Planck-LFI and SCS Bi-Monthly Report: February, March 2010

TITLE:

DOC. TYPE: **Test Report**

PROJECT REF.: **PL-LFI-PST-RP-091** **PAGE: I of IV, 14**

ISSUE/REV.: **1.0** **DATE:** April 10th 2010

Prepared by	**A. GREGORIO** **LFI Instrument Operation Manager** **G. MORGANTE** **SCS Operation Manager**	**Date:** April 10th, 2010 **Signature:**
Agreed by	**C. BUTLER** **LFI Program Manager**	**Date:** April 10th, 2010 **Signature:**
Approved by	**N. MANDOLESI** **LFI Principal Investigator**	**Date:** April 10th, 2010 **Signature:**

DISTRIBUTION LIST

Recipient	Company / Institute	E-mail address	Sent
M. BERSANELLI	UNIMI – Milano	marco.bersanelli@mi.infn.it	Yes
R.C. BUTLER	INAF/IASF – Bologna	butler@iasfbo.inaf.it	Yes
F. CUTTAIA	INAF/IASF – Bologna	cuttaia@iasfbo.inaf.it	Yes
A. GREGORIO	UniTs – Trieste	anna.gregorio@ts.infn.it	Yes
N. MANDOLESI	INAF/IASF – Bologna	mandolesi@iasfbo.inaf.it	Yes
M. MARIS	INAF/OATs – Trieste	maris@oats.inaf.it	Yes
A. MENNELLA	UNIMI – Milano	aniello.mennella@fisica.unimi.it	Yes
G. MORGANTE	INAF/IASF – Bologna	morgante@iasfbo.inaf.it	Yes
D. PEARSON	JPL/NASA	david.p.pearson@jpl.nasa.gov	Yes
D. TAVAGNACCO	UniTs – Trieste	tavagnacco@oats.inaf.it	Yes
L. TERENZI	INAF/IASF – Bologna	terenzi@iasfbo.inaf.it	Yes
A. ZACCHEI	INAF/OATs – Trieste	zacchei@oats.inaf.it	Yes
LFI OPERATION	LFI	lfi-operations@oats.inaf.it	Yes
HFI OPERATION	HFI	hfi-operations@ias.u-psud.fr	Yes
ESA PSO	ESA/PSO	pso_operations@sciops.esa.int	Yes
J. TAUBER	ESA/PSO	tauber@rssd.esa.int	Yes
D. TEXIER	ESA/PSO	damien.texier@sciops.esa.int	
M. CASALE	ESA/PSO	Mauro.Casale@esa.int	Yes
L. MENDES	ESA/PSO	lmendes@sciops.esa.int	Yes
ESA MOC	ESA/MOC	esoc_hp_fct@esa.int	Yes
C. WATSON	ESA/MOC	Christopher.J.Watson@esa.int	Yes
S. FOLEY	ESA/MOC	Steve.Foley@esa.int	Yes
M. BAKER	ESA/MOC	michelle.baker@esa.int	Yes
F. DREGER	ESA/MOC	Frank.Dreger@esa.int	Yes
A. MCDONALD	ESA/MOC	Alastair.McDonald@esa.int	Yes
M. MUECK	ESA/MOC	Matthias.Mueck@esa.int	Yes
V. COMPANYS	ESA/MOC	Vicente.Companys@esa.int	Yes
B. GANDOLFO	ESA/MOC	Bruno.Gandolfo@esa.int	Yes

CHANGE RECORD

Issue	Date	Sheet	Description of Change	Release
1.0	April, 10th 2010	All	First release	

TABLE OF CONTENTS

1 ACRONYMS

AIV	Assembly, Integration, Verification
AR	Anomaly Report
ASW	Application Software
BEM	Back End Module
BEU	Back End Unit
CCS	Central Check-out System
CDMU	Central Data Management Unit
CoP	Commissioning Phase
CPV	Calibration and Performance Verification
CSL	Centre Spatiale de Liège
DAE	Data Acquisition Electronics
DPU	Digital Processing Unit
EGSE	Electrical ground Support Equipment
FEM	Front End Module
I-EGSE	Instrument EGSE
ILT	Instrument Level Tests
IST	Integrated Satellite Test
OBC	On Board Clock
RAA	Radiometer Array Assembly
REBA	Radiometric Electronic Box Assembly
S/C	Spacecraft
SCOE	Spacecraft Control and Operation System
SPU	Signal Processing Unit
SUSW	Start- Up Software
SVM	Service Module
TBC	To Be Checked
TBW	To Be Written
TC	TeleCommand
TM	Telemetry
UFT	Unit Functional Test

2 APPLICABLE AND REFERENCE DOCUMENTS

2.1 Applicable Documents

[AD1] Herschel/Planck Instrument Interface document Part A, SCI-PT-IIDA-04624 Issue 3.3

