

 SCIAMACHY	<h1>Operation Change Request</h1>		OCR No: 022 Issue: A
Title: Vertical Sampling of 1.6 km during TROCCINOX-2 campaign			
<p><u>Description of Request:</u></p> <p>End of January till end of February 2005 a large international campaign (TROCCINOX-2, http://www.pa.op.dlr.de/troccinox/) - involving the GEOPHYSICA and the DLR Falcon aircrafts and lead by DLR IPA - will be performed in Brazil to improve on the knowledge about lightning-produced NO_x (LNO_x) in tropical thunderstorms and to improve the current knowledge on the occurrence of other trace gases (including water vapour) and particles (ice crystal and aerosols) in the upper troposphere and lower stratosphere. SCIAMACHY data can significantly contribute to the TROCCINOX objectives by measuring above cloud NO₂, H₂O and particles (cirrus, liquid water, aerosol) in the tropical upper troposphere and lower stratosphere (UTLS). As the region of interest is characterised by large convective cloud systems which partially will be within the line-of-sight (LOS) of SCIAMACHY, this effect needs to be minimised to improve on the number of cloud free observations at the tropopause and to improve the knowledge of the cloud top height.</p> <p>It is therefore proposed to double the vertical sampling (3.3 km -> 1.6 km) in limb mode for the time period of 29.1.2005 (start of TROCCINOX local flight in Brazil) until 22.2.2005 (last opportunity for local flights, dates are based on the schedule from Nov. 11, 2004, see attachment).</p> <p>This mode was already successfully tested within OCR 14. In addition to more cloud free LOS observations, this data will help also to better quantify the impact of clouds on UTLS limb trace gas retrieval with the nominal vertical sampling, which is of importance for the projects ZTT, SCOUT and QUANTIFY.</p>			
Originator: C. Schiller (FZ Jülich), H. Schlager (DLR IPA), H. Bovensmann (IFE/IUP)	Date of Issue: 16 Dec 2004	Signature: via e-mail 16.12.2004 H. Bovensmann	
Assessment of SSAG (necessary for requests by scientists): The implementation of the change is recommended. It is recommended to check with data processing that the data can be processed up to level 1 within the NRT chain without complications.			
SSAG: H. Bovensmann	Date: 16 Dec. 2004	Signature: via e-mail 16.12.2004 H. Bovensmann	
Classification of OCR:			

OCR Analysis (incl. Implementation Option):

This OCR can be implemented in 2 ways:

Option 1:

At the beginning of the campaign in orbit 15244, the limb step width is reduced by a factor 2 by modifying the scanner state table (parameter: relative_scan_profile_1_factor set from '6' to '3') of the wide swath limb states ID 28-33. In total 6 CTI parameter tables are required. At the end of the campaign in orbit 15603, this parameter is set back to its nominal value ('6'). For a period of 25 days all limb measurements are executed with the reduced step size. The maximum limb altitude at the end of the scans will be about 47 km.

Option 2:

The parameter modification described above is executed only for those orbits which lead over Brazil (typically 1 orbit/day). This requires to generate, submit to ESOC, uplink and execute 6 CTI tables with modified parameters each day and command SCIAMACHY back to the nominal limb step width with another set of 6 CTI tables each day. Within the time interval of the campaign this amounts to 25x6x2 CTI parameter tables. For a period of 25 days only the limb measurements in orbits passing over Brazil are reduced in step size. All other orbits show nominal limb measurements.

It is possible to finetune both options further. Since over Brazil only limb state ID 32 is executed, it might be preferred only to modify the relative_scan_profile_1_factor of this limb state, either in option 1 or option 2. In that case all limb states except state ID 32 would be nominal. If option 1 is fine-tuned this way (1b) then the limb states between latitude 30° and -60° are with a reduced step width for the duration of the campaign. Only 2 CTI parameter tables are required to implement OCR_022. If option 2 is finetuned (2b), then only limb state ID 32 in the orbits where ENVISAT's sub-satellite track crosses Brazil has the modified step size. A total of 25x1x2 CTI parameter tables has to be handled.

No change in data rate is expected. How the data processors deal with modified limb step width within an orbit or between orbits is beyond our knowledge. The decision which option to implement should be made until January 15th at the latest in order to provide ample time for CTI parameter table generation, particularly if option 2 without finetuning is selected.

SOST: M. Gottwald, DLR-IMF	Date: 20/12/2004	Signature: via e-mail 20/12/2004
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Approval of Proposed Implementation:

Option 1b (limb step width only reduced in limb state ID 32) is the preferred option from scientific point of view as it addresses the requested change, it will yield a consistent data set between 30°N and 60° S w.r.t. limb step width and it will allow to continue upper atmosphere observation in high southern latitudes at the end of the SH NLC season.

In case the operational processor (0-1, and 1-2) has problems to process orbits with changing limb step width within an orbit, also option 1(a) is acceptable.

Originator Approval: i.V. H. Bovensmann	Date: 4.1.2005	Signature: via e-mail 04/1/2005
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SSAG Approval: H. Bovensmann	Date: 4.1.2005	Signature: via e-mail 04/1/2005
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Decision / Approval:

The proposed option 1b shall be implemented.

DLR Approval: Ch. Chlebek	Date: 2005-01-14	Signature: via e-mail 2005-01-14
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Implementation by SOST:

Two CTI-files have been transmitted to ESOC for implementation of OCR_22 option 1b and restoration. The validity times are January 29th, 00:49 UTC = orbit 15244 (switch to reduced step height in state 32) and February 23rd, 02:41 UTC = orbit 15603 (switch to nominal step height in state 32).

SOST E.Krieg	Date: 17.01.05	Signature: via e-mail 17.01.05
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