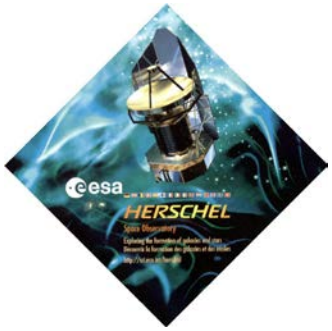

HERSCHEL SCIENCE CENTRE

Science Ground Segment

Science Operations Simulations Test Campaigns #1 & #2

Document Reference: HERSCHEL-HSC-DOC-1306

Release 3.1
SIMS-2 Update – Final Release

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1. Introduction

1.1 Scope

The purpose of this document is to provide a detailed description of the Science Ground Segment simulation activities to be performed prior to launch in two dedicated simulations campaigns.

The Simulations Campaigns will involve the Science Ground Segment being operated during two periods of 15 and 14 days respectively – 13 and 12 full ODs of simulated operations + a further day for set-up and for data propagation and Data Processing after the simulated observations have ended) in a Performance Verification Phase configuration, including weekend operations.

The activities to be performed are those activities which would nominally take place in the science ground segment during the commissioning and PV Phase. These correspond to “simulated” activities to be performed in all centres that allow the validation of interactions and procedures which are PV Phase specific, or for which the rapid turnaround required in PV Phase will present particular challenges to the Science Ground Segment Team e.g. HSC MPS planning, DP Pipeline, calibration table update etc. Although the spacecraft will not be in the loop – i.e. strictly speaking it will not be a full end-to-end test – the spacecraft will be simulated by using observations already run in the RMS, SOVT-1, SOVT-2, or other tests, supplemented, if possible, with SPIRE spectrometer data obtained with the flight spare.

1.2 Simulations duration

1.2.1 Simulations Campaign #1

The formal duration of the campaign will be 16 days, consisting of 14 full ODs, plus one day for set-up and one day for wind-up of activities. This duration will permit two full cycles of two ODs for each instrument, plus a day for commissioning procedures or similar activities.

1.2.2 Simulations campaign #2

The duration will be 16 days, consisting of 14 full ODs, plus one day for set-up and one day for wind-up. It is intended that Simulations Campaign #2 will be somewhat different to Simulations Campaign #1 to provide a different challenge to the SGS actors.

1.3 Dates of execution of the SIMS campaigns

1.3.1 Simulations Campaign #1

The campaign will be run from 2009 February 02 to 2009 February 17.

1.3.2 Simulations campaign #2

The campaign will run from 2009 March 09 to 2009 March 24.

1.4 Acronyms

ACMS Attitude Control and Measurement Sub-system
AGN Active Galactic Nucleus
AHF Attitude History File
AOR Astronomical Observing Request
AOT Astronomical Observing Template
AR Anomaly Report

DB Database
DDS Data Distribution System
DP Data Processing
DTCP Daily Telecommunications Period

E2E End to end
EE End to end
ESAC European Space Astronomy Centre

FD Flight Dynamics
FTP File Transfer Program
FTS File Transfer System

G/S Ground Segment
GMT Greenwich Mean Time

H/W Hardware
HAS Herschel Science Archive
HK Housekeeping
HSC Herschel Science Centre

IA Interactive Analysis
ICC Instrument Control Centre
ICS Instrument and Calibration Scientist
IST Instrument System Test

KPGT Key Programme Guaranteed Time

LO Local Oscillator
LSS Large Space Simulator

MIB Mission Information Base
MIRD Mission Implementation Requirements Document
MOC Mission Operations Centre
MPS Mission Planning System
MTL Mission Time Line

NOAA National Oceanic and Atmospheric Administration

OBSM On-Board Software Monitoring System
OD Operational Day
OOL Out of Limits
OT Open Time

OTF	On The Fly
POS	Planned Observation Sequence
PSF	Planning Skeleton File
PV	Performance Verification
R/T	Real Time
S/C	Spacecraft
S/W	Software
SGS	Science Ground Segment
SIAM	
SIP	Science Implementation Plan
SIRD	Science Implementation Requirements Document
SOVT	System Operational Validation Test
SPG	Standard Product Generation
SPT	Special Performance Test
SSO	Solar System Object
SVT	System Validation Test
TA	Technical Assistant
TBD	To Be Decided
TBC	To Be Confirmed
TC	Telecommand
TCH	Telecommand History
TM	Telemetry
ToO	Target of Opportunity
UT	Universal Time
Z	Zulu (= GMT = UT)

1.5 Definition of Simulations

The term "simulations" may be understood as follows:

For any planned test campaign involving the Spacecraft and/or instruments and exercising procedures or observational templates characteristic of real operational cases, a corresponding set of human interactions, information exchange and deliveries across interfaces can be identified by reference to the Operational Interactions governing the overall Herschel Observatory process and its sub-processes.

A "Simulation" refers to the exercise of those related elements of the overall process, organised in a realistic timeline and involving the personnel who will run the actual (sub-) processes. Therefore, a simulation will aim to exercise the corresponding components of the overall observatory process, including the human element.

1.6 Requirements & Important Points to Note

1.6.1 Requirements

While there is no formal *requirement* to hold Simulations Campaigns, the holding of Simulations Campaigns is *recommended* in the Science Implementation Requirements Document.

1.6.2 Points to note

The following considerations, adapted from the corresponding document with the Test Plan for SOVT-1 (HERSCHEL-HSC-DOC-1173) are valid for all operational activity, be it real or simulated. Any system or procedure that has been patched after SOVT-2 must demonstrate that it functions correctly and is ready for operations.

Point #1 - Every day lost when the spacecraft is in orbit due to spacecraft or ground segment problems is one day less of mission lifetime and one day less of scientific results being provided to the community. This is particularly critical for a cryogenic mission. A single day of helium corresponds to approximately 1 million Euros; if you prefer, each SECOND of wasted helium represents approximately 10 Euros. Great efforts have been made to optimise helium use to reduced wastage and maximise the lifetime of Herschel; these need to be backed-up by reliable spacecraft and ground system performance.

