SCIAMACHY QWG-3 Meeting #3

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Reprocessing activities

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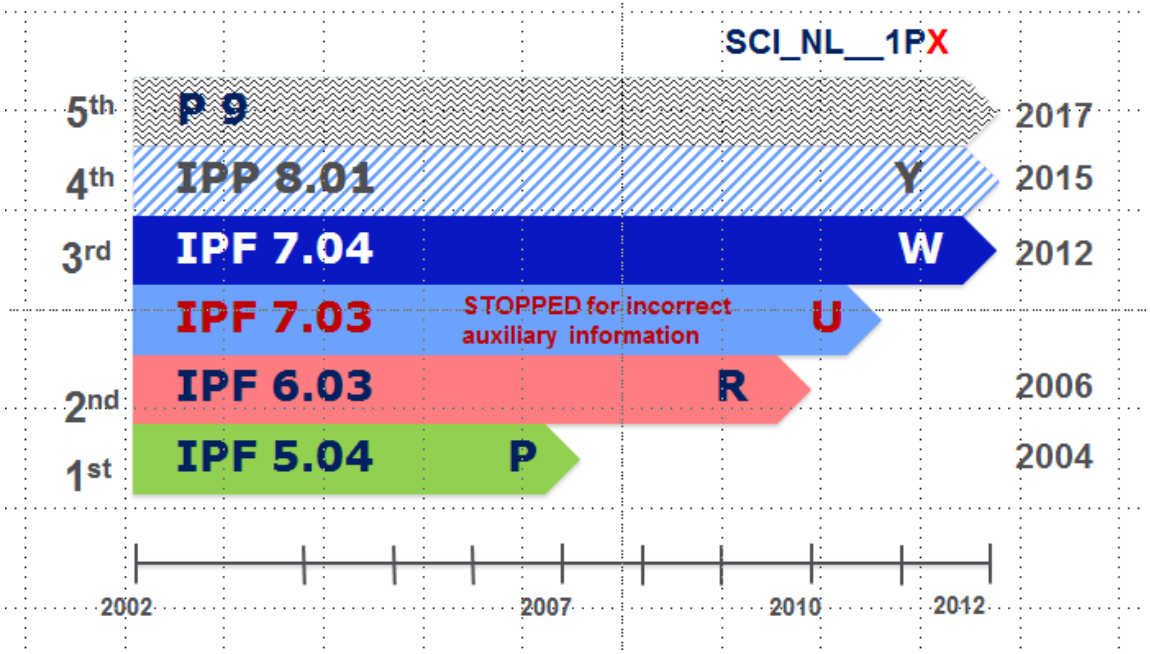
Level 1b reprocessing



- Completed (from mid-Dec 2014 to mid-Feb 2015)
- Dataset v8.01-Y available since 18 February 2015
- Data on D-PAC FTP server eoa-dp.eo.esa.in
- 47503 Level 1b files, for a total size of ~16.4 TB
- Compressed for future distribution (gzip ~ -40%)

Level 1b reprocessing

	cL0	L1b generated	failures
2002	1857	1754	103
2003	4761	4667	94
2004	5070	4948	122
2005	5114	5017	97
2006	4829	4761	68
2007	5033	4947	86
2008	5155	5080	75
2009	5046	4964	82
2010	4977	4955	22
2011	5072	5051	21
2012	1363	1359	4
	48277	**47503**	**774 (<2%)**

Failures for

- anomalies in cL0 data (e.g. corrupted ISP)

→ IPP v8.01 less tolerant to corrupted measurements. With IPF v7.04, problems often inherited by L1b files.

- memory limits at D-PAC

→ large cL0 files need more than 8 GB of RAM.

