 SCIAMACHY	<h2>Operation Change Request</h2>		OCR No: 039
			Issue: A
<p>Title: Changing Integration Time for cluster 16 and 18 (channel 3) for 5 November 2008 to 2 December 2008 to 0.25 or shorter for nadir - same changes as in OCR_032 and OCR_035</p>			
<p>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 OCR32 last year. First results show from analysing SCIA data from Nov 2007 and indicate that the former operation change OCR 032 (and also OCR 35) was successful (see Figure 1 attached): we can with using the entire data set from ~530 to 595 nm for DOAS analysis resolve the absorption of the phycoerythrin-containing <i>Synechococcus</i> (a dominating phytoplankton species in tropical areas) and distinguish the global abundance of this species with a much better coverage and higher spatial resolution. With resolving <i>Synechococcus</i> distributions from SCIAMACHY data, this enables to distinguish this species from other cyanobacteria species and helps to improve phytoplankton biomass estimates and marine nutrient flux studies.</p> <p>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. 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. We choose the time of Nov 5 to Dec, 2 2008, because then we are measuring online in the Atlantic Ocean between 20°N and 25°S in situ phytoplankton characteristics during a ship cruise (on Research Vessel Polarstern, Ant XXV-1) which are necessary data for validation of these specific phytoplankton retrieval. It is sufficient to fulfill the above requirements only for solar zenith angles smaller 60°.</p>			
Originator Astrid Bracher	Date of Issue: 2008-09-16	Signature: A. Bracher by email 2008-09-16	
<p>Assessment of SSAG (necessary for requests by scientists): The execution of OCR39 for the time frame 5.11. - 2.12.2008 is recommended as it improves Chlorophyll retrieval significantly and operational products are not affected.</p>			
SSAG: H. Bovensmann, IFE	Date: 16/09/2008	Signature: via e-mail 16/09/2008	
<p>Classification of OCR: D</p>			

OCR Analysis (incl. Implementation Option):

The following analysis is identical to that of OCR_035 executed in April 2008. 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 5s. 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

Since the implementation involves CTI-tables only and no MPS-activities the proposed timeslot November 5, 2008 to December 2, 2008 can be met. We will upload the modified CTI parameter tables in orbit 34941 (November 05, 2008) and switch back to the final flight configuration in orbit 35341 (December 03, 2008).

SOST: M. Gottwald, E. Krieg, DLR-IMF (ESA, Industry if necessary)	Date: 17/09/2008	Signature: via E-mail 17/09/2008
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Approval of Proposed Implementation:

Originator Approval: Astrid Bracher	Date: 28/10/2008	Signature: via e-mail, 28/10/2008
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SSAG Approval: H. Bovensmann	Date: 01/10/2008	Signature: via e-mail, 01/10/2008
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Decision / Approval:

It is recommended to implement this OCR in the same way as already successfully tested to work for OCR_032 and OCR_035. Data users need to be informed in advance on this temporary change of integration times (Action ESA).

DLR Approval: (if necessary NIVR, SPEC)	Date: 28/10/2008	Signature: via e-mail, 28/10/08
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Implementation by SOST:

The coadding tables 26 and 27 will be modified as specified in tables N6 and N7 of annex 2.

Start orbit for the execution of OCR_039 is 34940 (November 05, 00:01 UTC), Stop orbit will be 35341 (December 03, about 00:23 UTC).