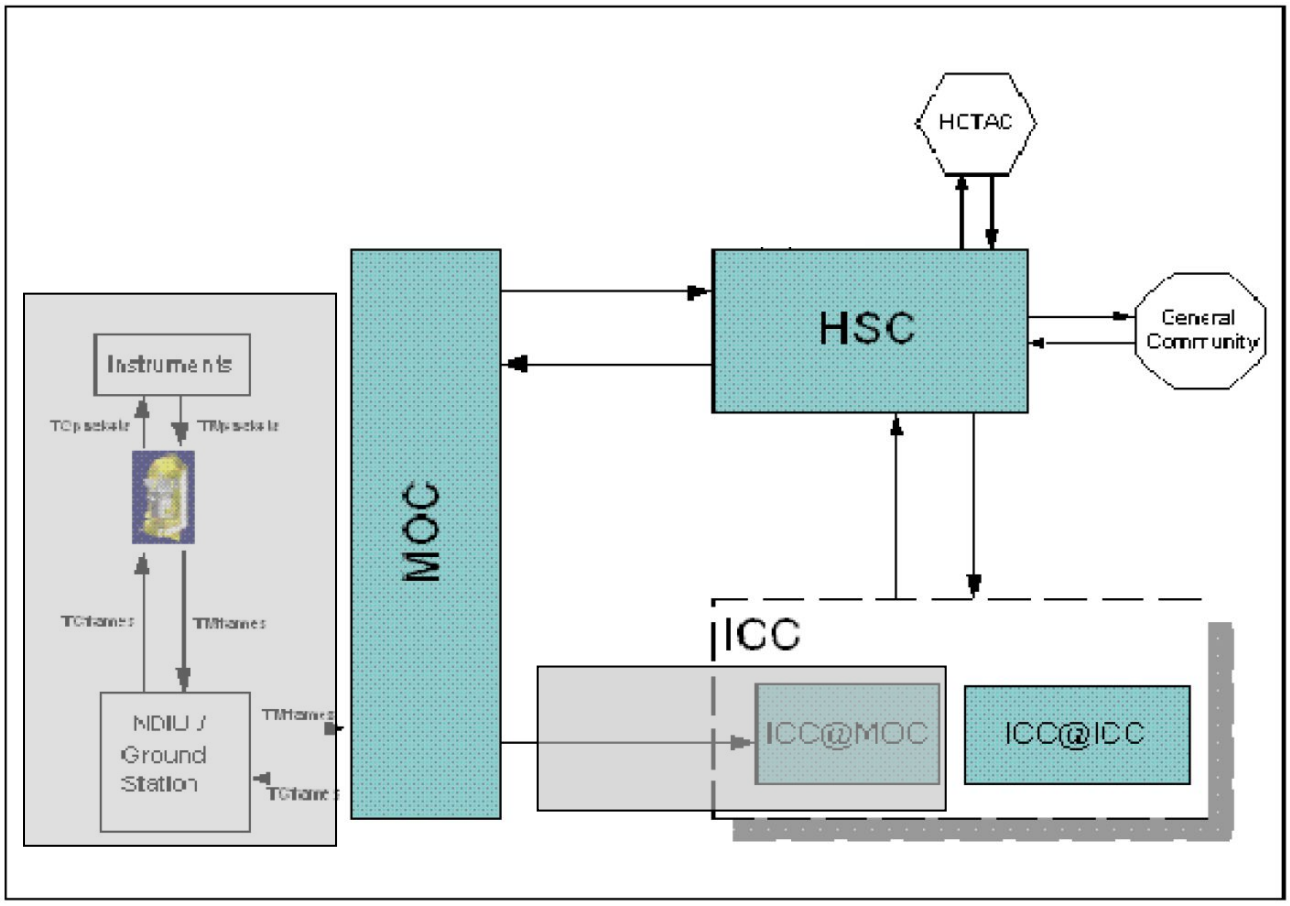
Point #2 - The running of simulations as a complement to the SOVTs is a necessary step to ensure that procedures applicable to the various phases of the mission are tested in the most realistic manner possible and that SGS personnel are trained to react efficiently in any circumstances. The recent exercise of planning SOVT-2 ODs demonstrated comprehensively the diagnostic value of such campaigns.

Point #3 - The simulations campaign is intended to also refine the methodologies for interacting between the sites during the various phases of the mission. In SIMS we will test two epochs of the PV Phase. The OD numbers proposed for the simulations campaigns are, for the moment, just proposals. Strictly speaking there may be no hard requirement to use contiguously numbered ODs to construct a simulations campaign, although the simulated ODs will be executed contiguously during the simulations exercise.

Point #4 - The simulations are going to be run in rigidly realistic conditions from a procedural point of view. This will be as close to operational reality as is possible and is required to identify possible problems and difficulties that may appear in the rarefied and demanding conditions of PV Phase operations, and how to resolve them.

1.7 Configuration of the Interfaces between Herschel Operational Centres

The structure of the Herschel Ground Segment interfaces, which will be operational in flight. This is the operational structure of the Herschel Ground Segment and defines how data is passed between centres and how data reaches the end user from the satellite. The parts that will be eliminated in the SIMS campaign are blocked-out, but real data that has passed through the full chain will be used.



The structure of the Herschel Ground Segment and the data flow between centres as it will be both during Simulations and in normal operations. Shaded out interactions will not be tested in the SIMS compaigns.

1.8 Initial Configuration of Software in the SGS (revised version from March 6th)

The standard configuration for software to be used throughout the SGS, overriding the version circulated by email on March 5th is, as follows:

1.8.1 HCSS User Release to be used for SIMS-2

The HCSS User Release to be used for Sims 2 shall be 0.6.7.0

The 0.6.7.1 build was not successful and it has therefore been decided to use 0.6.7.0 instead.

1.8.2 Specific software versions to be used for SIMS-2

1.8.2.1 MPS Version to use

MPS = 0.6.7.0

Important Note : We will be rolling out a totally new version of the MPS for the start of the second week of SIMS-2.

1.8.2.2 Proposal handling System version to use

PHS = 4.1.1

Important Note : We will be rolling out an updated PHS version for the start of the second week of Sims2 which will contain some specific updates e.g. Mission Configuration GUI.

1.8.2.3 HSpot/Jboss version to use

HSpot = 4.1.1

When the Jboss is updated at the ICCs then this version should connect to their DBs located at the ICCs.

1.8.2.4 Herschel Science Archive

The HSA to be used for SIMS-2 is 1.5

HSA User Interface 1.5 is available at:

http://archives.esac.esa.int/hsa/index.html

This HSA release includes the release of the independent subsystem HAIO 1.5, which can be found at:

http://archives.esac.esa.int/hsa/aio

1.8.3 Data Files & versions to be used for SIMS-2

SIMS-2 shall be run using the same uplink deliveries made by the ICCs to the HSC for SIMS-1.

In this respect, all mission planning & proposal handling relevant files which have been used for those deliveries remain valid for this upcoming simulation.

A new delivery is expected of OD-78 which covers/address the agreed operational interactions for Parallel mode between the three sites involved.

1.8.4 DB to be propagated from the HSC to the ICCs for SIMS-2

The DB to be propaged from the HSC to the ICCs for SIMS-2 - week 1 shall be:

hsc_ops_simulations_1_a

1.8.5 Hardware & access to the Lease Lines

Our Herdb01 machine is the location of our DB which shall be propagated to the ICCs

The HSC FTP Ops account is located on our herfts01 machine.

Both of the machines above are accessible via the lease line and are our baseline for the first week of SIMS-2. We may update this configuration in the second week depending upon availability of our new acceptance test server.

1.8.6 HCSS 0.6.7 Release Note (issued 2009 March 4th)

The user release candidate HCSS 0.6.7 RC4 testing has been finished successfully and so, it has been accepted as operational version.

This means that the user release HCSS 0.6.7 is composed by:

HCSS-CORE 356
HCSS-APPS 96
DP-CORE 527
DP-HIFI 322
DP-PACS 345
DP-SPIRE 334

From now on, any further changes required to this release (based on the discovery of bugs through its life cycle), should go through the cCCB approval process.

Please, be also aware that, unless otherwise specified, this is the version of the software to be used for the SIM-2 campaign.

2. Simulations Campaign (SIMS) – Objectives & High Level Event Timeline

2.1 SIMS: Some background information

2.1.1 The purpose of the SIMS

The SIMS campaign is the final element in a long series of spacecraft and ground segment tests. Its aim is mainly, but not exclusively, to test and train the human element of the SGS and to fine-tune procedures and interactions, while at the same time providing additional opportunities to debug the SGS sub-systems.

The key aim of the simulations campaign is to have the SGS, which has been de-bugged in the two SOVTs, carry out two periods of intensive and realistic training for operations. This training will, as in SOVT-2, simulate the Commissioning and PV Phase of the Herschel mission. The two, long simulation campaigns of two weeks duration each will hone the SGS personnel's knowledge of and efficiency in carrying out operational procedures in realistic conditions that approximate closely to a flight situation, although, unlike in SOVT-2, without the spacecraft in the loop and with reduced interactions with MOC.

The SIMS campaigns will also serve as an exercise in which Group Leaders will have to resolve the administrative problems associated with maintaining a 10/7 level of effort during the extended PV Phase. The SIMS campaigns will help teams to identify the difficulties that they will have to maintain an adequate level of cover in PV Phase and to find the solutions necessary to operate successfully for an extended period without burn-out of personnel.

2.1.2 Why do we need SIMS?

Every day lost when the spacecraft is in orbit due to spacecraft or ground segment problems is one day less of mission lifetime and one day less of scientific results being provided to the community. This is particularly critical for a cryogenic mission such as Herschel.

