

Status of the SCIAMACHY Instrument

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IFE/IUP

History

- Quasi-nominal operations since August 2002
- Remaining SODAP activities in December 2002
- Since 14 December 2002 final flight settings
- Extended decontamination period around new year
- From January 2003 on mainly nominal operations (alternating limb/nadir scenario)
- Deviations from nominal operations only possible via formal OCRs (= Operations Change Requests)
- Up to now 10 OCRs, mostly completed
- Only short interruption of nominal operations due to special measurements (max. 1 day)
- Timing of special measurements considers validation activities
- Actual status information on SOST web site:

<http://atmos.af.op.dlr.de/projects/scops/>

Data Quality History 2002 (1)

- Periods of reduced data quality Aug – Nov 2002 (during quasi-nominal operations):

- 28-31 August 2002:

Recovery from Heater/Refuse (HTR/RF);
Reason: Single Event Upset (SEU)



- 8-13 September 2002:

ENVISAT Orbit Control Manoeuvre (OCM) & Payload Management Computer (PMC) s/w patch

- 24 October 2002 (only 1 timeline):

SCIAMACHY ICU patch (Ancillary Macrocommand CCA check error)

- 17-18 November 2002:

Flash decontamination

- 18-20 November 2002:

ENVISAT switch-off because of Leonids meteor shower and Power Mechanism and Thermal Control Unit (PMTU) s/w patch

Data Quality History 2002 (2)

- Periods of reduced data quality Nov – Dec 2002 (during non-nominal operations due to remaining SODAP activities):
 - 30 November - 2 December 2002:
Recovery from Heater/Refuse (HTR/RF); Reason: Wrong parameter settings
 - 4 December 2002:
Recovery from Heater/Refuse (HTR/RF); Reason: Wrong parameter settings
 - 12 – 13 December 2002:
Recovery from Heater/Refuse (HTR/RF); Reason: Wrong parameter settings
 - 17 December 2003 – 4 January 2003:
Non-nominal decontamination
- From 2003 on data quality history tabled on SOST web site