[AD2] Herschel/Planck Instrument Interface document Part B, SCI-PT-IIDB-04142 Issue 3.1

[AD3] Herschel/Planck Instrument Interface document Part B, SCI-PT-IIDB-04142 Issue 3.1, Annex 3, ICD 750800115

[AD4] Herschel/Planck Instrument Interface document Part A, SCI-PT-IIDA-04624 Issue 3.3 Annex 10

[AD5] Planck-LFI In-Orbit Calibration and Verification Phase Report: Executive Summary, PL-LFI-PST-RP-086 1.1

2.2 Reference Documents

[RD1] Planck Instrument Testing at PFM S/C levels, H-P-3-ASP-TN-0676, Issue 1.0

[RD2] Planck LFI User Manual, PL-LFI-PST-MA-001 Issue 4.0

[RD3] Planck LFI Operation Plan, PST-PL-011 Issue 3.0

[RD4] Planck-LFI and SCS Monthly Report: November 2009, PL-LFI-PST-RP-087

[RD5] Planck-LFI and SCS Monthly Report: December 2009, January 2010, PL-LFI-PST-RP-088

2.3 Annex Documents

3 INTRODUCTION

3.1 Purpose and Scope

This document summarises the activities performed by the LFI Instrument Operation Team in February and March 2010.

3.2 Team

LFI Personnel involved on a daily basis is:

LFI Instrument Operation Manager	Anna Gregorio UniTs anna.gregorio@ts.infn.it
SCS Operation Manager	Gianluca Morgante morgante@iasfbo.inaf.it
LFI Calibration Scientist	Aniello Mennella UniMi aniello.mennella@fisica.unimi.it
LFI IOT	Francesco Cuttaia, Anna Gregorio, Michele Maris, Aniello Mennella, Gianluca Morgante, Dave Pearson, Daniele Tavagnacco, Luca Terenzi

4 LFI Activities

4.1 Daily Operations

OD considered: 264 to 322 corresponding to DoY 32 to 90 of year 2010.

On a daily basis the LFI IOT performed the following analysis (see the LFI wiki http://belzebu.lambrate.inaf.it/twiki/bin/view/LFI/DailyOperations):

1. check science real time data during the DTCP: OK;
2. check the DQR and WHR (see § 4.3): OK;
3. check all the data per OD (first by looking at a Compressed Data Set produced by averaging daily data over 1 min and then if necessary on the full data set): OK;
4. check the TM rate by looking at the "Telemetry Bulletin" (http://belzebu.lambrate.inaf.it/twiki/bin/view/LFI/DaillyTelemetryBullettin, http://belzebu.lambrate.inaf.it/twiki/bin/view/LFI/TMBudgetAnalysis, ftp://FLTOPS_user@192.167.166.51:2121/Telemetry_DM/db): OK;
5. check of peculiar behaviour of the instrument (DAE gain change, change in Output Voltage, …):
    a. In Table 1 below the updated list of DAE gain change up to March the 31st;
    b. A few small jumps in the drain current behaviour are occasionally observed. All these events are tracked but have no impact on the science pipeline;
6. check any LFI production of event report TM(5,x) or TC rejection/failure TM(1,2) / TM(1,8):
    a. Several TM(5,1) – alarm reports were produced in these two months, all related to an EDAC intervention. See § 5.3 for the complete list of these events, no TM(5,2) or TM(5,4);
    b. No OOL were produced by the LFI;
    c. No TM(1,2) or TM(1,8) were produced by the LFI.

Event #	OD	Channel	TIme start	Time end	Gain before change			Gain after change			Saturated	Flagged
					DEC	BIN	Physical	DEC	BIN	Physical		
1	89-91	LFI24S-11	2009-08-11T04:25:06Z	2009-08-13T13:50:53Z	10	1010	4	-1	1111111111	UNKNOWN	YES	YES
2	107-110	LFI21S-10	2009-08-28T16:36:28Z	2009-08-31T15:39:09Z	9	1001	6	15	1111	48	NO	YES
3	114-116	LFI23M-00	2009-09-04T17:15:05Z	2009-09-07T12:45:02Z	9	1001	6	11	1011	24	NO	YES
4	116	LFI25M-00	2009-09-07T04:51:20Z	2009-09-07T12:45:02Z	3	11	8	2	10	4	NO	YES
5	124	LFI20M-00	2009-09-15T10:30:07Z	2009-09-15T13:27:10Z	9	1001	6	11	1011	24	YES (sky)	YES
6	126-127	LFI28S-11	2009-09-17T03:33:05Z	2009-09-18T11:16:45Z	9	1001	6	11	1011	24	YES (sky)	YES
7	128	LFI23S-11	2009-09-18T17:14:20Z	2009-09-19T11:19:34Z	9	1001	6	-1	1111111111	UNKNOWN	YES	YES
8	132	LFI22S-11	2009-09-23T08:23:38Z	2009-09-23T08:53:17Z	9	1001	6	8	1000	3	NO	YES
9	140	LFI23M-01	2009-10-01T07:31:38Z	2009-10-01T08:08:22Z	9	1001	6	11	1011	24	NO	YES
10	144	LFI18S-11	2009-10-05T09:59:02Z	2009-10-05T10:17:12Z	9	1001	6	-1	1111111111	UNKNOWN	YES	YES
11	150	LFI23M-00	2009-10-11T02:34:42Z	2009-10-11T03:09:02Z	9	1001	6	11	1011	24	NO	YES
12	154	LFI18S-10	2009-10-14T18:08:46Z	2009-10-14T18:39:20Z	9	1001	6	8	1000	3	NO	YES
13	157	LFI20S-10	2009-10-18T04:18:55Z	2009-10-18T04:33:40Z	9	1001	6	-1	1111111111	UNKNOWN	YES	YES
14	165	LFI25S-10	2009-10-26T10:33:36Z	2009-10-26T11:05:36Z	3	11	8	1	1	2	NO	YES
15	171	LFI21M-00	2009-10-31T17:06:57Z	2009-10-31T17:22:45Z	9	1001	6	8	1000	3	NO	YES