SOST: M. Gottwald, DLR-IMF	Date: 29/10/2008	Signature: via e-mail 29/10/2008
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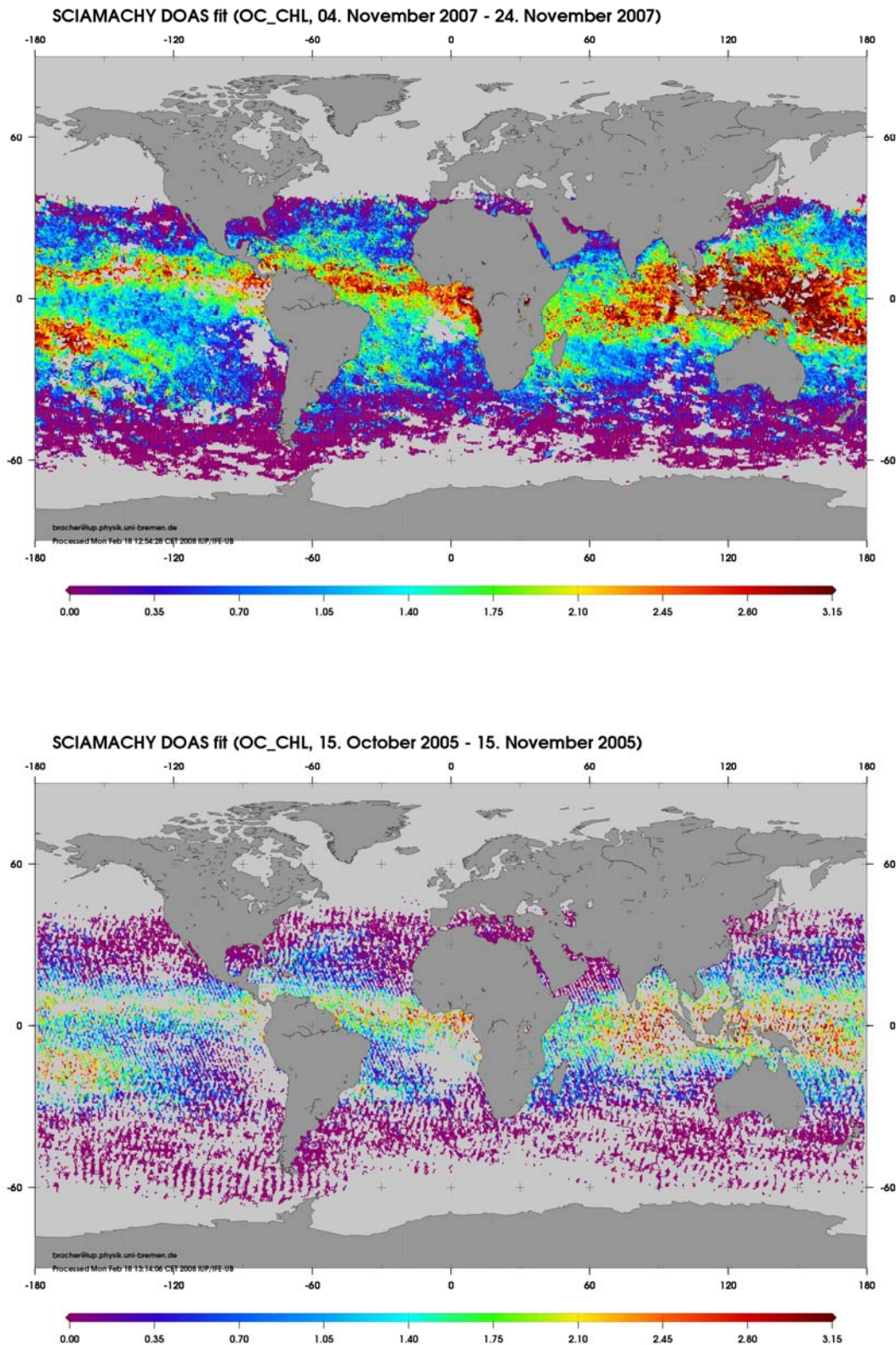


Figure 1: Mean of global distribution of absorption by phycoerythrin-containing cyanobacteria retrieved by DOAS from SCIAMACHY measurements at 530 to 595 nm. Upper panel: from 4 to 24 Nov 2007 (during OCR 32) with the same integration times at clusters 16 to 18. Lower panel: from 15 Oct to 14 Nov 2005 with varying integration times at clusters 16, 17, and 18

Annex 2:

Summary of results							N6
State							N6
Cluster Ind.	Description	min/max wavelength , nm		Channel	Coadding	PET (s)	Int. Time(s)
1	Blinded Pixel	212,53	213,14	1a	1	1	1
2	straylight	213,29	239,88	1a	1	1	1
3	virtual channel 1a	240,00	281,90	1a	1	1	1
4	virtual channel 1b	282,01	303,54	1b	1	0,25	0,25
5	overlap region, PMD 1	303,65	313,92	1b	1	0,25	0,25
6	Blinded Pixel	333,92	334,37	1b	4	0,25	1
7	Blinded Pixel	412,18	411,74	2b	4	0,25	1
8	overlap region 2b	403,96	391,87	2b	4	0,25	1
9	UV DOAS, PMD 1	391,76	320,14	2b	1	0,25	0,25
10	overlap region 2a, UV DOAS, PMD 1	320,02	309,43	2a	1	0,25	0,25
11	Blinded Pixel	301,06	300,59	2a	4	0,25	1
12	Blinded Pixel	383,56	385,84	3	16	0,0625	1
13	overlap region	391,88	404,10	3	16	0,0625	1
14		404,34	423,73	3	16	0,0625	1
15	VIS DOAS, PMD 2	423,97	526,96	3	4	0,0625	0,25
16		527,20	544,56	3	4	0,0625	0,25
17	AE	544,80	565,08	3	4	0,0625	0,25
18		565,31	597,28	3	4	0,0625	0,25
19	overlap region	597,52	605,48	3	16	0,0625	1
20	Blinded Pixel	627,41	628,40	3	16	0,0625	1
21	Blinded Pixel	595,36	596,26	4	16	0,0625	1
22	overlap region	597,60	605,43	4	16	0,0625	1
23		605,65	612,53	4	16	0,0625	1
24	PMD 3, AE	612,75	725,99	4	4	0,0625	0,25
25		726,19	753,77	4	16	0,0625	1
26	O2(A)	753,98	775,92	4	4	0,0625	0,25
27	overlap region	776,13	789,85	4	16	0,0625	1
28	Blinded Pixel	811,47	812,33	4	16	0,0625	1
29	Blinded Pixel	773,21	774,43	5	4	0,25	1
30	overlap region	776,24	789,74	5	4	0,25	1
31		790,04	798,06	5	4	0,25	1
32	PMD 4/7, AE	798,35	946,62	5	1	0,25	0,25
33		946,90	990,40	5	4	0,25	1
34	overlap region, (AE)	990,68	1056,25	5	2	0,25	0,5
35	Blinded Pixel	1061,68	1062,83	5	4	0,25	1
36	Blinded Pixel	971,46	978,74	6	8	0,125	1
37	overlap region	990,84	1056,23	6	4	0,125	0,5
38		1057,02	1233,24	6	8	0,125	1
39	AE	1234,01	1253,14	6	2	0,125	0,25
40		1253,90	1388,96	6	8	0,125	1
41	Water Vapour	1389,72	1410,36	6	2	0,125	0,25
42		1411,12	1548,51	6	8	0,125	1
43	Water/Ice cloud & PMD 5	1549,30	1670,70	6	2	0,125	0,25
44		1671,51	1695,84	6	8	0,125	1
45	add. Water/Ice cloud	1696,65	1707,26	6	2	0,125	0,25
46		1708,08	1750,09	6	8	0,125	1
47	Blinded Pixel	1765,07	1772,59	6	8	0,125	1
48	Blinded Pixel	1934,38	1935,44	7	10	0,5	5
49		1939,99	1967,79	7	10	0,5	5
50	CO2	1967,90	1984,05	7	1	0,5	0,5
51		1984,15	2029,89	7	10	0,5	5
52	CO2, H2O	2029,99	2040,19	7	1	0,5	0,5
53	Blinded Pixel	2042,80	2043,67	7	10	0,5	5
54	Blinded Pixel	2259,26	2260,47	8	2	0,5	1
55	PMD 6, Ch. 8, unused pixel	2260,61	2384,49	8	1	0,5	0,5
56	Blinded Pixel	2384,60	2385,61	8	2	0,5	1
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64							
Total Data Rate (bit/s, including Headers, PMD /Auxiliary Data)							386333