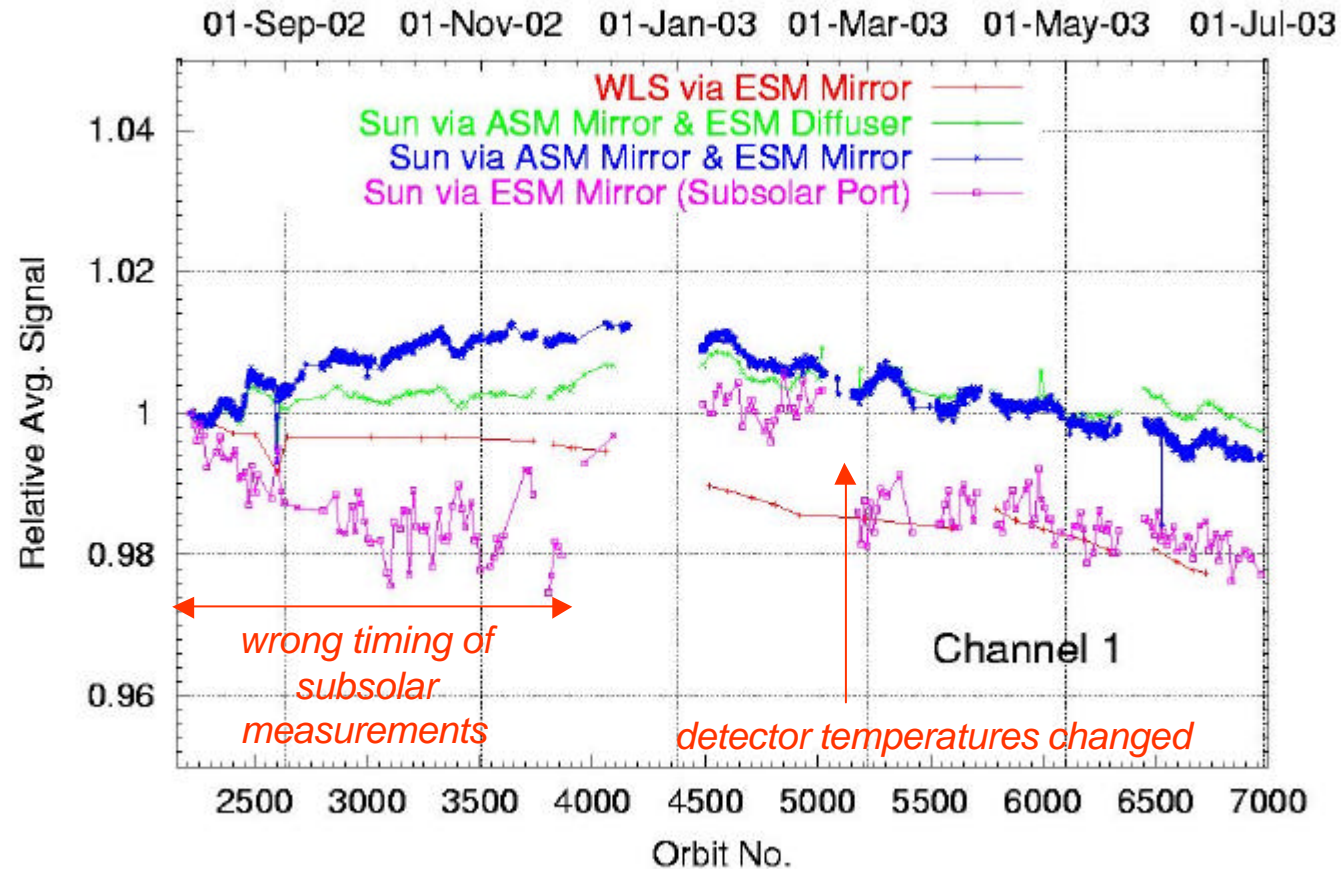
Data Quality History 2003

| Orbit | | UTC | | Event Reason |
|-------|------|----------------------|----------------------|---|
| Start | Stop | Start | Stop | |
| 4380 | 4428 | 01-JAN-2003 01:29:18 | 04-JAN-2003 11:25:42 | non-nominal decontamination |
| 4428 | 4479 | 04-JAN-2003 11:25:42 | 07-JAN-2003 23:28:35 | recovery from HTR/RF <i>SET (Single Event Transient) in PMTC (Power Mechanism & Thermal Control Unit) / ASM (Azimuth Scan Mechanism) electronics</i> |
| 5034 | 5086 | 15-FEB-2003 19:15:23 | 19-FEB-2003 09:12:04 | recovery from R/W WAIT <i>"usual" CCA Check Error</i> |
| 5099 | 5152 | 20-FEB-2003 07:27:06 | 23-FEB-2003 23:51:35 | recovery from STANDBY; monthly cal. lost <i>ENVISAT PMC (Payload Management Computer) problem</i> |
| 5207 | 5212 | 27-FEB-2003 21:32:20 | 28-FEB-2003 06:08:06 | Thermal Control (TC) re-adjustment (only channels 4 & 5 affected) |
| 5426 | 5491 | 15-MAR-2003 04:20:54 | 19-MAR-2003 17:55:10 | recovery from STANDBY <i>ENVISAT switch-off (probably cause by Artemis test)</i> |
| 5502 | 5527 | 20-MAR-2003 10:57:34 | 22-MAR-2003 06:16:43 | recovery from R/W WAIT <i>CCA Check Error (patch not loaded after last recovery)</i> |
| 5718 | 5766 | 04-APR-2003 14:12:14 | 07-APR-2003 21:19:14 | non-nominal decontamination |
| 5764 | 5773 | 07-APR-2003 18:24:16 | 08-APR-2003 09:35:06 | reduced data product quality <i>ENVISAT HSM (High Speed Multiplexer) anomalies</i> |
| 5887 | 5894 | 16-APR-2003 09:32:01 | 16-APR-2003 19:55:53 | Thermal Control (TC) re-adjustment (only channels 4 & 5 affected) |
| 6301 | 6308 | 15-MAY-2003 07:37:00 | 15-MAY-2003 18:03:47 | Thermal Control (TC) re-adjustment (only channels 4 & 5 affected) |
| 6384 | 6449 | 21-MAY-2003 02:46:18 | 25-MAY-2003 15:00:00 | non-nominal decontamination |

