

# ANOMALIES (01.01.2006 - 31.12.2006)

On June 22 2003 the ERS-2 tape recorder became permanently unavailable due to a technical failure. The ERS-2 tape recorders were used to record the ERS-2 Low Rate mission globally. After eight years of continuous acquisition, this service is discontinued. The ERS-2 Low Rate mission is continued within the visibility of ESA ground stations over Europe, North Atlantic, the Arctic and western North America.

Additionally the DLR Antarctic Receiving Station at the O'Higgins base is providing GOME data in near-real time since 22 October 2003, allowing the monitoring of the ozone hole over the South Pole to resume; during year 2006 two new stations have been added Hobart (13 February 2006), and Singapore (18 October 2006);

Special GOME operations such as the operational switch off/switch-on in time tag (on calendar days 04, 14, 24 each month) are continued also after the unavailability of the tape recorders. Nevertheless due to the non completeness of data, analysis on cooler switchings and instrument switch-offs cannot be performed and detailed information is missing in the tables below.

After the high number of GOME Lamp Failures occurrences up to June 2004, the calibration lamp usage was reduced to Quarterly Calibration and special timelines (TST44) after an instrument switch-off with warm detectors.

Quarterly calibration is operated in the following way:

5 Calibration orbits are scheduled for 28 January, 28 April, 28 July, 28 October each calendar year started in October 2004.

The yearly report gives an overview on Lamp Failures as well as on nominal executed calibration lamp sequences.  $i_c^{1/2}i_c^{1/2}$

**listed are:**

- 1. single event upsets**
- 2. patches of the on-board software**
- 3. cooler switchings**
- 4. list of datagaps due to anomalies or special GOME instrument operations**
- 5. timeline interruption (operation in static nadir view)**
- 6. narrow swath timeline GMNNOT41**
- 7. commanding problems - incorrect timelines executions**
- 8. moon measurements**
- 9. lamp failures**
- 10. Calibration Lamp Sequences without Lamp Failure**
- 11. other events**

**single event upsets:**

Date	reason
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24/01/06	<p>GOME anomalous behaviour during orbits 56275-56278</p> <ul style="list-style-type: none"> <li>- 3xNack flag set</li> <li>- scan mirror position set to 261.8 deg continuously</li> <li>- scan mirror current values anomalous high (64340 BU)</li> <li>- thermal environment (besides detectors) increased by about 10K</li> </ul>
03/02/06	<p>GOME anomalous behavior during orbits 56417-56421 ~9:30 i<sub>c</sub>½ 15:32</p> <ul style="list-style-type: none"> <li>- 3xNack flag set</li> <li>- scan mirror position set to 261.8 deg continuously</li> <li>- scan mirror current values anomalous high (64664 BU)</li> <li>- thermal environment (besides detectors) increased by about 10K went back to nominal after the execution of a GOME power cycle at 15:32:24</li> </ul>
14/04/06	<p>GOME anomalous behavior during orbits 57425 - 57435</p> <ul style="list-style-type: none"> <li>- 3xNack flag set</li> <li>- scan mirror position set to 261.8 deg continuously</li> <li>- scan mirror current values anomalous high (65535 BU)</li> <li>- thermal environment (besides detectors) increased by about 10K</li> <li>- no NARROW SWATH measurements available</li> </ul>
03/05/06	<p>GOME anomalous behavior during orbits 57711</p> <ul style="list-style-type: none"> <li>- 3xNack flag set</li> <li>- scan mirror position set to 261.8 deg continuously</li> <li>- scan mirror current values high (64337 BU)</li> <li>- thermal environment (besides detectors) increased by about 10K went back to nominal afterwards in orbit 57711</li> </ul>
14/09/06	<p>GOME anomalous behavior during orbits 56417-56421 ~9:30 i<sub>c</sub>½ 15:32</p> <ul style="list-style-type: none"> <li>- 3xNack flag set continuously</li> <li>- scan mirror position set to 261.8 deg continuously</li> <li>- scan motor temp. increased by ca 40 deg K</li> <li>- scan mirror temp. increased by ca 10 deg K</li> <li>- scan unit temp. increased by ca 20 deg K</li> <li>- scan mirror current values high (64235 BU) instead ca. 38000</li> </ul> <p>this anomaly was cured with a time tag GMN11, switch off/on of GOME, data of day 15/09/2006, 00:49, orbit 59618 are nominal again</p>
04-06/11/06	<p>GOME anomalous behavior during orbits 60344 i<sub>c</sub>½ 60370, ~17:30 i<sub>c</sub>½ 13:21</p> <ul style="list-style-type: none"> <li>- No Co-adding Flags Set</li> <li>- Channel 2 Summation Intensity: Signal Reduced</li> <li>- Channel 4 Summation Intensity: Signal Reduced</li> </ul> <p>this anomaly was cured with a time tag GMN11, switch off/on of GOME, data of day 06/11/2006, 13:30, orbit 60371 are nominal again</p>
30/11/06	<p>GOME anomalous behavior during orbits 60711 i<sub>c</sub>½ 60713, ~10:20 i<sub>c</sub>½ 14:00</p> <ul style="list-style-type: none"> <li>- scan mirror position set to 261.8 deg</li> <li>- GOME 3xNack flag set</li> </ul> <p>this anomaly was cured with a time tag GMN11, switch off/on of GOME, at 13::24:12</p>