16	177	LFI21M-01	2009-11-07T07:49:20Z	2009-11-07T08:14:56Z	9	1001	6	-1	1111111111	UNKNOWN	YES	YES
17	187	LFI22M-00	2009-11-16T15:57:53Z	2009-11-16T16:11:57Z	9	1001	6	-1	1111111111	UNKNOWN	YES	YES
18	239	LFI28M-01	2010-01-08T06:35:27Z	2010-01-08T06:43:25Z	9	1001	6	-1	1111111111	UNKNOWN	YES	YES
19	244	LFI26S-10	2010-01-12T15:31:09Z	2010-01-12T16:04:01Z	10	1010	12	-1	1111111111	UNKNOWN	YES	YES
20	244	LFI19S-10	2010-01-12T17:07:11Z	2010-01-12T17:46:52Z	9	1001	6	8	1000	3	NO	YES
21	248	LFI25S-11	2010-01-17T04:52:50Z	2010-01-17T05:33:55Z	3	11	8	-1	1111111111	UNKNOWN	YES	YES
22	280	LFI19M-00	2010-02-18T10:47:15Z	2010-02-18T11:21:12Z	9	1001	6	-1	1111111111	UNKNOWN	YES	YES
23	281	LFI23M-01	2010-02-19T05:50:46Z	2010-02-19T06:22:14Z	9	1001	6	-1	1111111111	UNKNOWN	YES (sky)	YES
24	307	LFI22M-11	2010-03-16T14:14:53Z	2010-03-16T14:22:28Z	9	1001	6	-1	1111111111	UNKNOWN	YES (sky)	YES
25	307	LFI22M-00	2010-03-17T10:51:34Z	2010-03-17T11:09:37Z	9	1001	6	-1	1111111111	UNKNOWN	YES (sky)	YES
26	320	LFI23S-11	2010-03-30T06:29:14Z	2010-03-30T07:08:39Z	9	1001	6	8	1000	3	NO	YES

Table 1 DAE Gain change events

4.1.1 Instrument Commanding Requests

No Commanding Request was posted in February and March 2010.

4.2 SCS Operations

In the period from OD264 to OD322 (Feb 1st - March 31st 2010, DoY 32 - 90) SCS behaviour has been nominal, no on-board event or alarm has been generated. Two OOLs have been generated on ground system (see par. 5.4 and 5.5).
Cooler operations have been based on the planned weekly adjustments: heat-up powers have been levelled and then (since Feb 11th, OD274) adjusted according to cycle-time reductions; desorption power has been increased at a rate of 1.5W per week by alternating 1W and 2W steps.

Date of Upload	Actual Time of Upload	Parameters Change	TPF File
04.02.2010	035.22.11.33	Heatup powers increased as follows: Bed 1 from 115 to 116W (+1) Bed 2 from 115 to 117W (+2) Bed 3 from 115 to 116W (+1) Bed 4 from 113 to 116W (+3) Bed 5 from 113 to 116W (+3) Bed 6 from 113 to 116W (+3) Desorption powers changed as follows: Bed 1 from 177 to 177W (+0) Bed 2 from 176 to 176W (+0) Bed 3 from 176 to 176W (+0) Bed 4 from 171 to 173W (+2) Bed 5 from 174 to 175W (+1) Bed 6 from 174 to 175W (+1) Cycletime is decreased by 5s (from 860s to 855s)	PFSCLPM_LUT_PWRT_N_0030.ipf
11.02.2010	042.22.43.55	Heatup powers increased by 1W: Bed 1 from 116 to 117W (+1) Bed 2 from 117 to 118W (+1) Bed 3 from 116 to 117W (+1) Bed 4 from 116 to 117W (+1) Bed 5 from 116 to 117W (+1) Bed 6 from 116 to 117W (+1)	PFSCLPM_LUT_PWRT_N_0031.ipf

