SCIAMACHY	Operation Change Request	OCR No: 046 Issue:

Title:Changing Integration Time for cluster 16 an 18 (channel 3) to 0.25 or shorter – starting as soon as possible from 12 June 2010 onwards

Description of Request:

We wish a higher spatial resolution for clusters 16 and 18 (channel 3) with the same short integration time as for cluster 17 (0.25 or better) as it has been successfully applied for OCR 32, OCR 35, OCR 39, OCR41 and OCR 42 in 2007, 2008, 2009 and 2010. Results (see attached Figure 1) from analysing SCIA data clusters 9, 15, 16, 17, 18 from these OCR time periods with PhytoDOAS retrieval (see Bracher et al. 2009) show that by including in the analysis cluster 16-18 we can differentiate further the phytoplanktom group of cyanobacteria into Prochlorococcus and Synechococcus type cyanobacteria. This is possible because by having the same spatial resolution for clusters 16 and 18, we can use the entire data set from ~530 to 595 nm and resolve by this the phycoerythrine (a pigment which almost only appears in Synecho-coccus-type cyanobacteria) absorption within this wavelength range. In normal operation the integration time in clusters 16 and 18 is around 1, not enough to get highly spatially resolved results for further phytoplankton modelling approaches. With resolving the different types of cyanobacteria which have different functions within the marine food web and biogeochemical cycles, global phytoplankton biomass estimates and marine nutrient flux studies can be much improved. In addition also the integration times for cluster 9 (channel 2) and 15 (channel 3) should also not be larger than 0.25 because we need this information for calculating phytoplankton group concentrations from the DOAS-fits of phytoplankton and also for distinguishing other phytoplankton groups.

This OCR requires the modifications described above for the Arctic Atlantic Ocean campaign between 12 June and 31 July 2010 (on Research Vessel Polarstern, ARKXXV-1 and -2). It is sufficient to full-fill the above requirements for solar zenith angles smaller 70°.

Note: Since GOME-2 is degrading so fast that a data base for these phytoplankton groups can not be built up from today, we envisage to raise another OCR in the near future to permanently modify the particular integration times in channel 3.

Originator:Astrid Bracher	Date of Issue: 2010-06-07	Signature:A. Bracher by email 2010-06-07

Assessment of SSAG (necessary for requests by scientists):

The proposed OCR will allow to derive new information on phytoplankton groups, and the OCR is therefore recommended to be implemented.

SSAG: H. Bovensmann	Date: 7.6.2010	Signature: via e-mail, 7.6.2010

Classification of OCR:

OCR Analysis (incl. Implementation Option):
The following analysis is identical to that of OCR_042 executed in April/May 2010. A reduction of the integration times below 0.25 s would have a major impact on the data products and is not considered to be feasible. Therefore the implementation concentrates on achieving an integration time of 0.25 s for clusters 9, 15, 16, 17 and 18.

The OCR can be implemented by modification of the co-adding tables for the nadir states N6 (state ID 6) and N7 (state ID 7). Reduction of the integration time for clusters 16 & 18 can be achieved by reducing the co-adding factors for these clusters from 16 to 4, resulting in an integration time of 0.25 s. There is no need to modify co-addings for clusters 9, 15 & 17 for states N6 and N7 as these already have 0.25 s integration time.

A reduction of the co-adding factors results in an increase of the data rate above the allowed limit of about 390000 bits/s. To compensate for this it is necessary to increase the co-adding factors (and thus reducing spatial resolution) in other clusters.
(Note: an integration time of 0.25 s corresponds to a spatial resolution of about 30km x 60 km, 1 s to about 30km x 240 km.)

Increase integration times of “non-special” clusters in channel 7 (48, 49, 51, 53) and blinded pixels in channel 6 (36, 47) to 5 s. Coadding tables 26 and 27 will be modified accordingly (see annex 2). The co-addings for clusters 16 & 18 are set to 4 as described above.

The implementation involves CTI-tables only and requires no particular scheduling of specific timelines.

SOST: M. Gottwald/E. Krieg, DLR-IMF (ESA, Industry if necessary)	Date: 07/06/2010	Signature: via e-mail 07/06/2010

Approval of Proposed Implementation:		
Originator Approval: Astrid Bracher	Date: 07/06/2010	Signature: via e-mail 07/06/2010
SSAG Approval: H. Bovensmann	Date: 7.6.2010	Signature: e-mail 7.6.2010

Decision / Approval:
Shall be implemented as recommended.