24-29/12/06	<p>GOME anomalous behavior during orbits 61057 <math>i_c</math> 1/2 61130, ~12:30 (24/12/06) <math>i_c</math> 1/2 14:53 (29/12/06)</p> <ul style="list-style-type: none"> <li>- 3xNack flag is set contiguously</li> <li>- scan mirror position is set to 261.8deg contiguously (no scanning)</li> <li>- increase of thermal environment related to scan mirror (scan mirror unit,scan motor,etc)</li> </ul> <p>this anomaly was cured with a time tag GMN11, switch off/on of GOME, data of day 29/12/2006, 14:53, orbit 61130 are nominal again</p>
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**patches of the on-board software:** none

**cooler switchings:**

Date	coolers off/on	maximum detector warm up temperature [Kelvin]
10/01/06	08:40 off 13:34 on	FPA 1: ca. 282 FPA 2: ca. 282 FPA 3: ca. 282 FPA 4: ca. 282
17/01/06	13:19 off ~19:30 on	FPA 1: 282.5 FPA 2: 282.5 FPA 3: 282.5 FPA 4: 282.5
25/01/06	09:10:24 off 10:54:44 on	FPA 1: 268 FPA 2: 268 FPA 3: 268 FPA 4: 268
03/02/06	07:48:03 off 11:11:13 on	FPA 1: 266.9 FPA 2: 267.4 FPA 3: 267.1 FPA 4: 267.6
22/02/06	07:51:11 off 12:52:37 on	FPA 1: 281.5 FPA 2: 281.5 FPA 3: 281.5 FPA 4: 281.5
11/06/06	03:28:42 off 08:59:06 on	FPA 1: 273.3 FPA 2: 273.3 FPA 3: 273.3 FPA 4: 273.3
17/07/06	08:35:57 off 10:07:30 on	FPA 1: 261.8 FPA 2: 261.8 FPA 3: 261.8 FPA 4: 261.8
22/08/06	08:02 off 14:38 on	FPA 1: 276.8 FPA 2: 276.8 FPA 3: 276.8 FPA 4: 276.8

30/11/06	01:14 off 10:44:03 on	FPA 1: 268.6 FPA 2: 269.5 FPA 3: 269.2 FPA 4: 269.6
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**list of datagaps due to anomalies or special GOME instrument operations:** (For detailed information see monthly performance)