As a result, to avoid helium wastage (1 day of helium lost is equivalent to 1 million Euros = 10 Euros per second), system tests of the S/C and ground segment together must be performed before launch to catch as many problems as possible before in-orbit operations begin and to improve in-flight operational efficiency. Although 100% efficiency is obviously impossible, we have a duty to the scientific community to attain as high an operational efficiency as is reasonably practical. As the Commissioning and PV Phase are particularly demanding, taking up as much as 6 months of spacecraft time with intensive in-flight testing and science demonstration to ready Herschel and its instruments for use by the scientific community, it is especially important that SGS personnel be able to handle these activities confidently and efficiently.

The SIMS are the final link in a chain of tests and operational campaigns that exercise all elements of the SGS and ensure that all the elements of the SGS are properly tested and flight-ready before launch.

2.1.3 Where do the SIMS fit into the overall timeline to launch?

The following is the time line of key events to launch as of the SciOpsWG meeting of 06/11/2008 (SciOpsWG #14). It shows where SIMS fits into the logical sequence of pre-launch activities that lead to having the spacecraft, systems, instruments, SGS and personnel totally flight-ready. Although some of these dates have changed, the sequence remains as valid now as it was at the time.

SciOpsWG Schedule Review

Issue 1.0 of SGS SOVT-2 Test & Sims. Plan from HSC	11 Nov. 2008
CUS scripts and AORs for SOVT-2 from ICCs to HSC	14 Nov. 2008
Delivery of POS files for SOVT-2 from HSC to MOC	21 Nov. 2008
SOVT-2 TRR	27 Nov. 2008
Herschel pre-launch Data Processing Workshop	04-05 Dec. 2008
SOVT-2 (He II) execution	05-12 Dec. 2008
SciOpsWG#15(telecon) @10:30	15 Dec. 2008
SOVT-2 TRB @14:30	15 Dec. 2008
AOR content of 2+2 ODs per instrument for use in SGS Pre-flt. Sims	18 Dec. 2008
Simulations Plan Draft 1.0	18 Dec. 2008
CUS scripts and AORs for SOVT-2 from ICCs to HSC	16 Jan. 2009
AORs and POS for Model PV Phase from ICCs to HSC	16 Jan. 2009
PV Phase validation	mid-Jan. to launch
SciOpsWG#16 (meeting)	28 Jan. 2009
1st. 14 day pre-flight Simulations across the SGS	mid-Feb. 2009
2nd. 14 day pre-flight Simulations across the SGS	mid-Mar. 2009
Launch of Herschel	12 Apr. 2009

2.1.4 Prerequisite for the start of the SIMS

The majority of the SIMS campaign will take place after Herschel has been shipped to Kourou for the launch campaign. As such, it will be run while Herschel is in a flight-ready configuration. As a prerequisite for the SIMS, the SOVT-2 test should have been executed successfully and the software should be approaching a stable, flight-ready state.

2.1.5 Additional prerequisite for SIMS #2

HCSSMG Telecon #132 of February 13th 2009 defined that HCSS 0.6.7 will be the formal launch version, which was previously intended to be HCSS v1.0. It was further defined in the 1st SIMS #2 Readiness Videocon that both the hardware and software versions for SIMS #2 should be frozen as the launch configurations. Thus it is a prerequisite for SIMS #2 that both the hardware and the software should have reached a stable launch configuration.

2.1.6 What is the difference between SOVT-2 and SIMS?

The LEOP, Commissioning (CoP), PV and Science Demonstration Phases of the Herschel mission will last for about 6 months in total. During this period of the mission, the performance of each of the instruments must be checked and verified and each of the sub-modes commissioned successfully and released for use by the astronomical community. PV Phase is an essential part of the mission allowing the in-flight performance

of the instruments to be characterised, observing strategies to be optimised to in-flight reality and a first, reliable in-flight calibration to be performed. PV Phase is a long and extremely intense period of activity, which will test the SGS team's endurance and problem-solving ability under stress with a team sized for routine operations. In contrast, in routine operations all aspects of Herschel operations will have become polished and much more automatic.

In SOVT-2 the PV Phase was simulated with the spacecraft in the loop and the instruments functioning and taking data. SOVT-2, like SOVT-1 (which validated Routine Phase SGS activities), was a complete end-to-end test that included every element of the SGS apart from the ground station that will be used in flight (and even that was simulated using a low power transmitter in the test). In the SIMS we will take advantage of observations that have already been performed in RMS, SOVT-1, SOVT-2 and possibly other tests to provide data to the downlink chain, re-playing data that has already been taken.

In SOVT-2 the End-to-End Test aspect took priority over training of personnel: their exclusive aim was to de-bug the system, with any training achieved simply value added to the exercise. In reality, the 2 ODs of RMS, the 4 ODs of SOVT-1, or the 5 ODs of SOVT-2 are unrealistic of operations as they will be performed in reality as they represent short sprints rather than the marathon that will be the Herschel PV Phase. While it is neither practical nor necessary to have a simulation of similar length to the PV Phase, a two-week duration of each SIMS test is close enough to reality to provide a unique training opportunity. With two simulations periods, separated by an interval of similar duration, we simulate many of the management issues that the real PV Phase will generate within the different SGS teams. Simulations are thus an essential training opportunity to prepare the SGS team for the challenge of the first six months of the mission that will set the groundwork for a successful and highly productive routine phase to be achieved.

2.2 SIMS – Test Objectives

2.2.1 The Scope of SIMS #2

The scope of SIMS #2 is defined as a full end-to-end cycle of the entire Science Ground Segment with full ICC support and targeted MOC support, respecting the Test Plan and following the established deadlines for deliveries faithfully.

2.2.2 Top level Objective:

The top level objective is training of personnel and fine-tuning of the ground segment behaviour and procedures in a Performance Verification Phase configuration.

2.2.3 Detailed Objectives:

2.2.3.1 Identification of remaining timing constraints and data product processing issues after SOVT-2

Estimated transfer and process times shall be confirmed that are specific to the demanding conditions of the PV Phase, especially the impact of transfer times on the expected start of successive processes. The identification of bottlenecks in system processes, where an underperformance in transfer, or in a sub-process, causes delays, has been an objective of SOVT-2: SIMS #1 will demonstrate whether or not the remedial measures have been effective and what additional palliative measures are required. In SIMS #2 we expect to demonstrate that all issues have been identified and remedied successfully.

2.2.3.2 Validation of Ground Segment stability and robustness over an extended period

The SGS hardware, software and communication lines are used in an operational context for 24 hours per day for two extended periods of approximately 15 days each. Forced contingencies may be included and the SGS must demonstrate that unexpected outages can reliably be covered by redundancy. In this the PV Phase requirements are more stringent than those of the Routine Phase due to the tight deadlines on activities.

2.2.3.3 Identification of unexpected problems in an extended period of demanding operations

Complex systems conceal unexpected behaviour when exercised to their full capability. As the SOVTs demonstrated, the stress of intensive system-wide interactions can make apparently reliable systems fail unexpectedly for reasons that are only clear with the benefit of 20-20 hindsight. Most of these problems should have been detected in SOVT-1 and SOVT-2, but further issues may remain that will only reveal themselves when the SGS is operated for an extended period. The only way to find and fix these unpredictable problems is by running intensive testing in circumstances that are as realistic as possible.

2.2.3.4 Training of SGS personnel and honing of work practices

The PV Phase will test SGS personnel to the limit as it represents an extended period of very intensive 24/7 activity in the SGS, even if personnel will not normally be on site 24/7. The conditions of such activity are totally different to those of a short test such as SOVT-2 in which the test activity takes precedence over the simulations aspect.

Over a short test there is no need for shift working and personnel can maintain a high intensity of effort through the duration of the test. In the real PV Phase the need for shift-working to avoid exhaustion and burn-out of personnel is clear. The SIMS campaigns will allow the work strategies to be tested and perfected. Similarly, PV Phase makes stringent requirements for Data Processing, analysis of products and re-planning that impact the whole SGS: there will be a requirement for fast reaction and quick turnaround from DP, ICCs, Mission Planning and MOC. These activities will have to be carried out against strict deadlines and in less than ideal circumstances at any time of the week and even, occasionally, outside normal working hours and in the absence of key personnel. Only an extended and intense campaign of activity will train personnel to carry out these activities efficiently, even in the most difficult circumstances.