DLR Approval: Achim Friker (if necessary NIVR, SPEC)	Date: 07 June 2010	Signature: via E-Mail 07 June 2010

Implementation by SOST:
Validity of the modified co-adding tables 26 and 27 will start in orbit 43306 (12th June 2010) at 10:40:00 UTC.
Return to nominal operation will be effective from orbit 44016 (1st August 2010, about 01:06:00 UTC) onwards.

SOST: M. Gottwald/E. Krieg, DLR-IMF	Date: 07/06/2010	Signature: via e-mail 07/06/2010

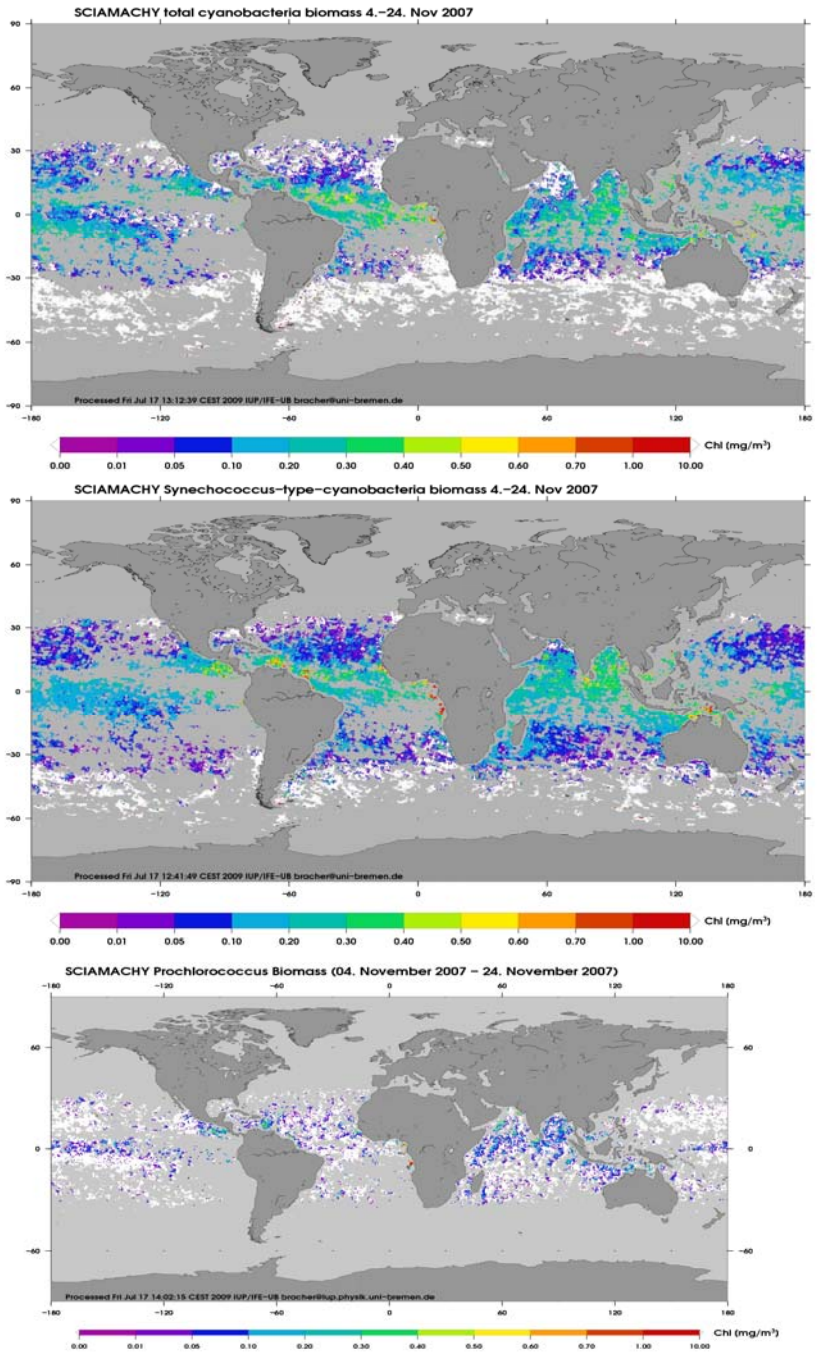

Figure 1: Mean global biomass (in chl-a conc.) of all cyanobacteria (upper panel), Synechococcus-type-cyanobacteria (middle panel) and Prochlorococcus (lower panel) in Nov 2007 (during OCR 32) determined by PhytoDOAS from SCIAMACHY data from Fits within the range of clusters 9, 15, 16, 17 and 18. White pixels signify no correlation with the absorption of the specific phytoplankton group spectrum and therefore SCIAMACHY pixels without any biomass of this group.