Date	Orbit	duration (GOME off/start of nominal operations)	reason
10/01/06	56073 i <sub>c</sub> /2 56075	08:40 i <sub>c</sub> /2 11:59	GOME switch off (see unavailability ER2-UNA-2006/003)
17/01/06	56176 i <sub>c</sub> /2 56179	13:19 i <sub>c</sub> /2 18:15	GOME switch off (see unavailability ER2-UNA-2006/006)
25/01/06	56285 i <sub>c</sub> /2 56288	03:59:52 i <sub>c</sub> /2 09:10:24	GOME switch off (see ER2-UNA-2006/008)
03/02/06	56416 -56417	07:48:03 i <sub>c</sub> /2 09:30:48	GOME unavailable (see ER2-UNA-2006/009)
22/02/06	56688 i <sub>c</sub> /2 56690	07:51:11 i <sub>c</sub> /2 11:11:51	GOME switch off (see unavailability ER2-UNA-2006/010)
11/06/06	58246 i <sub>c</sub> /2 58250	03:28:42 i <sub>c</sub> /2 12:03:37	GOME switch off (see unavailability ER2-UNA-2006/018)
17/07/06	58762 i <sub>c</sub> /2 58763	04:30:10 i <sub>c</sub> /2 11:32:28	GOME un-powered (see ER-UNA-2006/023)
22/08/06	59279-59282	08:02:34 i <sub>c</sub> /2 12:51	GOME unavailability due to Payload in standby, due to wrong MCMD Time-tag (see ER-UNA-2006/028)
25/08/06	59320-59322	04:11:28 i <sub>c</sub> /2 09:58:03	no EGOI data due to IDHT Switch-down to standby MCMD execution is inhibited (ER2-UNA-2006/029)
30/11/06	60706 i <sub>c</sub> /2 60711	02:19:21 i <sub>c</sub> /2 08:59:48	data gap due to instrument switch-off (see unavailability report ER2-UNA2006/035)

**Timeline Interruption (operations in static nadir view):**

Date	Orbit No.	duration	reason
28/02/06	56780	17:50:18 i <sub>c</sub> /2 17:51:31	GOME in Nadir Static View (see ER2-UNA 2006/011) due to Emergency Switch down of AMI to Standby due to RBI Status Error
04/03/06	56835	13:52:35 i <sub>c</sub> /2 14:04:02	GOME in Nadir Static View
15/04/06	57433	09:52:00 - 10:18:10	GOME 1 Timeline stopped due to RA Emergency Switch-down (ER2-UNA-2006/015)

27/06/06	58478 i <sub>c</sub> /2 58482	09:17 i <sub>c</sub> /2 15:21	GOME Timeline stopped, instrument in Nadir Static View (see ER-UNA-2006/021)
17/07/06	58764	08:35 i <sub>c</sub> /2 10:07	GOME in Nadir Static View (see ER2-UNA 2006/023) due to GOME un-powered
08/12/06	60830	16:27:37 i <sub>c</sub> /2 18:01:59	GOME in Nadir Static View (see ER2-UNA 2006/036) due to PL synchronization