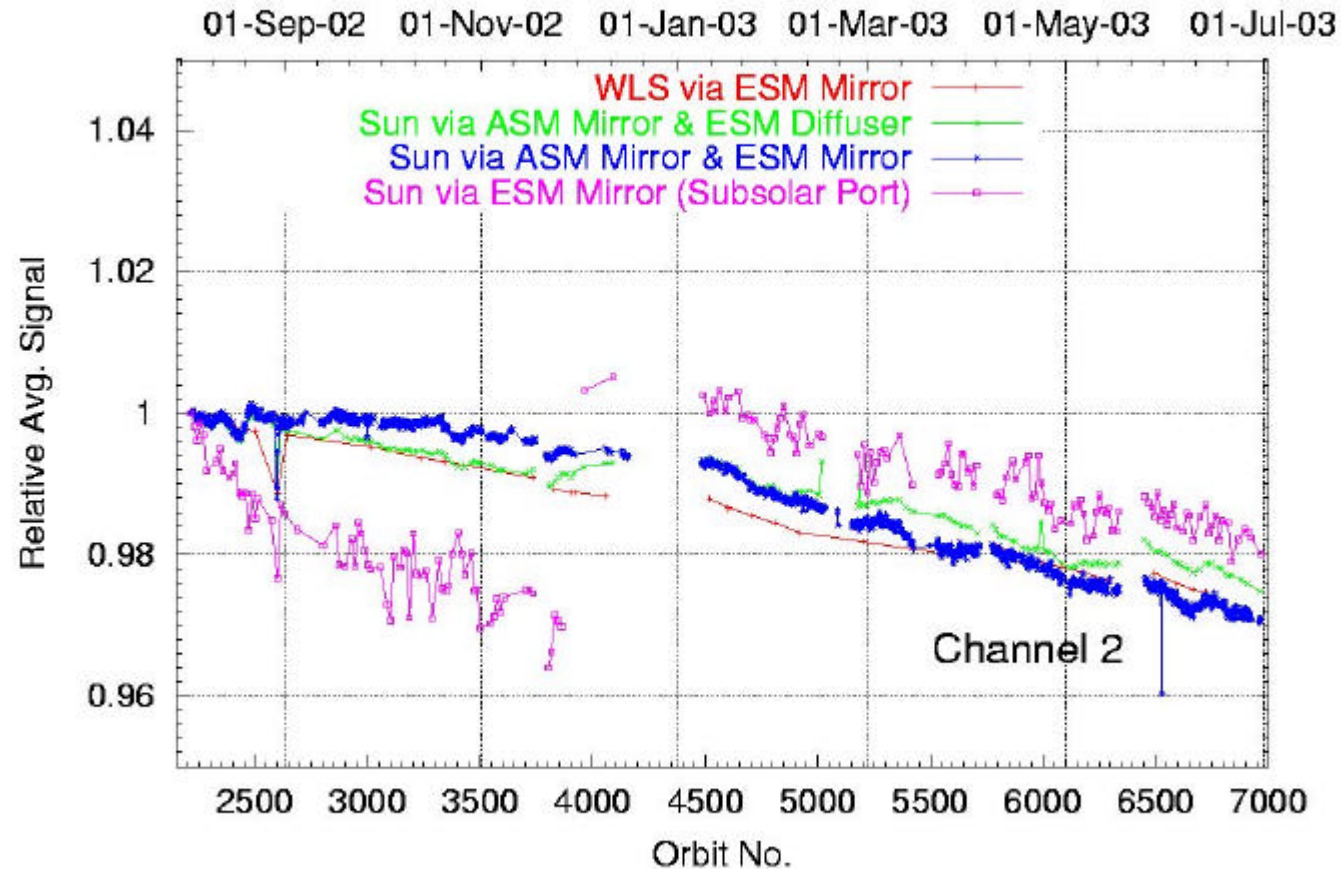
Instrument Performance Monitoring

- Operational instrument monitoring activities currently limited by Level 1 data product quality and availability
- Performance monitoring has been started based on uncalibrated (Level 0) data using own calibration routines
- Results are available for the different light paths:
 - Nadir: via ESM mirror (subsolar port)
 - Limb/occultation: via ASM & ESM mirror
 - Calibration : via ASM mirror & ESM diffuser
 - Additionally: White Light Source (WLS) via ESM mirror
 - Note: Monitoring of ASM diffuser light path not possible because of missing radiometric calibration
- Reference: 2 August 2002 (except for subsolar)