		Desorption powers increased by 1W: Bed 1 from 177 to 178W (+1) Bed 2 from 176 to 177W (+1) Bed 3 from 176 to 177W (+1) Bed 4 from 173 to 174W (+1) Bed 5 from 175 to 176W (+1) Bed 6 from 175 to 176W (+1) Cycletime is decreased by 5s (from 855s to 850s)	
18.02.2010	049.21.28.51	Heatup powers increased by 1W: Bed 1 from 117 to 118W (+1) Bed 2 from 118 to 119W (+1) Bed 3 from 117 to 118W (+1) Bed 4 from 117 to 118W (+1) Bed 5 from 117 to 118W (+1) Bed 6 from 117 to 118W (+1) Desorption powers increased by 2W: Bed 1 from 178 to 180W (+2) Bed 2 from 177 to 179W (+2) Bed 3 from 177 to 179W (+2) Bed 4 from 174 to 176W (+2) Bed 5 from 176 to 178W (+2) Bed 6 from 176 to 178W (+2) Cycletime is decreased by 5s (from 850s to 845s) Bed temperature limit for transition from Normal into Startup (NORMAL_ENTER_STARTUP_MNCET) raised from 500K to 515K	PFSCLPM_LUT_PWRT_N_0032.ipf PFSCLPM_LUT_MODE_N_0003.ipf
25.02.2011	057.00.15.39	Cycletime is decreased by 10s (from 845s to 835s) in order to avoid spin period (60s) harmonics. For this reason, heatup powers increased by 2W: Bed 1 from 118 to 120W (+2) Bed 2 from 119 to 121W (+2) Bed 3 from 118 to 120W (+2) Bed 4 from 118 to 120W (+2) Bed 5 from 118 to 120W (+2) Bed 6 from 118 to 120W (+2) Desorption powers increased by 1W: Bed 1 from 180 to 181W (+1) Bed 2 from 179 to 180W (+1) Bed 3 from 179 to 180W (+1) Bed 4 from 176 to 177W (+1) Bed 5 from 178 to 179W (+1) Bed 6 from 178 to 179W (+1) LPSB power increased by 0.02W, from 1.21W to 1.23W	PFSCLPM_LUT_PWRT_N_0033.ipf
04.03.2010	064.00.08.53	Heatup powers increased by 2W: Bed 1 from 120 to 122W (+2) Bed 2 from 121 to 123W (+2) Bed 3 from 120 to 122W (+2) Bed 4 from 120 to 122W (+2) Bed 5 from 120 to 122W (+2) Bed 6 from 120 to 122W (+2) Desorption powers increased by 2W: Bed 1 from 181 to 183W (+2) Bed 2 from 180 to 182W (+2) Bed 3 from 180 to 182W (+2) Bed 4 from 177 to 179W (+2)	PFSCLPM_LUT_PWRT_N_0034.ipf

		Bed 5 from 179 to 181W (+2) Bed 6 from 179 to 181W (+2) Cycletime is decreased by 10s (from 835s to 825s) LPSB power increased by 0.02W, from 1.23W to 1.25W	
11.03.2010	071.00.05.00	Heatup powers increased by 1W: Bed 1 from 122 to 123W (+1) Bed 2 from 123 to 124W (+1) Bed 3 from 122 to 123W (+1) Bed 4 from 122 to 123W (+1) Bed 5 from 122 to 123W (+1) Bed 6 from 122 to 123W (+1) Desorption powers increased by 1W: Bed 1 from 183 to 184W (+1) Bed 2 from 182 to 183W (+1) Bed 3 from 182 to 183W (+1) Bed 4 from 179 to 180W (+1) Bed 5 from 181 to 182W (+1) Bed 6 from 181 to 182W (+1) LPSB power +0.02W (from 1.25 to 1.27W) Cycletime decreased by 10s (from 825 to 815s)	PFSCLPM_LUT_PWRT_N_0035.ipf
18.03.2010		Heatup powers remain constant: Bed 1 at 123W Bed 2 at 124W Bed 3 at 123W Bed 4 at 123W Bed 5 at 123W Bed 6 at 123W Desorption powers increased by 2W: Bed 1 from 184 to 186W (+2) Bed 2 from 183 to 185W (+2) Bed 3 from 183 to 185W (+2) Bed 4 from 180 to 182W (+2) Bed 5 from 182 to 184W (+2) Bed 6 from 182 to 184W (+2) Cycletime stays constant at 815s LPSB power increased by 0.02W, from 1.27W to 1.29W	PFSCLPM_LUT_PWRT_N_0036.ipf
25.03.2010	085.00.37.01	Heatup powers increased by 1W: Bed 1 from 123 to 124W (+1) Bed 2 from 124 to 125W (+1) Bed 3 from 123 to 124W (+1) Bed 4 from 123 to 124W (+1) Bed 5 from 123 to 124W (+1) Bed 6 from 123 to 124W (+1) Desorption powers increased by 2W: Bed 1 from 186 to 188W (+2) Bed 2 from 185 to 187W (+2) Bed 3 from 185 to 187W (+2) Bed 4 from 182 to 184W (+2) Bed 5 from 184 to 186W (+2) Bed 6 from 184 to 186W (+2) Cycletime decreased by 5s (from 815 to 810s)	PFSCLPM_LUT_PWRT_N_0037.ipf