## Narrow Swath Timeline GMNNOT41

Date	Orbit No.	Duration
04-05/01/06	55990 i <sub>c</sub> /2 56003	14:00 (04/01/06) i <sub>c</sub> /2 11:00 (05/01/06)
14-15/01/06	56134 i <sub>c</sub> /2 56147	15:00 (14/01/06) i <sub>c</sub> /2 ~12:30 (15/01/06)
24-25/01/06	56279 i <sub>c</sub> /2 56289	18:00 (24/01/06) i <sub>c</sub> /2 ~11:00 (25/01/06)
04-05/02/06	56434 i <sub>c</sub> /2 56447	13:30 (04/02/06) i <sub>c</sub> /2 11:30 (05/02/06)
14-15/02/06	56576 i <sub>c</sub> /2 56591	12:00 (14/02/06) i <sub>c</sub> /2 13:00 (15/02/06)
24-25/02/06	56722 i <sub>c</sub> /2 56735	16:30 (24/02/06) i <sub>c</sub> /2 ~14:00 (25/02/06)
04-05/03/06	56839 i <sub>c</sub> /2 56849	20:46 (04/03/06) i <sub>c</sub> /2 ~13:30 (05/03/06) Loading Narrow Swath Timeline GMNNOT41 into Slot 1 failed onboard on 4 <sup>th</sup> March. GMNNOT41 was uplinked again correctly at 20:46:20. From 15:44:34 to 20:46:20 Gome was operating on the normal timeline GMNNOT42.
14-15/03/06	56980 i <sub>c</sub> /2 56993	~17:00 (14/03/06) i <sub>c</sub> /2 ~15:30 (15/03/06)
24-25/03/06	57122 i <sub>c</sub> /2 57137	~15:00 (24/03/06) i <sub>c</sub> /2 ~16:30 (25/03/06)
04-05/04/06	57282 i <sub>c</sub> /2 57295	~19:30 (04/04/06) i <sub>c</sub> /2 ~17:00 (05/04/06)
14/04/06		No narrow swath due to GOME anomaly
15/04/06	57435 i <sub>c</sub> /2 57439	12:00 (15/04/06) i <sub>c</sub> /2 ~18:00 (15/04/06) Narrow Swath Timeline GMNNOT41 data available after anomaly
24-25/04/06	57568 i <sub>c</sub> /2 57582	~19:00 (24/04/06) i <sub>c</sub> /2 ~16:20 (25/04/06)
04-09/05/06	57712 i <sub>c</sub> /2 57780	~20:30 (04/05/06) i <sub>c</sub> /2 14:22 (09/05/06) GMNNOT41, the Timeline remains activated after the nominal value due to an error occurred when the stop signal has been sent to the satellite. Manually reset has been performed
14-15/05/06	57854 i <sub>c</sub> /2 57869	~18:30 (14/05/06) i <sub>c</sub> /2 19:30 (15/05/06)
24-25/05/06	57997 i <sub>c</sub> /2 58011	~20:00 (24/05/06) i <sub>c</sub> /2 ~17:30 (25/05/06)
04-05/06/06	58156 i <sub>c</sub> /2 58169	~21:00 (04/06/06) i <sub>c</sub> /2 ~19:00 (05/06/06)
14-15/06/06	58298 i <sub>c</sub> /2 58311	~19:00 (14/06/06) i <sub>c</sub> /2 ~16:30 (15/06/06)
24-25/06/06	58442 i <sub>c</sub> /2 58455	~20:30 (24/06/06) i <sub>c</sub> /2 ~18:30 (25/06/06)
04-05/07/06	58584 i <sub>c</sub> /2 58599	~18:30 (04/07/06) i <sub>c</sub> /2 ~19:30 (05/07/06)
14-15/07/06	58728 i <sub>c</sub> /2 58741	~20:00 (14/07/06) i <sub>c</sub> /2 ~17:30 (15/07/06)
24-25/07/06	58872 i <sub>c</sub> /2 58885	~21:30 (24/07/06) - ~19:30 (25/07/06)
04-05/08/06	59028 i <sub>c</sub> /2 59040	~19:00 (04/08/06) - ~16:00 (05/08/06)
14-15/08/06	59172 i <sub>c</sub> /2 59185	~20:00 (14/08/06) - ~18:00 (15/08/06)
24-25/08/06	59314 i <sub>c</sub> /2 59329	~18:00 (24/08/06) - ~19:30 (25/08/06)
04-05/09/06	59472 i <sub>c</sub> /2 59486	~19:00 (04/09/06) - ~17:30 (05/09/06)

14-15/09/06	59618 i <sub>c</sub> ½ 59629	00:49 (15/09/06) - ~18:30 (15/09/06) no narrow swath executed on day 14/09 /2006 due to SEU Narrow Swath Timeline GMNNOT41 executed only 15/09/06 after GMN11 time tag
24-25/09/06	59758 i <sub>c</sub> ½ 59771	~19:00 (24/09/06) - ~16:30 (25/09/06)
04-05/10/06	59900 i <sub>c</sub> ½ 59913	~17:00 (04/10/06) - ~14:30 (05/10/06)
14-15/10/06	60042 i <sub>c</sub> ½ 60057	~15:00 (14/10/06) - ~16:00 (15/10/06)
24-25/10/06	60184 i <sub>c</sub> ½ 60197	~13:00 (24/10/06) - ~11:00 (25/10/06)
04-05/11/06	60342 i <sub>c</sub> ½ 60356	~14:00 (04/11/06) - ~13:30 (05/11/06)
14-15/11/06	60484 i <sub>c</sub> ½ 60499	~12:00 (14/11/06) - ~13:00 (15/11/06)
24-25/11/06	60628 i <sub>c</sub> ½ 60641	~14:00 (24/11/06) - ~11:00 (25/11/06)
04-05/12/06	60770 i <sub>c</sub> ½ 60786	~12:00 (04/12/06) - ~13:00 (05/12/06)
14-15/12/06	60914 i <sub>c</sub> ½ 60927	~13:00 (14/12/06) - ~11:30 (15/12/06)
24-25/12/06		No Narrow Swath Timeline GMNNOT41 available due to GOME anomaly

