothing to report.

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

- The 1D-Var retrieval scheme was replaced with a statistical retrieval scheme that fully exploits the available observations, that is, all IR channels in forward and nadir view. The Look up table, that is basis for the forward operator in the TCWV retrieval over ocean has been re-calculated and extended: New principal-profiles of temperature and humidity have been extracted from 2200 GFS global datasets (between Aug. 2006 and Feb. 2011), simple cloud filtering of GFS data gives 25 Mio profiles. The corresponding RTM-simulations are used for the model uncertainty quantification.
- The sensitivity and information content studies have been re-done, using the new LUTs.
- Small sun glint distributions destroy convergence. Sun glint correction is considered to be beyond scope.
- First comparisons against SSM/I exhibit slightly improved quality relative to the 1D-Var version. However, quality is still rather low with a bias <1 mm and an RMS ~7 mm.

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

- The comparison has been extended with the deviation from the mean. Latest results of the IASI assessment will be shown at the next GlobVapour Progress Meeting.
- The processing task involving the IASI data from Lindenberg, for July and August 2007, and June and December 2008, was finished.
- Data from DLR has been included in the comparison.
- At present, conclusions can not be drawn as number of valid collocations is relatively small.

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

- The tool to validate diurnal cycles of SEVIRI single-sensor product, IASI single-sensor product and IASI+SEVIRI merged-sensor product against ground-based MWR observations has been further developed.

- The kriging error has been analysed and the background of the single sensor products was also compared to ground-based MWR observations.
- Results will be shown at PM4.

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

- The prototype products have been re-evaluated. The combined SSM/I+MERIS product exhibits increased quality at coastal areas.

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

- The development of the processing environment is well advanced and almost finalised. The final step is the drafting of a test plan which will be completed in July.

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

- Development, and delivery to Brockmann Consult, of the UCAS stand-alone processor for generating GOME/SCIAMACHY/GOME-2 L3 products.
- The development of the processing system is ongoing.

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

- The SSM/I+MERIS processor was delivered to BC and implemented successfully.

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

- Calculation of the 4 month of prototype data set has been finalised.
- The submission of the processor to BC is foreseen for August 2011.

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

- Note the proposal on IASI-SEVIRI. A final decision will be made at PM4 following discussions related to latest results from the IASI assessment and the analysis of the quality of the merged SEVIRI+IASI product.

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

- SEVIRI+IASI processing has been stopped. Next steps will depend on discussions at PM4.

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

- The MERIS-SSM/I test data set (2006-2008) has been completed at DWD (SSM/I) and at FUB (MERIS). Monthly means (MM) and Daily Composites (DC) for each 15<sup>th</sup> are available on ftp server through [www.globvapour.info](http://www.globvapour.info).
- The GOME/SCIAMACHY/GOME-2 test data set has been completed for 2007 and 2008; MM are available on ftp server. Weekly products and SCIAMACHY results for 2006 are expected end of July 2011.
- Validation of SSM/I+MERIS products for the test years (2006-2008) and of the GOME2 products for the years 2007+2008 against the diagnostic data set (DDS) was performed and is included in PVRs 2.0.
- The Product Validation Reports (PVR) have been written for SSMI+MERIS and GOME+SCIA+GOME2 and submitted for review.
- First inter-comparisons between SSM/+MERIS and GOME2 have been carried out with results being consistent with validation results.
- The Product User Guide was drafted and submitted to ESA for review.

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

- The initial stand alone processing system for the combined SSM/I+MERIS retrieval has been set-up. Currently the recently provided GOME2 L2L3 processor is implemented.
- First test products have been successfully generated.
- A technical note has been drafted which describes the design of the stand-alone processing system.

## Development of Final Product

### WP 510: Production and validation of final data set (M. Schröder)

- Processing of SSM/I and MERIS Level 2 data started. The SSM/I Level 2 product is available for 2002-2005.

### 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)

- At present the test products are transferred to ftp. Then, the comparison of GV products and climate model output will be extended.

### 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)

- Structure and content of the SEP are under discussion. SEP will benefit from UCM.

## Next Steps and Schedule

- Processing of final products.
- Finalisation of retrieval development (e.g., homogenisation for GOME/SCIAMACHY/GOME2) and implementation into processing system (AATSR and GOME/SCIAMACHY/GOME2).
- 4<sup>th</sup> Progress Meeting (06 - 07 July, FUB).
- Organization of User Consultation Meeting (Sept., Oslo) including invitations to users and experts.
- Continuous development on all running WPs.

## Achievements

- Finalization of the production of the test products for SSM/I+MERIS covering 2006-2008, for GOME2 covering 2007+2008 and prototype months for AATSR (see agreed and documented in the AATSR report from January 2011) (enabling access via GlobVapour webpage and DWD ftp-server).
- Initial stand-alone processing systems developed. Combined SSM/I+MERIS processor successfully implemented.
- Product User Guide, Product Validation Report for test products have been drafted and submitted for review.
- The Processing System Software Design document has been drafted and will be submitted soon.

- Retrieval development is finalised, except for homogenisation of GOME/SCIAMACHY/GOME2 products.

### Problems encountered and solutions proposed

- The GOME/SCIAMACHY/GOME-2 test products cover the test years 2007+2008. Weekly products and products for 2006 are expected to be available in July 2011.

The homogenisation of the GOME/SCIAMACHY/GOME2 time series is work in progress. It is anticipated that an ATBD update can be ready in August 2011 and final products can be expected in October 2011. If needed an update of the processing system requires minor adaptations only.

- Due to the large differences in the availability of IASI data and due to the relative strict clear-sky criteria used, the total number of point in time for the various retrieval provide a valid retrieval result is limited. Therefore, it was decided to base the IASI retrieval evaluation on statistics taken over all IASI assessments months per reference site, instead of separating the different months. Nevertheless, the number of valid collocations is rather small, and it seems to be beneficial to include more stations and/or months.
- Though the full information content of AATSR has been used, the RMS of the AATSR prototype products is relatively large, that is, ~7 mm (against SSM/I for ocean and sun-glint free areas). This is not surprising as AATSR was optimised for the retrieval of sea surface temperature. Therefore, channels were selected so that the atmospheric effect, including water vapour, on the observed radiances is minimal.
- The added value of the merged SEVIRI+IASI product was analysed. The diurnal cycle of the (theoretical) kriging error and the bias and RMS against ground-based microwave radiometer observations from Lindenberg, Germany were analysed. An added value would be present if a maximum quality at IASI overpass time could have been observed. This was not the case, nor in the kriging error not in the validation against MOL data. Conclusions will be discussed at PM4.
- Theo Steenbergen will leave the project by 15 August 2011. Recruitment of a new scientist for 3-4 months is not possible. Nearby universities will be contacted to assess the possibility to start short term working contracts.