Table 2 SCS weekly adjustments in February 2010 -March 2010

SCS OT daily analysis has included the following steps:

1. check all cooler data per OD with particular attention to main operational parameters

- High Pressure
- Cold End temperatures and their stability
- LPSB pressure and temperature
- Beds temperature and pressure
- Warm Radiator interfaces
- VG3 Interfaces

2. check the DQR and WHR (see § 4.3), that are part of the LFI reports

4.3 Daily and Weekly Reports

DQR production normal:

OD	Reception Date	Time	Notes
202	3/12/2009	13.23	
203	4/12/2009	15.02	
204	5/12/2009	16.07	
205	7/12/2009	14.3	
206	9/12/2009	12.44	
207	9/12/2009	12.44	
208	9/12/2009	12.44	
209	10/12/2009	14.41	
210	11/12/2009	15.36	
211	12/12/2009	18.2	
212	14/12/2009	15.04	
213	15/12/2009	17.22	
214	15/12/2009	17.22	
215	16/12/2009	13.05	
216	17/12/2009	15.1	
217	18/12/2009	15.32	
218	19/12/2009	13.41	
219	21/12/2009	14.15	
220	21/12/2009	14.15	
221	23/12/2009	14.16	
222	23/12/2009	15.57	
223	24/12/2009	15.57	
224	26/12/2009	16.41	
225	26/12/2009	16.41	
226	28/12/2009	10.58	
227	28/12/2009	10.59	
228	29/12/2009	12.37	
229	30/12/2009	20.45	
230	31/12/2009	13.53	
231	1/1/2010	12.53	
232	2/1/2010	11.57	
233	4/1/2010	12.28	
234	5/1/2010	16.47	

235	5/1/2010	16.48	
236	6/1/2010	18.14	
237	7/1/2010	16.46	
238	8/1/2010	15.27	
239	9/1/2010	15.53	
240	11/1/2010	13.32	
241	11/1/2010	13.33	
242	15/01/2010	15.02	
243	14/01/2010	15.01	
244	14/01/2010	15.01	
245	15/01/2010	15.02	
246	16/01/2010	15.59	
247	18/01/2010	16.22	
248	18/01/2010	16.22	
249	19/01/2010	17.02	
250	20/01/2010	16.05	
251	22/01/2010	9.33	
252	22/01/2010	14.47	
253	23/01/2010	16.1	
254	25/01/2010	13.52	
255	25/01/2010	13.52	
256	26/01/2010	15.1	
257	27/01/2010	13.35	
258	28/01/2010	14.36	
259	29/01/2010	11.37	
260	30/01/2010	17.13	
261	1/2/2010	10.07	
262	1/2/2010	16.45	

Table 3 LFI DQR production

WHR production normal:

WHR	Production Date	Time	Note
WHRL_LFISDA_D_04022010_0025_00001.PLAN	4/2/2010	0:57	
WHRL_LFISDA_D_11022010_0026_00001.PLAN	11/2/2010	6:00	
WHRL_LFISDA_D_21022010_0027_00001.PLAN	21/02/2010	2:52	
WHRL_LFISDA_D_26022010_0028_00001.PLAN	26/02/2010	2:52	
WHRL_LFISDA_D_04032010_0029_00001.PLAN	40271	1:40	
WHRL_LFISDA_D_11032010_0030_00001.PLAN	11/3/2010	1:40	
WHRL_LFISDA_D_18032010_0031_00001.PLAN	18/03/2010	3:21	
WHRL_LFISDA_D_25032010_0032_00001.PLAN	25/03/2010	3:07	

Table 4 LFI WHR production

5 Anomaly Status

No new anomaly was raised since December 2009.
Here a short report on all of the open ARs that require an Action on the LFI.

5.1 P_SC-30: LFI SPU Desynchronisation Anomaly

During the pass on DOY200 as part of the REBA Tuning Verification activity, a series of TM(5,1) reports were generated and the VC1 Real-Time Science could not be re-established after the setting of the new REBA parameters. A recovery procedure was applied and the REBA parameters could be successfully updated.
During the REBA Tuning Verification Check on DOY210 there was a repeat of the SPU anomaly. The same recovery procedure as last time was exercised and the nominal configuration was recovered.