Summary of results

N7

State		N7					
Cluster Ind.	Description	min/max wavelength , nm		Channel	Coadding	PET (s)	Int. Time(s)
1	Blinded Pixel	212,53	213,14	1a	5	1	5
2	straylight	213,29	239,88	1a	1	1	1
3	virtual channel 1a	240,00	281,90	1a	1	1	1
4	virtual channel 1b	282,01	303,54	1b	2	0,25	0,5
5	overlap region, PMD 1	303,65	313,92	1b	1	0,25	0,25
6	Blinded Pixel	333,92	334,37	1b	20	0,25	5
7	Blinded Pixel	412,18	411,74	2b	4	0,25	1
8	overlap region 2b	403,96	391,87	2b	4	0,25	1
9	UV DOAS, PMD 1	391,76	320,14	2b	1	0,25	0,25
10	overlap region 2a, UV DOAS, PMD 1	320,02	309,43	2a	1	0,25	0,25
11	Blinded Pixel	301,06	300,59	2a	4	0,25	1
12	Blinded Pixel	383,56	385,84	3	16	0,0625	1
13	overlap region	391,88	404,10	3	16	0,0625	1
14		404,34	423,73	3	16	0,0625	1
15	VIS DOAS, PMD 2	423,97	526,96	3	4	0,0625	0,25
16		527,20	544,56	3	4	0,0625	0,25
17	AE	544,80	565,08	3	4	0,0625	0,25
18		565,31	597,28	3	4	0,0625	0,25
19	overlap region	597,52	605,48	3	16	0,0625	1
20	Blinded Pixel	627,41	628,40	3	16	0,0625	1
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22	overlap region	597,60	605,43	4	16	0,0625	1
23		605,65	612,53	4	16	0,0625	1
24	PMD 3, AE	612,75	725,99	4	4	0,0625	0,25
25		726,19	753,77	4	16	0,0625	1
26	O2(A)	753,98	775,92	4	4	0,0625	0,25
27	overlap region	776,13	789,85	4	16	0,0625	1
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46		1708,08	1750,09	6	8	0,125	1
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49		1939,99	1967,79	7	10	0,5	5
50	CO2	1967,90	1984,05	7	1	0,5	0,5
51		1984,15	2029,89	7	10	0,5	5
52	CO2, H2O	2029,99	2040,19	7	1	0,5	0,5
53	Blinded Pixel	2042,80	2043,67	7	10	0,5	5
54	Blinded Pixel	2259,26	2260,47	8	10	0,5	5
55	PMD 6, Ch. 8, unused pixel	2260,61	2384,49	8	1	0,5	0,5
56	Blinded Pixel	2384,60	2385,61	8	10	0,5	5
57							
58							
59							
60							
61							
62							
63							
64							
Total Data Rate (bit/s, including Headers, PMD /Auxiliary Data)							390784

The maximum data rate of 390000 bits/s is slightly exceeded. This is considered to be uncritical since nadir states with data rates up to 391034 bits/s have already been run successfully.