One of the key objectives of the SIMS campaign is for individual teams to examine and resolve the issues of maintaining adequate cover during the extended PV Phase while, at the same time, allowing adequate rest and recovery time for team members and dealing with the normal day-to-day issues of sick leave and time off. Another is identifying the problems that personnel have with support services when attempting to maintain an adequate 10/7 coverage: such problems may not always be obvious in advance.

2.2.3.5 Success criteria for SIMS #2

SIMS #2 should be declared a success if:

- It demonstrates that the flight configuration of both the SGS hardware and software is capable of supporting nominal PV flight operations.
- The Data Distribution System functions nominally for at least 5 consecutive days at the end of the test, or for a period of at least 5 consecutive days during the test without a major failure.

- If it demonstrates that operating procedures are robust enough to support flight operations.
- If no previously unknown, major vulnerabilities of the system are found.

2.3 SIMS – Practical Objectives

2.3.1 How the objectives were defined

The practical objectives for the SIMS campaign have been determined by asking the following questions in this order of priority:

(i) What activities and durations of activities are required to simulate adequately the PV Phase?

(ii) How may the AORs run in RMS, SOVT-1, SOVT-2 and possibly other tests be most effectively used?

(iii) What sequence of activities is required to test effectively a representative PV Phase re-planning cycle?

(iv) What modifications might be introduced between SIMS #1 and SIMS #2 to ensure that the two periods present complementary questions and problems to the SGS?

2.3.2 The activities planned for SIMS

There was a long list of objectives for the SOVT-2 test that may be found in the "SOVT-2: Objectives & Contents – Science Ground Segment Specific" document (HERSCHEL-HSC-DOC-1215). A number of these objectives apply equally to the SIMS campaign that also takes the LEOPS/PV Phase as baseline, although the focus of the tests is obviously different. The following are simply a sample:

- Execution of specific Instrument PV Phase activities.
- Validation of a representative re-planning cycle i.e. execution of observations, analysis of data, feedback into MTL.
- Pointing Calibration Plan Activities.

2.4 The sequence of instrument activities

The diagram below shows the planned sequence of activities for the SIMS#2 campaign, ordered as a grid. Different colours denote the different instruments or activities for each day. Note that each OD runs from 12:00z to 12:00z the next day. In other words, Day 1 (OD-65) of SIMS #2 uplink activities starts at 12:00z on Monday March 9th and ends at 12:00z on Tuesday March 10th. Similarly, downlink (data propagation) starts at 12:00z at ends around 01:00z on the following day, hence the final DP activities will take place during the night of the last day of the test activities shown in the diagram

The sequence of activities in uplink consists of a series of pairs of ODs using the same instrument, in the sequence SPIRE, PACS, HIFI.

Sims #2																
Date	09/03/2009		10/03/2009		11/03/2009		12/03/2009		13/03/2009		14/03/2009		15/03/2009	
	am	pm	am	pm	am	pm	am	pm	am	pm	am	pm	am	pm
Active	Preparation	Pointing	Pointing	SPIRE	SPIRE	SPIRE	SPIRE	PACS	PACS	PACS	PACS	HIFI	HIFI	HIFI
Day Number	0	1	1	2	2	3	3	4	4	5	5	6	6	7
OD Number		65	65	66	66	67	67	68	68	69	69	70	70	71

Date	16/03/2009		17/03/2009		18/03/2009		19/03/2009		20/03/2009		21/03/2009		22/03/2009	
	am	pm	am	pm	am	pm	am	pm	am	pm	am	pm	am	pm
Active	HIFI	SPIRE	SPIRE	SPIRE	SPIRE	PACS	PACS	PACS	PACS	HIFI	HIFI	HIFI	HIFI	SPParallel
Day Number	7	8	8	9	9	10	10	11	11	12	12	13	13	14
OD Number	71	72	72	73	73	74	74	75	75	76	76	77	77	78

Date	23/03/2009		24/03/2009		25/03/2009	
	am	pm	am	pm	am	pm
Active	SPParallel	Wind-up	Wind-up	Wind-up	DP workshop	DP workshop
Day Number	14	14	14	14		
OD Number	78					

A single SPParallel OD is added at the end of the sequence and an OD of commissioning, or similar, activities added at the start. Otherwise there is a simple, repeated 3x2 OD sequence of instrument activities.

2.4.1 OD numbering and justification

2.4.1.1 SIMS #1

2.4.1.1.1 OD numbering

The ODs for SIMS #1 will be numbered from OD-65 to OD-78.

2.4.1.1.2 Justification

To facilitate Mission Planning activities the numbering of the ODs for SIMS #1 will follow directly on from the already planned ODs of SOVT-2. As the typical minimum visibility window is 60 days we maximise the probability that sources visible during SOVT-2 will also be visible during the SIMS #1 campaign.

2.4.1.2 SIMS #2

2.4.1.2.1 OD numbering

The ODs for SIMS #2 will be numbered from OD-65 to OD-78.

2.4.1.2.2 Justification

To facilitate Mission Planning activities the numbering of the ODs for SIMS #2 will follow directly on from the already planned ODs of SOVT-2 for which data is propagated during SIMS#2. We will thus use the deliveries made by the ICCs for SIMS#1, starting SIMS#2 with the database in its initial state at the start of SOVT-2. In this way we avoid having to request an additional delivery of AORs from the ICCs and can repeat the planning exercise of SIMS#1 in nominal conditions.

2.4.2 Re-planning of ODs

A vital part of PV Phase activities is a typically 6-day cycle in instrument scheduling. Each instrument will typically have telescope time programmed in 2-day blocks, with a 4-day period afterwards for data analysis before the next block of observations. This will give the ICCs the opportunity to revise their observing plan to take into account the following eventualities:

- Failed observations that need to be repeated.
- Observations that give unexpected results, which need to be verified.
- Changes in observational priority as a consequence of previous observations.
- Changes in calibration needs as a function of the progress of Commissioning and PV activities.

In reality, as is explained in Section 2.4.4, operational realities make it difficult to manage a full turnaround on this 6-day cycle, so we anticipate that the most rapid turnaround will only be exercised in an emergency, or that for a slightly less compressed fast turnaround, the first day of a two-day block being used to re-plan the second day of the following block. More frequently, the ICCs will use the analysis of the observations in Block N to re-plan the observations in Block N+2, where the interval in time between the end of Block N and the start of Block N+2 is 10 days.

2.4.3 Instrument inputs for the SIMS-2 campaign

2.4.3.1 SIMS #1

The following observations are required:

- PACS observations to fill 4 ODs.
- SPIRE observations to fill 4 ODs.
- HIFI observations to fill 4 ODs.
- SPParallel observations to fill 1 OD.
- Pointing or commissioning observations to fill 1 OD.

It is quite acceptable to repeat observations from one OD, if necessary, in a later OD, or even in the same OD. Real calibration observations may often be systematically repetitive.

2.4.3.2 SIMS #2

The AORs delivered for SIMS #1 will be re-used in SIMS #2. The re-deliveries made in SIMS #1 will also be re-used to test the re-planning cycle, so no additional deliveries are required from the ICCs for the SIMS #2 exercise.

The exception is that no valid delivery of OD-78 (SPIRE PACS Parallel Mode) was made for SIMS #1, thus a new delivery of this OD only will be required.

2.4.4 Turnaround time and cycle for re-planning the Mission Time Line

2.4.4.1 Testing the re-planning cycle

In PV phase instruments will typically be scheduled in 2-day blocks, that is, with a 6-day planning cycle. This allows instruments 4 days to receive and analyse each set of 2-day data that is obtained before the next block of observations start.