Action 38 requires an LFI User Manual update wrt TM(5,1) reports. A deadline for a possible UM updated should be defined.

5.2 P_SC-43: LFI RCA Channels see anomalous Gain increase

During OD 91, the output signal of RCA24 11 was stuck at a fixed value with RMS equal to 0. This was indicating that the output signal was outside the DAE range (saturation). The way it changed indicates a variation in the DAE gain of the channel. Restoring the default value saved in the DAE solves the problem.

The current number of occurrences of unexpected Gain change in the LFI RCA channels is 21, see Tab. 1 above. The changes in the Gain values have shown both increases and decreases.

Action 55 “Do a more detailed analysis for possible offset changes” is still open. The two components are different from the hardware point of view and thus the gain sensitivity to radiation effects does not imply a similar problem on the offset circuit. Anyway we will analyse in detail also this kind of events but this analysis is not yet ready.

5.3 P_SC-21: EDAC Intervention

Since LFI switch on (June 4th) many event reports SID 5002 have been generated all indicating that EDAC single errors have been encountered. The average rate is about 1 every 3 days. The corresponding memory areas are spread on DPU and SPU and both on Data and Program RAM (DM/PM). By now these memory areas were outside the used region of memories.

These types of events are indeed foreseen and indicate that the EDAC is working as expected.
Only events type (5,1) arose up to now, no double errors, that would cause an error report TM(5,4), meaning that there is no memory damage. In the table below the list of these events.

Note that this AR is used only to track EDAC single error events on LFI.

# event	Date (OBT)	DPU/SPU	DM/PM
1	05/06/2009 16.43.43	DPU	DM
2	13/06/2009 16.43.51	DPU	DM
3	15/06/2009 17.11.49	SPU	DM
4	15/06/2009 17.11.50	SPU	DM
5	16/06/2009 16.43.51	DPU	PM
6	16/06/2009 17.11.47	SPU	PM
7	19/06/2009 17.11.52	SPU	DM
8	27/06/2009 17.11.54	SPU	PM
9	01/07/2009 17.11.58	SPU	DM
10	08/07/2009 19.35.31	SPU	DM
11	11/07/2009 19.26.38	DPU	PM
12	11/07/2009 19.26.41	DPU	DM
13	14/07/2009 19.26.43	DPU	DM
14	16/07/2009 19.35.37	SPU	DM
15	17/07/2009 19.26.45	DPU	PM
16	22/07/2009 19.26.50	DPU	PM
17	24/07/2009 19.26.54	DPU	DM
18	25/07/2009 19.53.42	SPU	DM
19	27/07/2009 19.53.42	SPU	DM
20	29/07/2009 19.26.59	DPU	DM
21	31/07/2009 11.04.19	SPU	DM
22	04/08/2009 19.27.06	DPU	DM
23	10/08/2009 11.04.27	SPU	DM
24	13/08/2009 11.04.25	SPU	PM
25	15/08/2009 11.04.26	SPU	PM
26	16/08/2009 05.52.20	DPU	DM
27	16/08/2009 11.04.27	SPU	PM
28	19/08/2009 19.27.19	DPU	PM
29	22/08/2009 11.04.35	SPU	DM
30	31/08/2009 09.36.47	SPU	DM
31	01/09/2009 11.04.41	SPU	DM
32	09/09/2009 11.04.49	SPU	DM
33	20/09/2009 19.27.53	DPU	PM
34	25/09/2009 19.27.57	DPU	PM
35	27/09/2009 19.28.02	DPU	DM
36	03/10/2009 11.04.58	SPU	PM
37	05/10/2009 19.28.08	DPU	PM
38	05/10/2009 19.28.09	DPU	PM
39	06/10/2009 19.28.12	DPU	DM
40	09/10/2009 11.05.06	SPU	DM
41	13/10/2009 11.05.05	SPU	DM
42	16/10/2009 11.05.10	SPU	DM
43	17/10/2009 19.28.22	DPU	DM
44	18/10/2009 11.05.10	SPU	DM
45	22/10/2009 11.05.07	SPU	PM
46	22/10/2009 11.05.11	SPU	DM
47	26/10/2009 11.05.13	SPU	PM
48	26/10/2009 11.05.14	SPU	DM
49	28/10/2009 11.05.14	SPU	DM
50	04/11/2009 11.05.18	SPU	DM
51	06/11/2009 11.05.19	SPU	DM
52	12/11/2009 19.28.49	DPU	DM
53	20/11/2009 19.28.56	DPU	PM
54	24/11/2009 11.05.27	SPU	PM
55	26/11/2009 11.05.36	SPU	DM
56	30/11/2009 11.05.36	SPU	DM
57	01/12/2009 19.29.06	DPU	PM
58	02/12/2009 11.05.32	SPU	PM
59	02/12/2009 11.05.34	SPU	DM
60	03/12/2009 11.05.32	SPU	PM
61	03/12/2009 19.29.11	DPU	DM