2nd processing round at the end of detailed analyses

Level 1b reprocessing

	v8.01	v7.04	delta
2002	1754	1817	-63
2003	4667	4713	-46
2004	4948	4995	-47
2005	5017	5030	-13
2006	4761	4797	-36
2007	4947	4996	-49
2008	5080	5144	-64
2009	4964	5024	-60
2010	4955	4972	-17
2011	5051	5058	-7
2012	1359	1357	2
	47503	**47903**	**-400**

IPP v8.01 has different behaviour wrt IPF v7.04

ΔTime in L1b not justified by differences in L0 input files:

- Different number of DARK states enclosed
- Solar occultations

Known issues 1/4

Solar occultation states

- Enclosed in v8.01 products even when incomplete (missing in v7.04)
- 115 L1b files identified (list from Klaus)
- Not formally corrupted

- Inconsistency: In 'states' GADS, the field 'dur_scan_phase' does not reflect the shortened duration of the available data but always the length of the full sequence.

Known issues 2/4

Usage of reference auxiliary files in place of calib. database

PPG/ETALON	2204 - 2215	02-AUG-2002	**Expected as DB starts with orbit 2216**
BDPM	2291 - 3069	08 AUG -> 01-OCT-2002	
	4267 - 4379	24/31-DEC-2002	
	4380 - 4461	01/06-JAN-2003	
	7672 - 7809	19/28-AUG-2003	
	9528 - 9655	26-DEC-2003 -> 04-JAN-2004	
	12123 - 12184	24/29-JUN-2004	
	14773 - 14873	27-DEC-2004 -> 03-JAN-2005	
	35672 - 35811	26-DEC-2008 -> 04-JAN-2009	

Too sparse measurements
Average bad pixel masks not available

Known issues 3/4

1085 Level 1b products do not pass the codacheck test

Some failures caused by double written BDPM DSD

- 280 additional bytes in SPH; binary part is correct
- Higher level processing is feasible
- ESA/DLR decided to leave as is

TBD - Incorrect data won’t be distributed to users.

Known issues 4/4

Bad selections of A0 SMR spectra

A0 expected to be constant up to 15 December 2002 (orbit 4144)

In case more than one database entry exists for one day, the nearest neighbour search results NOT fully deterministic. Expected impact is limited as there are A0 entries for the contiguous days.

4144 | 2002-12-15 14:11:57.354 | 2014-09-06 04:44:33 | A0
4146 | 2002-12-15 17:33:09.415 | 2014-09-06 04:45:31 | A0
4148 | 2002-12-15 20:54:21.274 | 2014-09-06 04:46:20 | A0

# orbit	# A0 selection
2204	2002-12-15 14:11:57 A0 2014-09-06 04:44:33
…	
2397	2002-12-15 14:11:57 A0 2014-09-06 04:44:33
2398	2002-12-15 17:33:09 A0 2014-09-06 04:45:31
2399	2002-12-15 17:33:09 A0 2014-09-06 04:45:31
2400	2002-12-15 20:54:21 A0 2014-09-06 04:46:20
2401	2002-12-15 20:54:21 A0 2014-09-06 04:46:20
2402	2002-12-15 14:11:57 A0 2014-09-06 04:44:33

# orbit	# A0 selection
…	
03270	2002-12-15 14:11:57_A0_2014-09-06 04:44:33
03271	2002-12-15 14:11:57_A0_2014-09-06 04:44:33
03272	2002-12-15 17:33:09_A0_2014-09-06 04:45:31
03273	2002-12-15 17:33:09_A0_2014-09-06 04:45:31
03274	2002-12-15 20:54:21_A0_2014-09-06 04:46:20
03275	2002-12-15 20:54:21_A0_2014-09-06 04:46:20
03276	2002-12-15 14:11:57_A0_2014-09-06 04:44:33

Known issues 4/4

11168 | 2004-04-19 06:46:39.775 | 2014-09-06 06:12:36 | A0
11169 | 2004-04-19 08:27:15.330 | 2014-09-06 06:13:15 | A0
11171 | 2004-04-19 11:48:26.317 | 2014-09-06 06:14:13 | A0
11172 | 2004-04-19 13:29:01.829 | 2014-09-06 06:14:38 | A0
11176 | 2004-04-19 20:12:00.699 | 2014-09-06 06:16:23 | A0