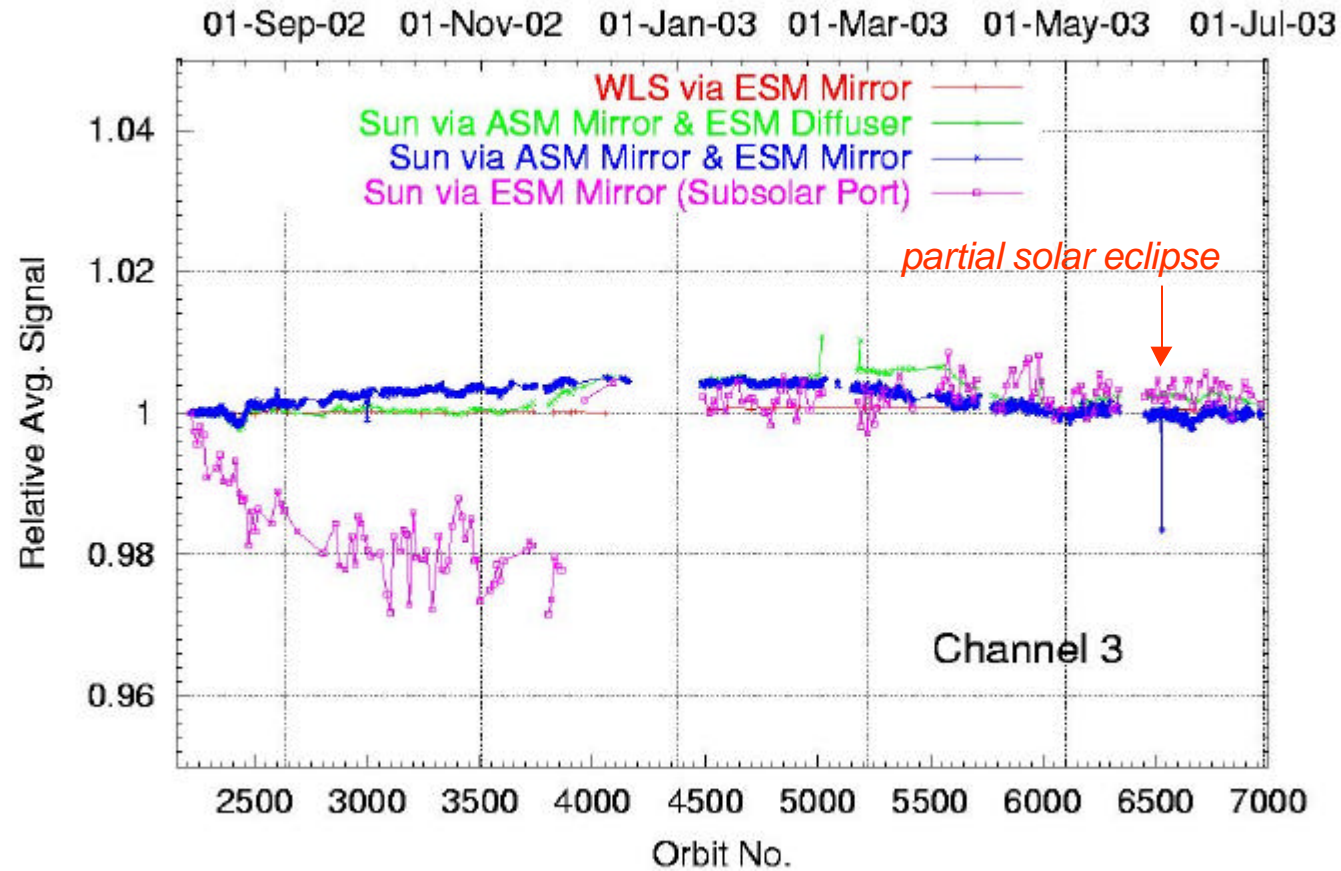
Light Path Monitoring Ch. 1



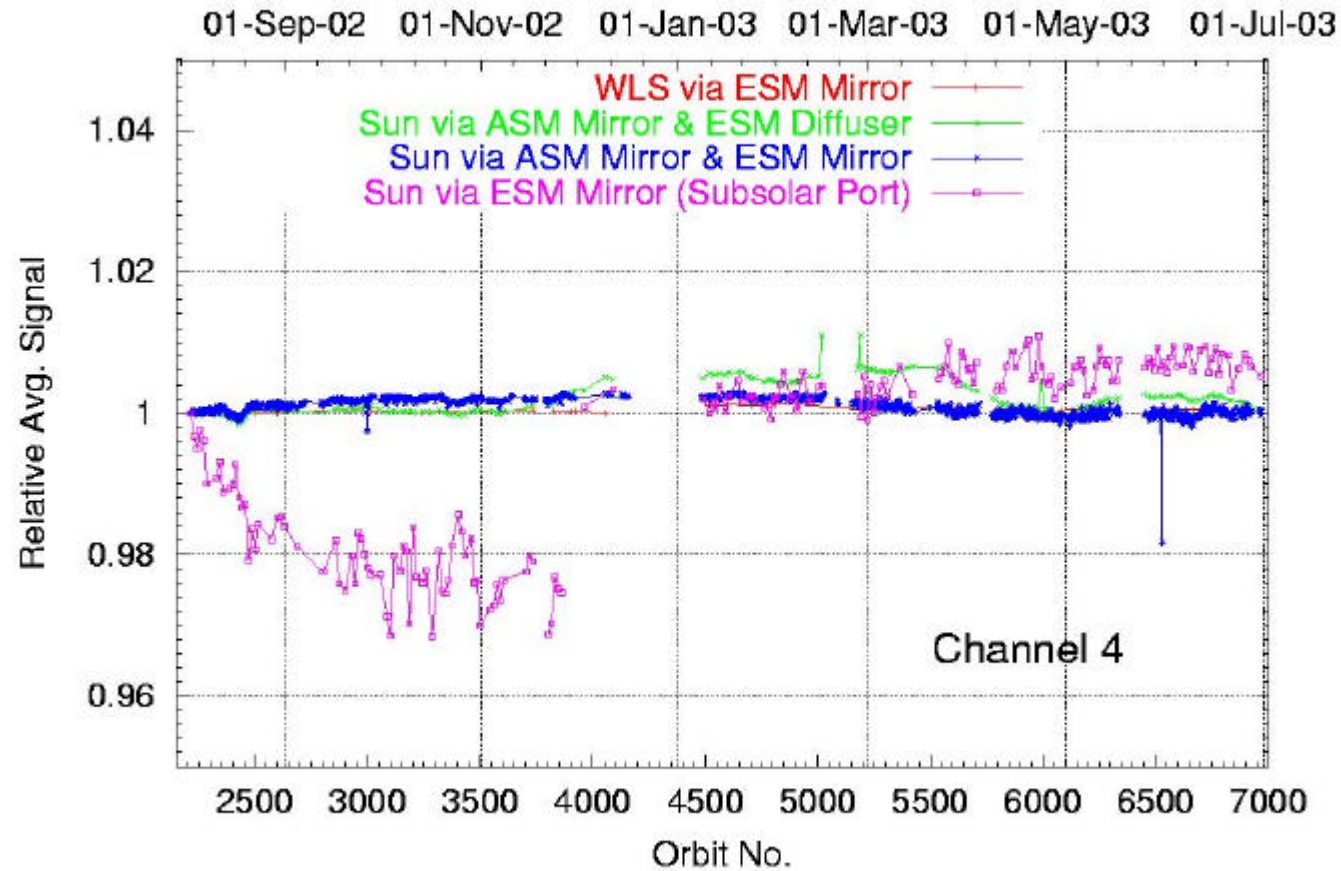
Light Path Monitoring Ch. 2



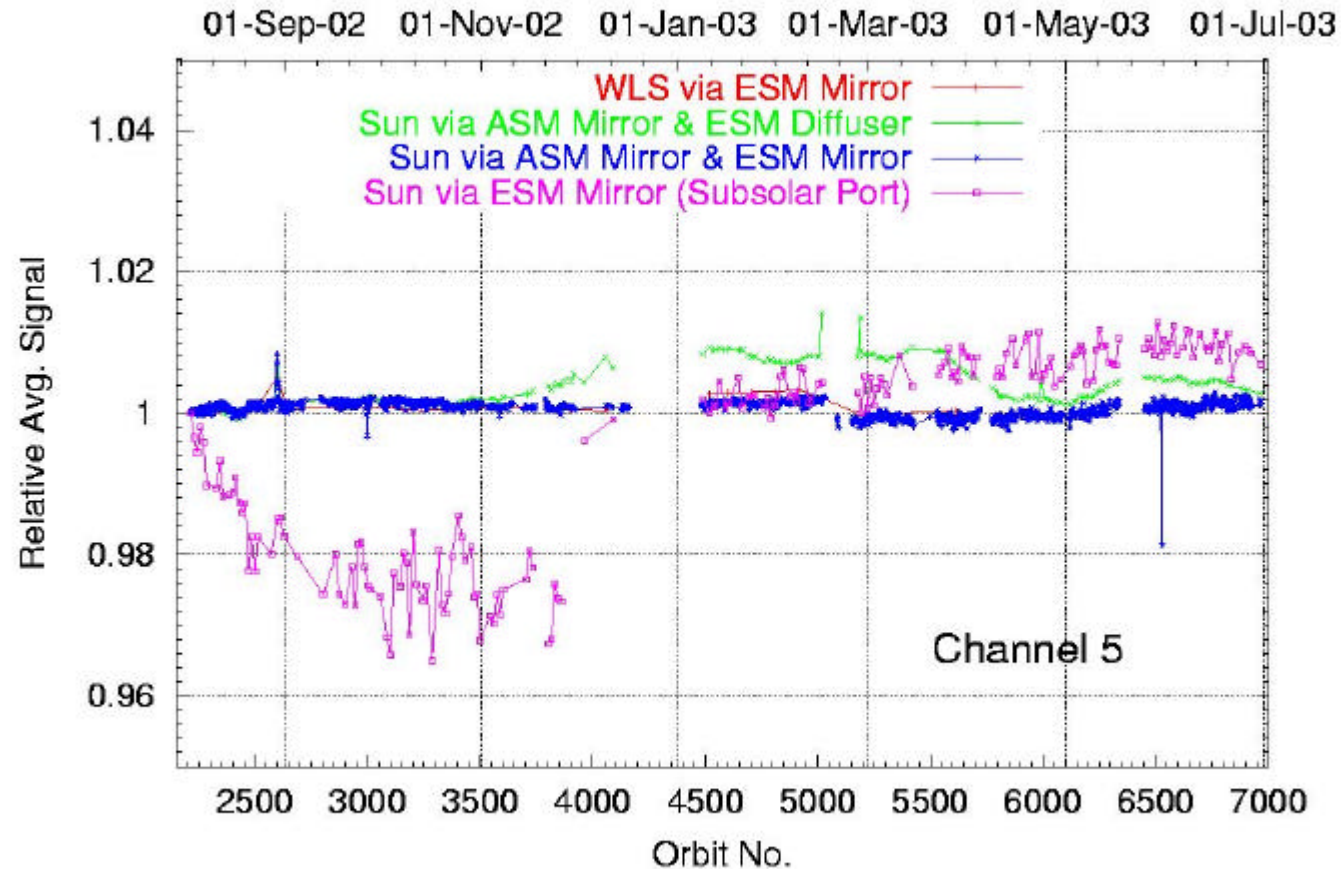
Light Path Monitoring Ch. 3



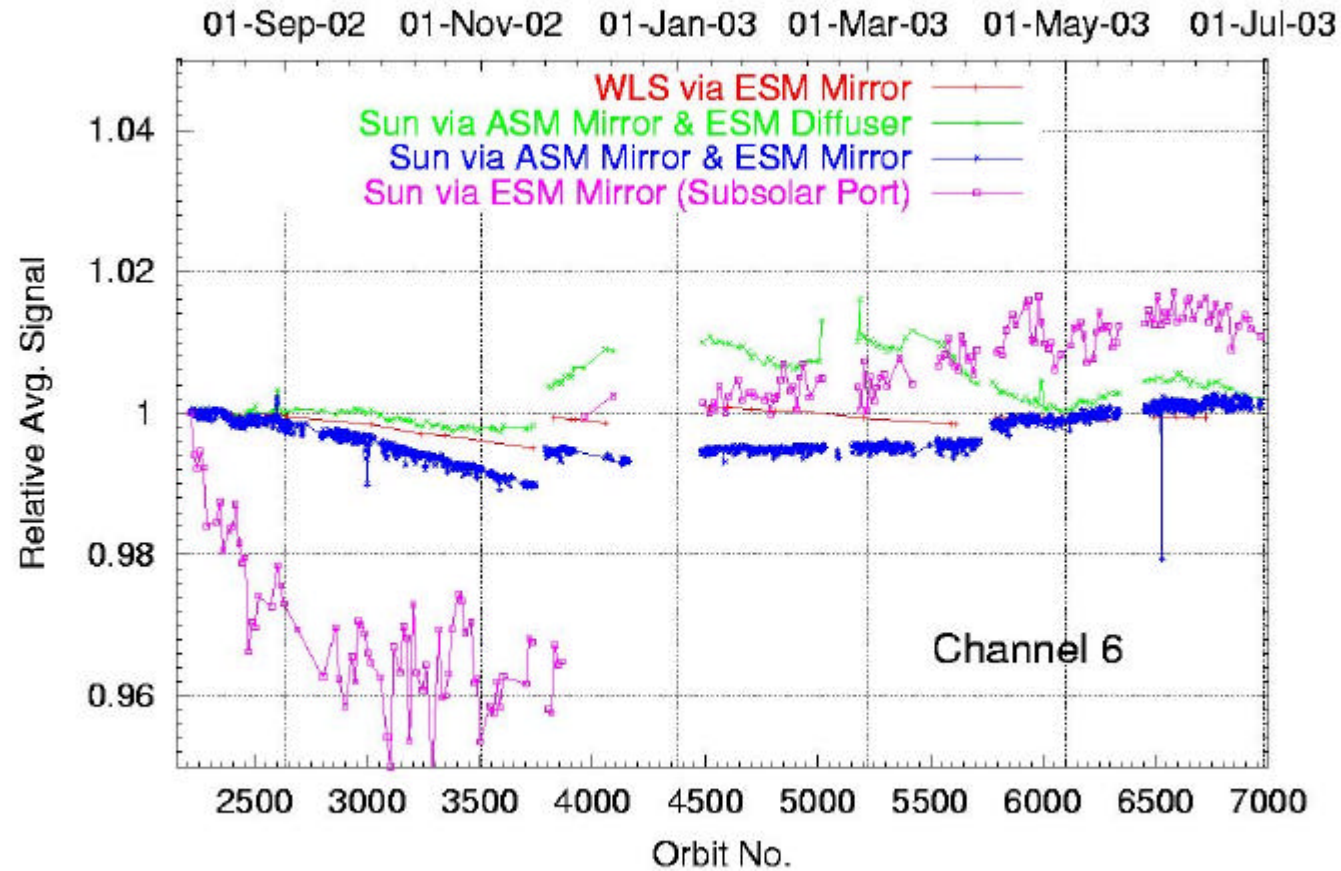
Light Path Monitoring Ch. 4