62	05/12/2009 11.05.34	SPU	PM
63	06/12/2009 19.29.12	DPU	PM
64	08/12/2009 08.18.52	SPU	DM
65	17/12/2009 11.05.36	SPU	DM
66	23/12/2009 19.29.21	DPU	PM
67	24/12/2009 16.03.57	SPU	DM
68	29/12/2009 11.05.43	SPU	DM
69	03/01/2010 19.29.33	DPU	DM
70	03/01/2010 20.05.07	SPU	PM
71	04/01/2010 11.05.50	SPU	DM
72	04/01/2010 19.29.32	DPU	PM
73	06/01/2010 22.54.20	DPU	PM
74	10/01/2010 19.29.41	DPU	DM
75	16/01/2010 11.05.53	SPU	DM
76	17/01/2010 19.29.46	DPU	DM
77	22/01/2010 19.29.51	DPU	DM
78	23/01/2010 11.05.55	SPU	DM
79	03/02/2010 11:06:05	SPU	DM
80	08/02/2010 19:30:06	DPU	PM
81	11/02/2010 11:06:05	SPU	PM
82	12/02/2010 11:06:05	SPU	PM
83	15/02/2010 11:06:10	SPU	DM
84	23/02/2010 11:06:13	SPU	DM
85	26/02/2010 11:06:15	SPU	DM
86	28/02/2010 11:06:13	SPU	PM
87	01/03/2010 19:30:06	DPU	PM
88	01/03/2010 19:30:29	DPU	DM
89	02/03/2010 19:30:27	DPU	PM
90	04/03/2010 19:30:31	DPU	DM
91	05/03/2010 11:06:17	SPU	PM
92	09/03/2010 19:30:34	DPU	PM
93	24/03/2010 19:30:51	DPU	DM
94	28/03/2010 19:30:52	DPU	PM

Table 5 LFI EDAC single events

No evident correlation between this kind of events and events causing a Gain change in the DAE electronics (See Tab. 1) is found. Below a plot showing the behaviour of both events starting from August the 10th, 2009.