An essential part of the SIMS activities is to test the turnaround time in the MTL, uploading a revised MTL with new observations parameters derived from previous ones in a more realistic way than the very intensive test on an extremely compressed timeline that was carried out in SOVT-2. A second essential part of SIMS is to demonstrate the ability to carry-out continuous re-planning, instrument by instrument, over an extended period.

2.4.4.2 Standard turnaround scenario

For non-urgent re-planning, the typical cycle will be for the re-planned observations to be made, not on the next instrument cycle, but on the following one such that OD-N would be re-planned in OD-N+10, i.e. 10 days after completion of the observations to be re-planned. This allows the ICCs a more relaxed schedule to receive, process and analyse the observations, before deciding what changes need to be made and planning them.

However, it is understood that on some occasions it will be necessary for the ICCs to exercise a faster turnaround time. There are two options for much faster turnarounds, which are described in the next two sections.

2.4.4.3 Normal “quick turnaround” scenario

An example of the way that this will work if a fast re-plan using the 6-day cycle is required – for example, if a critical calibration has failed, which must be re-planned quickly – is the following:

Day 2 – OD-66 (SPIRE)
Start 12:00z. Execution of OD-66 observations through the remainder of Day 2 and up to 12:00z on Day 3.
Nominally, OD-68 uploaded

Day 3 – OD-67 (SPIRE)
Start 12:00z.
Nominally, OD-69 uploaded (in reality, we do not upload because the spacecraft is not in the loop).
Data from OD-66 starts becoming available to the HSC and on to the ICCs approximately 12:40z, although is initially all House Keeping.
Around 14:00z the first science packets start to arrive.
As data arrives at the HSC throughout this period it is propagated to the ICCs within seconds.

Day 4 – OD-68 (PACS)
00:00z: Final science packets from OD-66 arrive. The exact time depends on the instrument and the data, with HIFI generally finishing earlier and PACS a little later.

01:00z: HSC runs the SPIRE TM proc to generate the SPIRE Data Frames and starts pipeline processing.

09:00z: SPIRE ICC starts analysing their observations from OD-66.

12:00z: OD-68 starts.
Nominally, OD-70 uploaded.
Data from OD-67 starts becoming available to the HSC and on to the ICCs.

By end of afternoon: SPIRE decides if the data from OD-66 makes an urgent re-planning of OD-73 necessary and, if necessary, starts to prepare a re-delivery to HSC[2].

Day 5 – OD-69 (PACS)
00:00z: Final science packets from OD-67 arrive. First SPIRE run complete.

01:00z: HSC runs the SPIRE TM proc to generate the SPIRE Data Frames and starts pipeline processing.

09:00z: SPIRE ICC starts analysing their observations from OD-67.

12:00z: OD-69 starts.
Nominally, OD-71 uploaded.
Data from OD-68 starts becoming available to the HSC and on to the ICCs.
SPIRE re-delivers OD-73 to HSC.
HSC starts re-planning of OD-73.

Day 6 – OD-70 (HIFI)
00:00z: Final science packets from OD-68 arrive.

02:00z: HSC runs the PACS TM proc to generate the PACS Data Frames and starts pipeline processing.

08:00z: PACS ICC starts analysing their observations from OD-68.

12:00z: OD-70 starts.
Nominally, OD-72 uploaded.
Data from OD-69 starts becoming available to the HSC and on to the ICCs.

15:00z: HSC re-delivers OD-73 to MOC.

By end of afternoon: PACS decides if a re-planning of OD-75 is necessary and starts to prepare a re-delivery to HSC.

Day 7 – OD-71 (HIFI)
00:00z: Final science packets from OD-69 arrive.

02:00z: HSC runs the PACS TM proc to generate the PACS Data Frames and starts pipeline processing.

08:00z: PACS ICC starts analysing their observations from OD-69.

12:00z: OD-71 starts.
Nominally, OD-72 uploaded.
Data from OD-70 starts becoming available to the HSC and on to the ICCs.
PACS redelivers OD-75 to HSC

[2] Note that the normal lead time for MOC processing of a re-submitted POS file does not, in principal, allow OD-72 to be re-planned based on analysis of the observations of OD-66.

HSC starts re-planning of OD-75

Day 8 – OD-72 (SPIRE)
00:00z: Final science packets from OD-70 arrive.

02:00z: HSC runs the HIFI TM proc to generate the HIFI Data Frames and starts pipeline processing.

08:00z: HIFI ICC starts analysing their observations from OD-70.

12:00z: OD-72 starts.
Nominally, re-planned OD-73 uploaded.
Data from OD-70 starts becoming available to the HSC and on to the ICCs.

2.4.4.4 Emergency (fastest) turnaround cycle

Note that, as shown above, in most cases the overhead on re-planning is such that, on OD-N, any re-planning would normally be for OD-N+4. However, there is the possibility, in an emergency, to go for the fastest possible turnaround cycle, re-planning OD-N+3: this though imposes extremely tight deadlines on deliveries, very little time for data analysis before re-planning and little margin for the HSC Mission Planners. In this case the delivery would need to be made to the HSC by 09:00z the following morning to reception of data, to allow an adequate margin to solve any potential problems with the delivery.

As this cycle effectively obliges an ICC to work out of normal working hours and puts great pressure on the HSC Mission Planners, it is expected that it will be sparingly used in the PV Phase to avoid burn-out of personnel.

2.4.4.5 What was achieved in SIMS #1

SIMS #1 achieved approximately 80% of the initial aims expressed above. The procedures for deliveries and re-deliveries in PV Phase were thoroughly exercised and some fine-tuning applied. In this sense SIMS #1 was a complete success. Where SIMS #1 failed to achieve its aims was in two respects:

1. Due to the continuous recovery situation in week 1 of SIMS #1, the timeframe for re-planning was not successfully followed at the HSC, although the ICCs were successful in following the re-delivery schedule perfectly for a fast turnaround cycle (Section 2.4.4.2).
2. Two re-deliveries of the SPIRE PACS Parallel Mode day (OD-78) were made, but neither was successful in resolving the difficulties with the initial delivery.

2.4.4.6 What will be done in SIMS #2

As the ICC part of the re-delivery cycle was a complete success, there is no necessity to repeat it. The re-planning cycle can be tested adequately using the re-deliveries that have already been made, without any further input from the ICCs apart from the re-delivery of OD-78.

2.4.4.6.1 Week 1

During Week 1 of SIMS-2 we will do the following

- Start with the database as it was at the start of SOVT-2.
- Re-plan OD-64 to bring the database up to date.
- Plan OD-65 to OD-78 with the deliveries made for SIMS-1.
- During Week 1 a SIAM update or similar will be introduced and the POS files will need to be re-generated.
- At the end of the week, on Friday, Saturday and Sunday 6th, 7th and 8th, the updated deliveries made by the ICCs for OD-73, OD-75 and OD-77 respectively will be re-planned.
- In parallel, the PV Phase deliveries will be processed and planned.

2.4.4.6.2 Week 2

At the start of Week 2 we will return to an empty database, without the re-planned OD-64.

- OD-64 to OD-78 will be re-loaded from the SSF files.
- The DTCP time will be adjusted to the real DTCP time for PV Phase operation.
- A major configuration change may be introduced that would call for significant re-planning.
- A contingency may occur.
- PV Phase delivery processing will continue, with the aim of having the whole CoP and PV Phase delivery scheduled by the end of the week.

2.5 What is the difference between SIMS-1 and SIMS-2?

In terms of the uplink for SIMS-1 and SIMS-2 there is very little difference. The sequence of instruments is slightly different, but essentially the same. However, the activities within the SGS are different and the observing context is completely different for the two campaigns.

2.5.1 SIMS-1

Essentially the plan for SIMS-1 broke down into two halves with different aims.

2.5.1.1 Week 1

Week 1 of SIMS was intended as a confidence-building exercise. During this week the aim was to carry out what was effectively a re-run of SOVT-2. The aim is to show that the Data Distribution System can, in the new configuration for operations, work for a week with no problems. An essential part of the test will be to show that a stability of the system has been achieved and that the remedial actions after SOVT-2 have led to a considerable increase in the system's reliability.