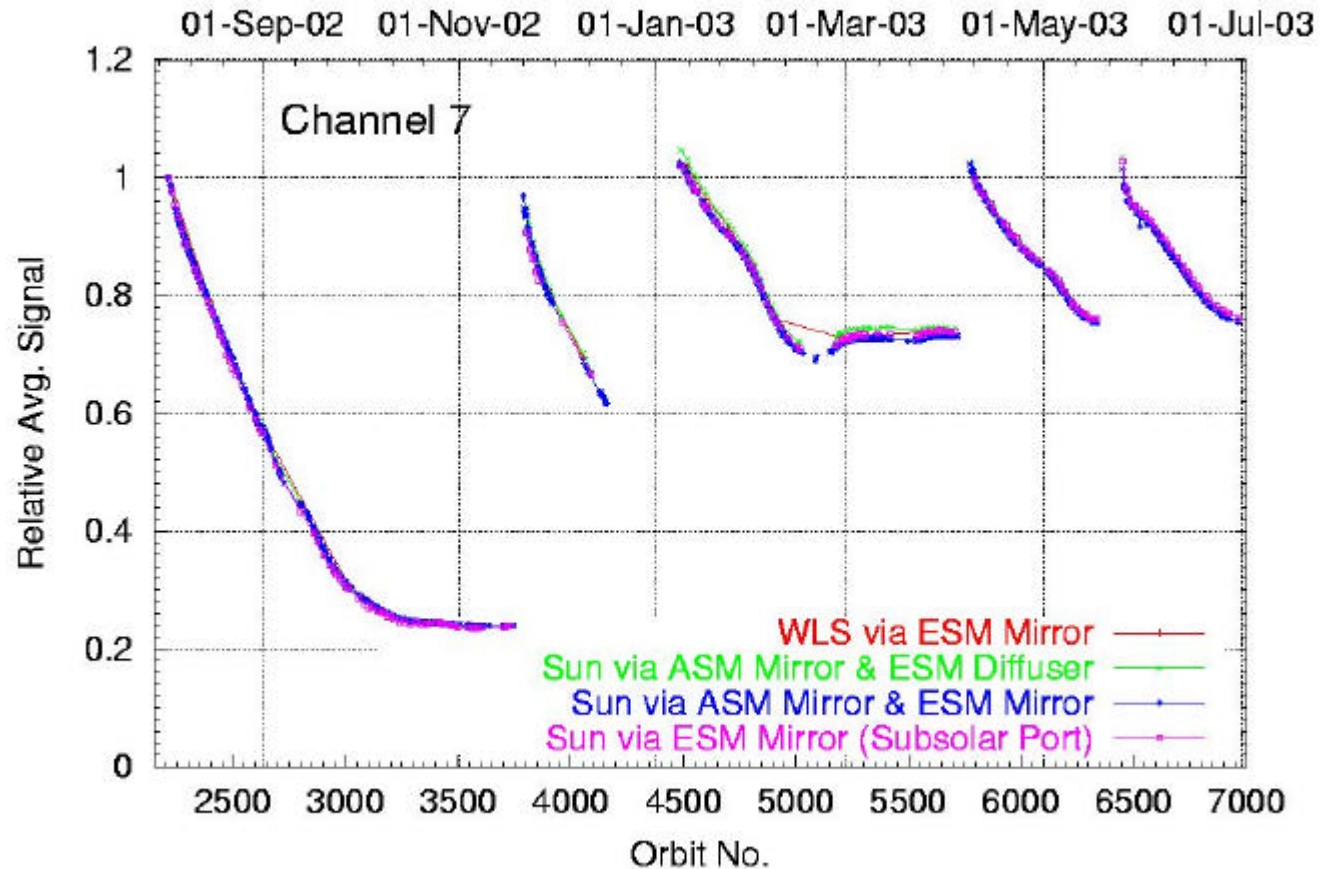
Light Path Monitoring Ch. 5



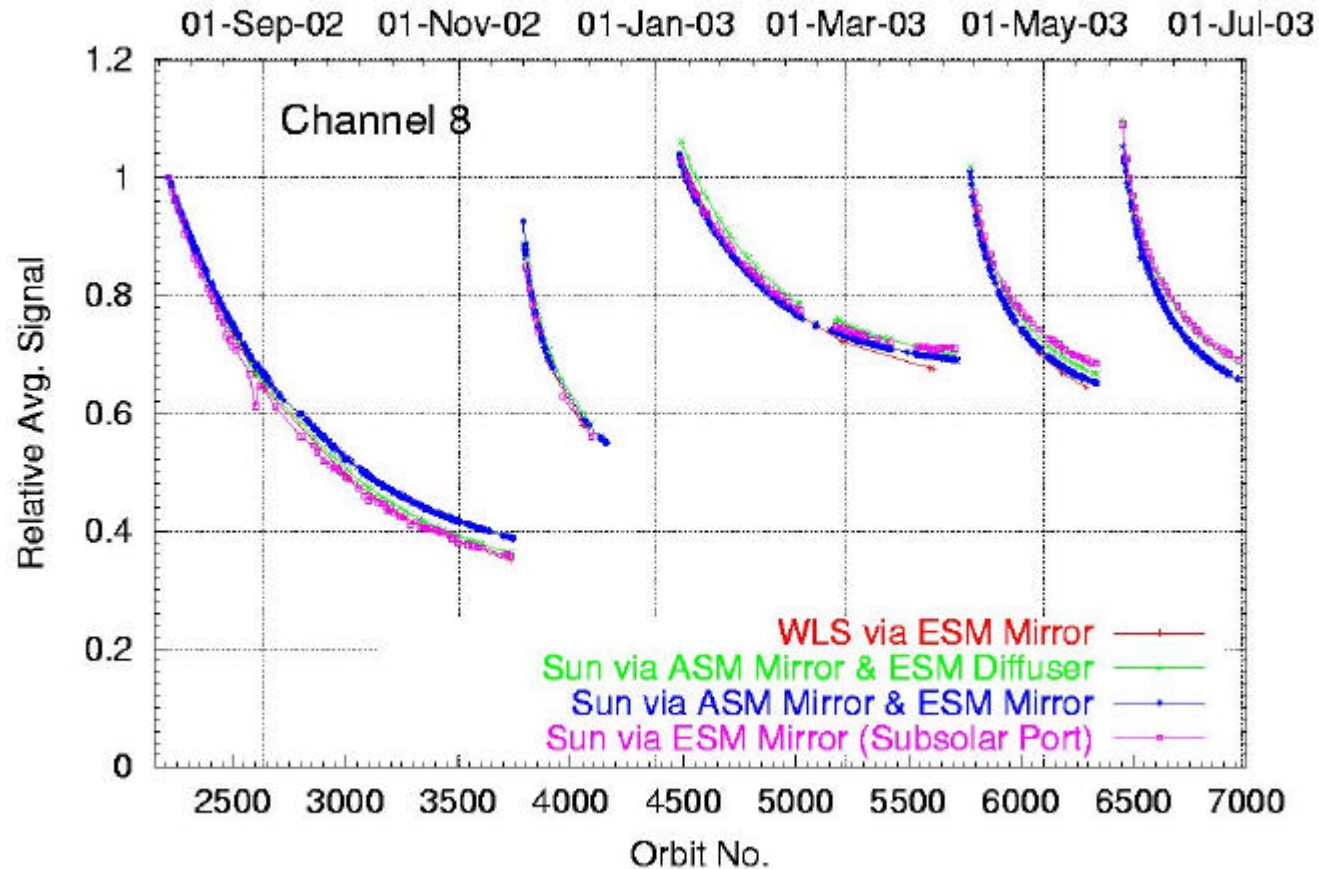
Light Path Monitoring Ch. 6



Light Path Monitoring Ch. 7



Light Path Monitoring Ch. 8



First Performance Monitoring Results

- Instrument seems to be radiometrically very stable
- Exception: Icing in channels 7 & 8:
 - Handled by regular decontaminations; frequency and duration currently under discussion
 - Throughput correction in 0-1b processing foreseen (part of Master Plan activities)
- Reason for small transmission decrease in channel 2 (but not channel 1!) still unknown (external straylight?)
- Science channel light path monitoring is operational; actual results on SOST and IFE web site.
- PMD monitoring has just started:
 - Limb/Occultation and WLS results look reasonable
 - No severe PMD degradation (at least $< 1\%$)
 - Monitoring problems with lunar and subsolar measurements
 - Update of monitoring concept may be required

Summary

- The SCIAMACHY instrument is generally in good shape
- Main problem: Throughput loss due to icing in IR channels
- Other open issues:
 - Tangent height anomaly
 - External straylight in limb
 - Possible light leak in channel 7