**Commanding Problems i<sub>c</sub>½ Incorrect Timelines Executions: none**

**Moon Measurements: none**

**Lamp Failures:**

Date	Lamp Failure / Orbit	remark
25/01/06	Lamp Failure (no. 171) Orbit 56289	Lamp Failure set, exact start cannot be given due to data availability only during ground station visibility -10:54:41, voltage reached only a value of 178 V
25/01/06	Lamp Failure (no. 172) Orbit 56289	Lamp Failure set, 10:52:59 i <sub>c</sub> ½ 10:54:41, voltage reached only a value of 178 V
28/01/06	Lamp Failure (no. 173 i <sub>c</sub> ½ 181) Orbit 56334 i <sub>c</sub> ½ 56339	Lamp Failures set during quarterly calibration sequences, voltage reached only a value of 180 V
22/02/06	Lamp Failure (no. 182) Orbit 56690	Lamp Failure set, start 12:50:55.446 i <sub>c</sub> ½ stop 12:52:35.958, (voltage dropped down to a value of about 178V after a few seconds i <sub>c</sub> ½ nominal value is ca. 198V)
28/04/06	Lamp Failure (no. 183 i <sub>c</sub> ½ 184) Orbit 57629 i <sub>c</sub> ½ 57630	Lamp Failures set during quarterly calibration sequences, (start time cannot be analyzed as not inside ground station visibility)
28/07/06	Lamp Failure (no. 185 i <sub>c</sub> ½ 188) Orbit 58929 i <sub>c</sub> ½ 58930	Lamp Failures set during quarterly calibration sequences, voltage reached only a value of about 179 V

29/07/06	Lamp Failures (no.189- 191) Orbits 58931 $\ddot{t}_c$ 58932	Lamp Failures set during quarterly calibration sequences, voltage reached only a value of about 180 V
22/08/06	Lamp Failure (no. 192) Orbit 59283	Lamp Failure flag set between 14:36:43 $\ddot{t}_c$ 14:38:28. Lamp sequence started at 14:36:28 but voltage reached only a value of ~180 V instead of nominally ~200 V
28/10/06	Lamp Failure (no. 193 $\ddot{t}_c$ 198) Orbit 60242 $\ddot{t}_c$ 60244	Lamp Failures set during quarterly calibration sequences, voltage reached only a value of about 179 V

### Calibration Lamp Sequences without Lamp Failure:

Date	Orbit	remark
10/01/06	56075	13:36:33 $\ddot{t}_c$ 13:38:28 Calibration lamp sequence without lamp failure, without lamp instability
10/01/06	56075	13:46:15 $\ddot{t}_c$ 13:46:49 (exact stop time cannot be given) Calibration lamp sequence without lamp failure, but calibration lamp instability, voltage decreased suddenly from a value of about ~200 V to a value of 174 V at 13:46:36
17/01/06	56179	18:17:50 $\ddot{t}_c$ 18:19:47 Calibration lamp sequence without lamp failure, without lamp instability
03/02/06	56418	Start time (cannot be given, no visibility) $\ddot{t}_c$ stop 11:01:34 Calibration lamp sequence without lamp failure, without lamp instability
03/02/06	56418	11:09:14 $\ddot{t}_c$ 11:11:13 Calibration lamp sequence without lamp failure, without lamp instability
28/04/06	57626	20:21:54 $\ddot{t}_c$ 20:39:26 Calibration lamp sequence without lamp failure but calibration lamp instability, voltage dropped down suddenly at 20:22:18 to 180 V instead of nominal staying at 198 V
28/04/06	57626	21:07:05 $\ddot{t}_c$ 21:14:51 Calibration lamp sequence without lamp failure and without lamp instability
28/04/06	57627	21:48:08 $\ddot{t}_c$ 21:50:16 Calibration lamp sequence without lamp failure and without lamp instability
28/04/06	57627	22:02:31 $\ddot{t}_c$ 22:07:35 Calibration lamp sequence without lamp failure but calibration lamp instability, voltage dropped down suddenly at 22:02:52 to 180 V instead of nominal staying at 198 V)
28/04/06	57627	22:46:58 $\ddot{t}_c$ 22:55:25 Calibration lamp sequence without lamp failure and without lamp instability





05/09/06 - 31/10/06	59849 - 60278	GOME South Polar View GMNSPT31
18/10/06		Activation of the ground station Singapore (SG)