- Nominal operations will be assumed.
- There will be no forced contingencies during the first 5 days of SIMS-1.
- Personnel will carry out de-bugging, as required, but will be expected to familiarise themselves with the system as it will operate in nominal operations.

2.5.1.2 Week 2

It was assumed that Week 1 of SIMS-1 had gone well and that the system was stable and had operated nominally, without important problems. Personnel would have started to acquire confidence in the stability and reliability of the SGS and in their personal tasks during PV Phase. In this case it is a valid exercise to use Week 2 of SIMS-1 to exercise some contingencies, both to test the ability of the system to recover from failures and to prepare personnel to react to situations that may be expected to occur in flight. These contingencies will be of two kinds

- Planned contingencies – these are system tests where the failure scenarios detailed in Section 3.1 will be carried out. As they are planned, the reactions of the team, although not the system, will be somewhat artificial.
- Unplanned contingencies – the Test Coordinator reserves the right to declare certain contingencies at any stage without prior warning. Teams will be expected to analyse the problem and react to it as they would in normal operations. Contingencies during this period will not be such as to overload a team unreasonably, but may reasonably test its readiness to react to unexpected events in non-optimal situations (e.g. when short-staffed, or at weekends).

2.5.1.3 What really happened in SIMS-1?

In reality, the SIMS-1 scenario was almost exactly inverted. Week 1 of SIMS-1 was marked by a series of unplanned contingencies that affected almost the entire downlink chain and had some indirect impact on uplink. This led to a rolling recovery situation in which the Test Plan was effectively abandoned. On the uplink side, many of the planned activities for SIMS-1 were accomplished, but inevitably without respecting the formal timeframe for deliveries and, even on the uplink side, planning of the Parallel Mode had to be abandoned due to the multiple difficulties that were found.

In contrast, Week 2 of SIMS-1 passed relatively smoothly as different problems were analysed and resolved. The last 5 days of SIMS-1 represented the nominal operations that were expected during the first week. However, given the lack of confidence in the state of the situation, the option of introducing planned contingencies was not exercised.

2.5.2 SIMS-2

2.5.2.1 The original baseline plan pre-SIMS

The original, baseline plan for SIMS-2 was that it is assumed that SIMS-1 has been performed acceptably and that the system is seen to be stable and reliable. Recovery scenarios have been tested successfully and that no major system issues have been detected. Personnel have carried out their nominal tasks in SIMS-1 without especial difficulties.

Given these starting conditions, during SIMS-2 a variety of more complicated, but realistic, operational contingencies would have been declared at any point.

2.5.2.2 The situation post-SIMS#1

2.3.2.2.1 How the original Baseline assumptions for SIMS-2 compare with reality

The baseline plan made the following assumptions:

- No major system issues have been detected

In fact, several major issues were detected that affected TMingest, propagation, database access and data processing. In some cases patches were made to the system that resolved them during SIMS-1. In others, hardware and configuration changes greatly mitigated the problem by the end of SIMS-1, while further patches are required to give a definitive solution to some of the issues: these patches will first be tested in SIMS-2.

- The system has been stable and reliable

In fact, the system was extremely unstable for the first eight days of SIMS-1 and only truly reliable for the last five days. Additionally, we will be using new hardware and software in SIMS-2 that will need to be tested, thus neither the hardware nor the software (HCSS 0.6.7) will be stable between SIMS-1 and SIMS-2.

- SIMS-1 has been complete successfully

Few of the objectives defined in the Test Plan were actually successfully accomplished. However, SIMS-1 was a great success from the perspective of system de-bugging, having been, effectively an SOVT-3 campaign. The fact that several days of nominal performance were achieved at the end of SIMS-1 was a bonus. As has been widely commented elsewhere, SIMS-1 failed in its initial primary aim of developing confidence in the performance of the system. Despite the system's good performance at the end of SIMS-1, it is essential that confidence be restored in the capability of the full chain of data handling to perform as we would desire it to in flight operations.

- Personnel have carried out their nominal tasks without especial difficulties.

This was the assumption that came closest to fulfilment. A significant part of the HSC personnel were able to complete their nominal tasks however, deadlines were not generally respected and there was a constant situation of playing catch-up. Routine system maintenance activities (e.g. SxR fixing) were generally subsumed by the need to make system patches and investigate unplanned contingencies. Personnel rotas could not be respected, as problem-solving required people to work on days when, nominally, they should have been resting.

2.3.2.2.2 Revised Baseline assumptions for SIMS-2

SIMS-2 is our last formal chance to test the entire SGS with full support from MOC and the ICCs. It also gives an opportunity to test the flight configuration for both hardware and software.

2.6 Milestones in the Timeline of SIMS preparations

Timeline to SIMS -- Major milestones		
Updated: 2009/01/26 17:30 CET		
All times are CET (GMT+1h, UT+1h, z+1h)		
Blue items are completed		
Red items are late		
Black items are highlights to come		
Activity	Start	End
ICCs given basic information on ODs and available time for SIMS	**14/12/2008**	
Initial draft 0.1 of SIMS Test Plan and Timeline document released	**14/12/2008**	
Revised draft 0.2 of SIMS Test Plan and Timeline	**14/12/2008**	

document distributed		
SIMS plan discussed by SciOpsWG #15	**15/12/2008**	
Draft 0.2 of SIMS Test Plan and Timeline document delivered	**18/12/2008**	
SGS SOVT-2 activities end	**19/12/2008**	
SPIRE SIMS delivery received	**13/01/2009**	
1st SIMS planning Videocon with ICCs	**14/01/2009 15:00**	
SIMS deliveries from ICCs to HSC due	**16/01/2009**	
System engineering SIMS scenarios delivered	**20/01/2009**	
HIFI SIMS #1 delivery received	**21/01/2009**	
HSC & ESAC Support Services Group Leaders requested to supply SIMS scenarios	**21/01/2009**	
2nd SIMS planning Videocon with ICCs	**22/01/2009 16:00**	
Release 1.0 of SIMS Test Plan and Timeline document distributed.	**23/01/2009**	
HSC Group Leaders to supply SIMS scenarios and rosters for work during SIMS #1	**27/01/2009**	
Discussion of SIMS preparations with ICCs at SciOpsWG meeting #16	**28/01/2009**	
Release 2.0 of SIMS Test Plan & Timeline document with inputs from all teams	**29/01/2009**	
SIMS #1	**02/02/2009**	**17/02/2009**
SIMS #2 1st preparatory Videocon	**18/02/2009 15:00**	
SIMS #2 baseline defined	**24/02/2009**	
SIMS #2 2nd preparatory Videocon	**25/02/2009 15:00**	
SIMS #2 first draft of Test Plan released	**27/02/2009**	
Initial configuration for SIMS #2 released	**27/02/2009**	
All SIMS #2 inputs received for Test Plan	**04/03/2009**	
Drop dead date for patches to 0.6.7	**04/03/2009**	
SIMS #2 3rd preparatory Videocon	**04/03/2009 15:00**	
SIMS # 2 Go/No Go decision	**06/03/2009**	
SIMS #2 Kick-off	**06/03/2009**	
SIMS #2 Final Test Plan released	**09/03/2009**	
SIMS #2	**09/03/2009**	**23/03/2009**
DP Spectroscopy Workshop	**24/03/2009**	**25/03/2009**
DP Photometry Workshop	**26/03/2009**	**27/03/2009**

The SIMS top level timeline. Other milestones are to be discussed at SciOpsWG #15

2.7 High Level Event Timeline of SIMS

2.7.1 SIMS Launch Date

The SIMS scenario is based upon a launch date of 12/04/2009.

2.7.2 SIMS –Epochs & Operational Day numbering

The epochs shall be from 15/06/2009 = 166/2009 (SIMS Day 1 – Operational Day 65 – OD-65) to 28/06/2009 = 179/2009 (SIMS Day 14 – Operational Day 78 – OD-78). At these epochs the satellite has passed the low Earth orbit and is in the transfer phase. No time-correlation shall be applied (00:00z = 00:00z), so the offset is an integer number of days.