11880 | 2004-06-08 00:29:58.785 | 2014-09-06 10:20:42 | A0
11881 | 2004-06-08 02:10:34.519 | 2014-09-06 10:21:08 | A0
11882 | 2004-06-08 03:51:10.347 | 2014-09-06 10:21:34 | A0
11883 | 2004-06-08 05:31:46.284 | 2014-09-06 10:21:59 | A0
11884 | 2004-06-08 07:12:22.139 | 2014-09-06 10:22:42 | A0
11885 | 2004-06-08 08:52:57.912 | 2014-09-06 10:23:16 | A0
11886 | 2004-06-08 10:33:33.658 | 2014-09-06 10:23:56 | A0
11887 | 2004-06-08 12:14:09.373 | 2014-09-06 10:24:31 | A0
11888 | 2004-06-08 13:54:45.130 | 2014-09-06 10:24:59 | A0
11889 | 2004-06-08 15:35:20.954 | 2014-09-06 10:25:34 | A0
11891 | 2004-06-08 18:57:07.430 | 2014-09-06 10:26:17 | A0

Conclusions

- Systematic screening completed
- Some issues identified

All finding to be described into README file

SciaL1c

Current version is 3.1.5 provided on 16/03/2015

scial1c-3.1.5-x86_64-pc-linux-gnu-gcc-4.8.3-cmake

Some NCRs to be fixed with new release (3.1.6)

Ensured backward compatibility with v7.0X products

With v8.01 L1b products

calibration option Etalon is obsolete (skipped)

M-factor is not applied

New option «–compat» to force calibrations

Level 2 baseline

- Baseline v6.00 accepted by ESA on 13 February

PROC_STAGE	Y
SOFTWARE_VER	SCIA-OL/6.00

- Already used for DDS generation with modified configuration
- L2 product has a new format. Major changes wrt v5.02:
  - *AAI algorithm now uses calculated Ozone values*
  - *New cloud/ice separation*
  - *New NLCs in the Limb cloud MDS*
  - *New Nadir HCHO, CHOCHO, CH4*
  - *New Tropospheric NO2*
  - *CO retrieval now uses not radiometric calibrated spectra and adjusted fitting parameters*
  - *Extension of Limb Ozone retrieval range upwards of 45 km. Use of additional spectral window in the UV with larger exposure time brought to one profile (previously 4 profiles per scan).*
  - *Development environment from 32bit to 64bit*
  - *M-factor file not used for Level 1-2 processing step*

Level 2 baseline

Full-mission reprocessing:

- Filling of the background database is required
  (one week dedicated to this task)

- Expected processing time to be communicated by DLR

- All DDS Level 2 products will be regenerated as the DDS configuration is different from nominal Level 2 data.

Diagnostic dataset

- Part of verification strategy of new L1 processing baseline
- Orbits selected by validation teams (BIRA, KNMI)
- Level 2 version 6.00 products generated at D-PAC
- L2 DDS products have reduced content wrt nominal v6.0 L2 products

  O3, NO2, BrO limb and nadir

  CO and H2O nadir

- Available on FTP server eoa-dp.eo.esa.int
- Provided only to expert teams for validation purposes.
- Filename processing counter set to 9120

<u>Level 2 product belonging to the Diagnostic Dataset</u>

SCI_OL__2PYDPA20020701_111630_000054282007_00195_01752_9120.N1

<u>Level 2 product belonging to the Full mission reprocessing</u>

SCI_OL__2PYDPA20020701_111630_000054282007_00195_01752_0000.N1

Diagnostic dataset

- Processing failures impact the DDS
- Processing time: ~5 days

	orbits selected	L1b v8.01 unavailable	inputs for DDS generation
2002	240	12	228
2003	545	17	528
2004	530	4	526
2005	543	11	532
2006	507	8	499
2007	512	8	504
2008	507	7	500
2009	507	13	494
2010	495	0	495
2011	452	2	450
2012	173	0	173
	5011	**82**	**4929**

SPR/SCR procedure

Need to redefine/optimize procedure for software changes

Requirements from QWG before DLR implementation