

International Team

Assimilation of Envisat data (ASSET): Analyses intercomparison project

W.A. Lahoz *et al.*

Final report

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Summary.

The ASSET (Assimilation of Envisat data; <http://darc.nerc.ac.uk/asset>) project was an EU-funded consortium bringing together the leading data assimilation (DA) groups in Europe. Its objectives were: (1) assess the strategies for exploiting research satellite data by the Numerical Weather Prediction (NWP) community, and (2) investigate the distribution and variability of atmospheric chemical species by exploiting research satellite data. To address these objectives, ASSET assimilated Envisat observations and produced quality-controlled analyses of ozone and other species using a variety of assimilation models and techniques. To evaluate these analyses and the different assimilation approaches, ASSET carried out an analyses intercomparison project.

As part of its activities, ASSET submitted a successful proposal to ISSI for an “International Team”, based on the core ASSET Principal Investigator (PI) and Project Advisory Group (PAG) membership. This “International Team” met three times at ISSI: March 2006, September 2006 and May 2007. An output of these meetings has been several papers associated with the ASSET project. These papers are already published, submitted or in preparation.

Report.

Team 1: 13-17 March 2006

Attendance list: W.A. Lahoz (U. Reading, UK; ASSET co-ordinator), D. Jackson and H. Thornton (Met Office, UK), N. Bormann (ECMWF, UK), S. Massart (CERFACS, FR), A. Segers (KNMI, NL), S. Bekki and S. Rharmili (SA, FR), Q. Errera (BIRA-IASB, BE), H. Elbern (U. Koeln, DE), S. Ceccherini (CNR-IFAC, IT), M. Ridolfi (U. Bologna, IT), T. von Clarmann (IMK-Karlsruhe, DE), A. Vik and T. Krognes (NILU, NO), O. Talagrand (LMD, FR; ASSET PAG), B. Khattatov (Fusionnumerics, US; ASSET PAG).

At this meeting, four themes for publications were identified: ASSET overview (W.A. Lahoz lead); ozone intercomparison (S. Massart lead); humidity intercomparison (H. Thornton lead); NO₂ intercomparison (Q. Errera lead). Work was started on all these themes.

At the meeting, opportunities to collaborate in other themes were taken. An example concerns the evaluation of MIPAS data, which resulted in a paper submitted to ACPD (Ridolfi *et al.* 2007).

Three seminars were given at the meeting: O. Talagrand: “Theory of data assimilation”; B. Khattatov: “Improving GPS accuracy via real-time ionospheric data assimilation”; W.A. Lahoz: “Data assimilation applications: The ASSET project”.

Team 2: 11-15 September 2006

Attendance list: W.A. Lahoz (U. Reading, UK; ASSET co-ordinator), D. Jackson and H. Thornton (Met Office, UK), S. Massart (CERFACS, FR), A. Segers (KNMI, NL), D. Cugnet and S. Rharmili (SA, FR), Q. Errera (BIRA-IASB, BE), H. Elbern (U. Koeln, DE), Y. Orsolini (NILU, NO).

At this meeting, the ASSET overview theme was consolidated into a paper that was submitted soon afterwards. This paper is now published (Lahoz *et al.* 2007a). The ozone, humidity and NO₂ themes continued to collaborate toward writing papers.

Also, at this meeting, two new collaborations were started: (i) W.A. Lahoz and Y. Orsolini, on studying stratosphere-mesosphere interaction using Envisat and meteorological data; (ii) D. Jackson and Y. Orsolini, on using data assimilation ideas to quantify stratospheric ozone loss.

Team 3: 14-18 May 2007

Attendance list: W.A. Lahoz (U. Reading, UK; ASSET co-ordinator), D. Jackson (Met Office, UK), S. Massart (CERFACS, FR), S. Rharmili (SA, FR), Y. Orsolini (NILU, NO)

At this meeting, a review paper on stratospheric constituent data assimilation was finished. This paper has been submitted and has appeared in ACPD (Lahoz *et al.* 2007b).

At this meeting, further progress was taken on the ozone and humidity themes. S. Massart and Q. Errera presented work on ozone and NO₂ intercomparisons, respectively, at the Envisat Symposium in Montreux (Massart *et al.* 2007; Errera *et al.* 2007). Finally, more work was done on the collaborations between W.A. Lahoz and Y. Orsolini, and D. Jackson and Y. Orsolini. One paper has been submitted (Jackson and Orsolini 2007); other papers are expected to be submitted later in 2007.

Conclusions.

The ISSI experience has been regarded as excellent by all attendants from the ASSET “International Team”. The facilities, support and venue are first-rate. ISSI is strongly encouraged to promote its facilities among the Earth Observation community.

References.

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