Test Day	Scenario Day	Scenario DOY	Mission OD #
Day 1	15/06/2009	166/2009	65
Day 2	16/06/2009	167/2009	66
Day 3	17/06/2009	168/2009	67
Day 4	18/06/2009	169/2009	68
Day 5	19/06/2009	170/2009	69
Day 6	20/06/2009	171/2009	70
Day 7	21/06/2009	172/2009	71
Day 8	22/06/2009	173/2009	72
Day 9	23/06/2009	174/2009	73
Day 10	24/06/2009	175/2009	74
Day 11	25/06/2009	176/2009	75
Day 12	26/06/2009	177/2009	76
Day 13	27/06/2009	178/2009	77
Day 14	28/06/2009	179/2009	78

In other words, like the SOVTs, SIMS is based in the future and as such all systems receiving and processing the data must take this into account and the software must be made compliant with running in future time.

Note that these dates are fixed. A change of the real launch date during test preparations shall not result in any re-planning of the SIMS simulated dates.

The Operational Day Numbering (65 → 78) is what is used by Flight Dynamics in the generation of the mission planning input products (Planning Skeleton Files – PSFs).

The correlation for the start of OD-1 of SIMS-1 is thus:

Real Day	2009 February 2nd
Real UTC	12:00:00
Scenario Day	2009 June 15th
Scenario UTC	12:00:00
Scenario TAI	12:00:34

And for the start of OD-1 of SIMS-2:

Real Day	2009 March 9th
Real UTC	12:00:00
Scenario Day	2009 June 15th
Scenario UTC	12:00:00
Scenario TAI	12:00:34

2.8 Top-level summary of instrument and support activities during SIMS

The HSC will work on a 10/7 basis supporting SIMS #2 activities as they would in the real PV Phase. The exceptions to this rule are the Computer Support Group who will supply 24/7 cover for the first 9 days of the campaign and 12/7 cover thereafter and the Archives and Virtual Observatory Team who will offer 10/5 cover, with personnel on-call weekends and holidays. The support plan is shown in Appendix III.

Each team will carry it its normal support duties for PV Phase, supplemented by such training activities as are required by the respective Team Leaders. To these activities a number of unannounced scenarios will be added to train the overall team to react to unexpected contingencies.

All aspects of the SGS will be tested from data propagation through to the generation of quality products at the end of the DP chain on the downlink side, to POS generation from ICC inputs on the uplink side.

At the same time, teams will carry out a thorough de-bugging of the system and software in its flight configuration and the software and DP teams will apply such patches to the 0.6.7 branch as are deemed necessary to ensure flight readiness.

The overall result will be a certification of the SGS as being ready to support flight operations.

3. SIMS System Scenarios

Given that much of SIMS #1 was non-nominal from a system point of view, the system scenarios will remain unchanged from SIMS #1.

3.1. Standard Data Distribution Scenario (repeat of SOVT-2)

3.1.1 MOC <=> HSC Nominal Data scenarios

3.1.1.1 TM Data retrieval from MOC

Here we test the nominal chain of data retrievals whereby we set up the DDS client to start data retrievals.

- Data shall be retrieved every day starting from a specific time onwards.
- Generation of a missing TM report every day after data delivery from the MOC shall be performed and made available on the wiki page.
- Generation of a missing TM report in the DDS manual retrieval format and make it available to the DDS client.
- Generation of a missing TM report and delivery to the DP operators to know what data is missing in each OBSID.

3.1.1.2 Aux data delivery from MOC

Here we test the nominal chain of data reception from the MOC of auxiliary data & making it available to the ICCs, Aux proc and our MPS/PHS

3.1.1.3 TM data ingestion & TM Data Frame generation at HSC

- All TM data received from the MOC shall be ingested into the DB.
- At a specific TBD time every night, the DF generation shall take place for HIFI.

3.1.2. MOC => HSC Failure & recovery scenarios

3.1.2.1 DDS Client recovery after failure

Recovery of the DDS client whereby it falls over during DDS data retrievals

3.1.2.2 DDS Client & PPD approach for xml file reception

Here we test the DDS after the DDS server provides an xml file.

3.1.2.3 Retrieval of missing aux data

Here we retrieve missing aux data that has not yet arrived.

3.1.2.4 Running of the Missing TM ingest & Missing DF software

Where data files come in (after the initial delivery from MOC) then they shall be placed into the DB without duplication taking place.

3.1.3. HSC => ICC Nominal Data Transfer Scenarios

3.1.3.1. Propagation of data to the ICCs

Here we test the nominal DB propagation starting from a clean DB with initial copy being performed before the data arrives i.e. SOVT-2 start scenario.

3.1.3.2 Access to Products in the HSA (Bulk Product Transfer)

Here the ICCs shall retrieve on a daily basis all products that have been newly placed there since the last time they have made their request.

3.1.3.3 Access to updated Mission Planning data on the HSC FTP site

All aux data in use by the MPS shall be placed on the HSC FTP site for ICC to retrieve & use.

3.1.3.3 Information status of data availability on the Wiki Page

Here we will make available on a daily basis to the ICCs on the wiki page.

- The current status of gaps in the DB (as at time of generation of that same file)

- The current pipeline products existing in the DB

- The current aux products existing in the DB

3.1.4. HSC => ICC Data Transfer Failure Scenarios

3.1.4.1 Propagation of data to the ICCs (failure cases)

3.1.4.1.1 Failure Test case #1 - HSC DB failure

Here we test the failure case of our DB falling over and needing to re-establish a consistent DB on both sides of the interface.

3.1.4.1.2 Failure Test case #2 - ICC DB failure

Here we test the failure of the ICC DB falling over and the need to get in sync once more with the HSC DB.

3.1.4.1.3 Failure Test case #3 - HSC DB failure where backup DB is older than ICCs

Here we test the SOVT-2 scenario whereby we needed to get the HSC & ICCs back in sync with the Operations DB.

3.1.4.2 Access to the data via bulk product transfer (failure cases)

Here certain data stated as being available on the HSA will not be there. The ICCs must inform the HSC of which data is not available.

3.1.4.3 Lease Line or Internet Failure scenario

Here we will address the situation whereby data being made available to the ICCs via lease line or internet cannot be provided due to e.g. ICC internet is down.

3.2. Uplink Scenarios

3.2.1. Update of the Mission Configuration & re-planning of an OD

This will be a repeat of all updates made by the ICCs to their back-ends during SOVT-2. We ran through a large number of different scenarios and now we need to repeat them but this time following the procedures to the letter.

Similar to SOVT-2 which requires the ICC to deliver the following different types of updates spread over the ODs that they have previously delivered:

- Update of a single CUS script

- Update of multiple CUS scripts

- Update of a calibration table

- Update of a SSF

- Update of an AOR

Here we need to exercise the interaction procedures of the HSC Uplink Validation Co-ordinator to

(a) iterate with the ICC in question the changes to be delivered;

(b) to inform the MPS of a re-planning that needs to be performed & when;

(c) to receive the delivery & process it with support from the ICS group;

(d) After de-commit by HSC MPS, then run HSpot to set all AORs to released

(e) Co-ordinate with the MPS operators their re-planning of the ODs in question against the new MC or with the new AORs, etc, etc.

All POS files to be sent to MOC shall be reviewed & authorised by the Project Scientist.

3.2.2. Update of the Uplink MIB

- Informing the HSC & MOC of a new MIB update to be made by the ICC, which will impact uplink.
- Delivery of the update to the HSC & on to the MOC.
- MOC to generate a merged HPSDB with the change and redeliver back to the HSC & the ICCs.
- Ops CCB give go-ahead for application of the uplink MIB from a certain OD onwards.
- Planning of that OD takes place with all AORs from then on linked to the new Mission Configuration.

3.2.3 Planning of a ToO

Here the MPS Operators shall be informed of ToO and shall react accordingly.