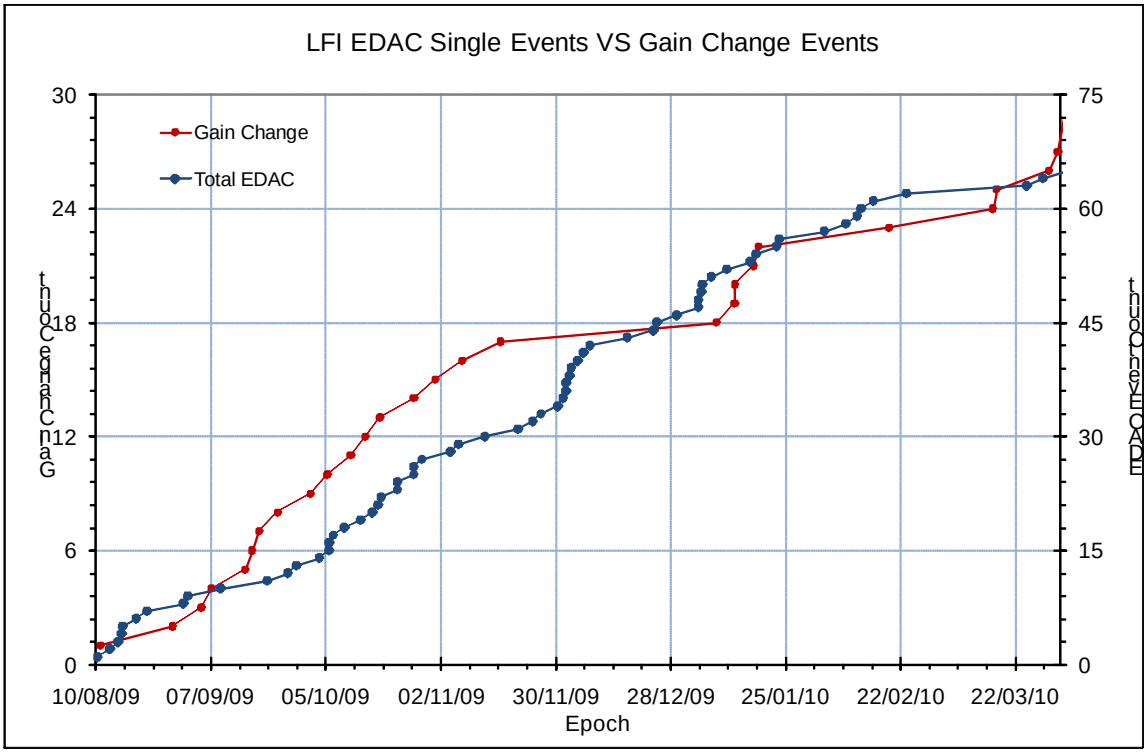

Figure 3 LFI EDAC single events VS DAE Gain change events

5.4 P_SC-54: SCS unexpected compressor temperature behaviour

As already seen in January, the only issue with SCS operations has been the increase of final desorption temperature of beds 4, 5 and 6 due to degradation. To avoid triggering of autonomous transition into Conditioning (Startup) state the bed temperature limit (see Table 2) has been increased again (after Jan 14th, OD246) from 500K to 515K on Feb 18th (OD281). An Anomaly Report (P_SC-54) has been raised, and the relative MRB called, in order to investigate this desorption temperature increase: bed temperature safety fault condition is set at 525K and bed 4 desorption temperature was rapidly approaching that value. JPL investigation concluded that this temperature increase and the extrapolated final temperature values at EOL are not a concern for the safety of the hardware. For this reason, it has been decided to raise the beds temperature fault limit up to the maximum allowed temperature for compressor elements safety (675K). This will be implemented in the first LUT update of April.

On ground, soft limits have been reached on Bed 4 final desorption temperature. This issue has been integrated in the general AR/MRB on compressor elements temperature (see above). Hard and soft limits will be updated on the basis of the MRB conclusions.

5.5 P_SC-53: SCS ground OOL on Bed2 Gas Gap heater current

An anomaly has been raised (AR-53) for an OOL on GG Heater Current (Bed2). SCS data analysis has confirmed that the issue is caused by a single point detection at the beginning of the transition into the ON-state (see), during the ramp up to the ON operational value. SCS

investigation concluded that such single events are not an issue for the cooler. In general the GG Actuators reach the operating current value in less than one second, so a change in the DB OOL trigger number from 1 to 2 consecutive occurrences is appropriate to avoid false OOL triggers.

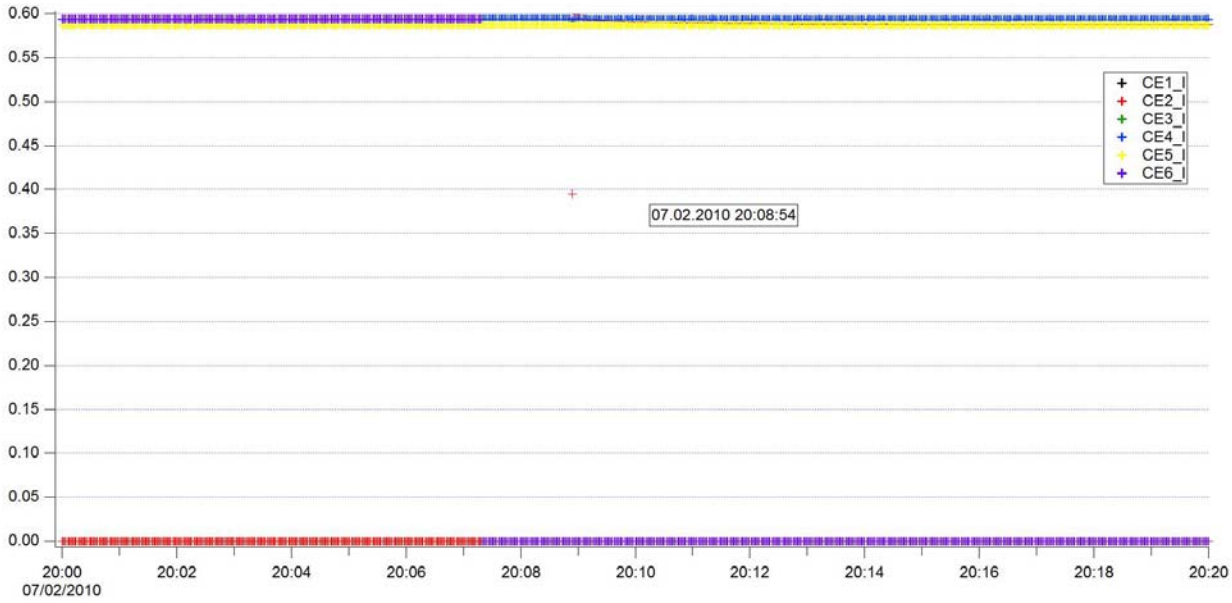

Figure 4 Bed2 GGA heater current detected OOL at the OFF-ON transition

6 Conclusions

All the LFI and SCS activities foreseen during these two months have been successfully completed.
In summary the LFI/SCS are healthy and behaving as expected.

7 Acknowledgements

This document has been issued in the frame of ASI contract that has been released for the activities of Planck-LFI Phase E2.