3.2.4 Planning in advance using a copy of the Operations DB

Planning of ODs well in advance via a copy of the Ops DB and feeding this into the Ops DB shall be exercised.

3.2.5 Anomaly on an instrument and affect on re-planning

The strategy whereby an anomaly takes place on an instrument, how this is informed to the HSC and onto the ICCs, the impact this has on re-planning of further ODs shall be exercised.

3.2.6 Quality Control Reports & feedback to the uplink

All four Quality Control Levels (QCL1 through to QCL4) as described in Section 6.2 of the HSC-ICC Ops interactions document shall be exercised for all observations which reach level 2 in SPG environment.

As a result of this, three observations, one per instrument shall be rescheduled in a later OD based upon the decision from the Quality Control Analyst that their original execution has failed and a repeat is necessary

3.3. Combined Uplink & Downlink Scenarios

3.3.1 Update of the OBSM image & affect on downlink

The delivery of an OBSM image shall be made to the HSC from each ICC with a delivery note as defined in the HSC-ICC interactions document.

The review of this OBSM image from the cCCB and the authorisation of go-ahead to send it to the MOC shall be given. Planning for impact on the downlink shall be addressed with the DP operators.

Sending it to MOC and co-ordination with the MOC and the ICCs with respect to mission planning as to when this will take place and when data will come from the instrument based upon the new instrument.

Provision of the dump data from MOC to HSC and from HSC to ICCs shall be validated.

3.3.2 Update of the SIAM file

Repetition of the steps performed during SOVT-2 whereby a SIAM file becomes applicable from a certain date. Impacts of reprocessing of data from an OD earlier than this date shall be performed.

3.3.3 Manual Commanding Scenarios

3.3.3.1 Preparation with the ICCs of the procedures to be executed during a certain set of ODs

Here the procedures to be run on a particular & the OBSIDs to be used shall be known in advance. This shall include the MOIS import file and the CUS backend to be used against it.

The Timeline Summary Files to be executed shall also be provided by MOC.

3.3.3.2 Reception of data belonging to a certain Manual Commanding period

Data from the MOC belonging to a certain Manual Command period shall be received at HSC & notified to the HCSG i.e. TC History, TSFs finally used,

3.3.3.3 Execution of the Manual Command Uplink Generation procedure

The Community Support Group shall take the information provided in 3.3.3.2 and shall generate for each MOIS procedure the uplink information in the DB using the MC software.

3.3.3.4 The TM arrival from the MC period

The data from the Manual Commanding period shall arrive the following day and shall populate the DB.

3.3.3.5 Execution of pipeline processing

The observations contained in these scenarios shall be sent.

3.4. Downlink Scenarios

3.4.1 Standard pipeline processing of all observations

- Automatic pipeline processing of each OD shall be performed on a daily basis.
- All products generated shall be placed in the HSA for retrieval by bulk product transfer.
- The status/names/versions of all products shall be defined in the Wiki Page.

3.4.2 Validation of the Update to the pipeline s/w

Here the approach to be used + delivery note + cCCB involvement shall be exercised once more between the HSC & the ICCs.

3.4.3 Validation of the delivery of the downlink Calibration products

The approach agreed in the recent System Architects group on how these products are to be delivered shall be exercised. This is possible for SPIRE & PACS but HIFI require an SPR to be implemented before they can do it (so for HIFI this is a SIMS-2 activity).

3.4.4 Update of the Downlink MIB

Changes to the MIB which affect the downlink shall be made with the relevant input to MOC, the co-ordination with the cCCB as to when the Downlink MIB shall be used, the delivery for this downlink MIB, inclusion in the running of the pipelines.

3.4.5 Reprocessing of data from old ODs

Reprocessing of old ODs to regenerate newer product versions shall be exercised.

4. SIMS – Instrument Day to Day Activities – In Detail

4.1 Introduction

The Mission Planning performed at the HSC or by the ICCs, will result in the generation of a Preferred Observation Sequence (POS) File for each Operational Day in question (OD-65 → OD-78 and OD-130 → OD-142).

The planning of each of these Operational Days will be performed, based upon certain input planning rules being followed.

In addition, the detailed timing of observations i.e. second by second, will also be provided. This will allow the reader to know at what time a specific observation type is being executed on board the spacecraft such that e.g. for DP, the pipeline operator will know which pipeline is to be used when the data is downlinked and sent to the HSC.

4.1.1 A detailed breakdown of activities in the Mission Time Line during SIMS

The following breakdown gives detailed timing and other information for activities carried out during SIMS.

4.2 OD-65

Title	Instrument	Mode	Sub-mode	Target name	T secs)
OD65-PARALLEL_SpireEngParallelCoolerRecycleGen-0001	Unknown	Calibration		no pointing	10350
OD65-HIFI_SetIntoPrimary	Unknown	Calibration		(no pointing)	7
OD65-HIFI_Dipl_cal_vs_D2-4	Unknown	Calibration		(no pointing)	2480
OD65-HIFI_Dipl_cal_HotCold-4	Unknown	Calibration		(no pointing)	1537
OD65-HIFI_FPG1-4b-1112GHz	Unknown	Calibration		Fake_Jupiter	9698
OD65-HIFI_FPG2-4b-HalfThrow	Unknown	Calibration		Saturn-1	1354
OD65-HIFI_FPG2-4b-1112GHz	Unknown	Calibration		Saturn-1	1476
OD65-HIFI_FPG2-4b-JupiterMode	Unknown	Calibration		Saturn-1	1825
OD65-HIFI_TuneLO-5b	Unknown	Calibration		(no pointing)	943
OD65-HIFI_Peakup-5b-1200GHz	Unknown	Calibration		Saturn-1	212
OD65HIFI_PUFollowUp-5b-1200GHz	Unknown	Calibration		Saturn-1	72
OD65-HIFI_SetIntoStandby_I	Unknown	Calibration		(no pointing)	11
OD65-HIFI_SetIntoStandby_II	Unknown	Calibration		(no pointing)	25
OD65-PACS_PVPhotSetup_2-PVPhotSetup_na_nStd_orbitpro_na_0001	Unknown	Calibration		None	2272
OD65-PACS_PVPhotFPG_M51_search_map	PACS	PacsPhoto	largeScan	messier 51	4828
OD65-PACS_PVPhotFPG_261C_StdPS_blu_SAA_HIP25412	PACS	PacsPhoto	point	HIP 25412	12899
OD65-PACS_PVPhotFPG_261C_StdPS_blu_SAA_HIP55355	PACS	PacsPhoto	point	HIP 55355	12899
OD65-PACS_PVPhotFPG_262_StdScani45_blu_HIP21479	PACS	PacsPhoto	largeScan	HIP 21479	1199
OD65-PACS_PVPhotFPG_261E_StdScani45_blu_18-Melpomene	PACS	PacsPhoto	largeScan	18 Melpomene	2308
OD65-PACS_PVPhotFPG_261E_StsPS_blu_18-Melpomene	PACS	PacsPhoto	point	18 Melpomene	3370
OD65-PACS_PVPhotSetup_2-PVPhotSetup_na_nStd_orbitepi_na_0001	Unknown	Calibration		None	14
OD65-SPIRE_SpireEngREDYtoPHOT_STBYGen-0000	Unknown	Calibration		pole 2	162
OD65-SPIRE_SpireEngPcalFlashGen-0000	Unknown	Calibration		No pointing	47
OD65-SPIRE_SpirePhoto_CalGCO_FpgInitialPointingGen-0000	Unknown	Calibration		fake beta peg-1	9497
OD65-SPIRE_SpirePhoto_CalGCO_FovMapFpgScanGen-20s-offpos-rel	Unknown	Calibration		fake CRL 2688-1	605
OD65-SPIRE_SpirePhoto_CalGCO_FovMapCrossR-Seren-S06-notDefau	Unknown	Calibration		fake CRL 2688-1-1	2243
OD65-SPIRE_SpireEngPcalFlashGen-0001	Unknown	Calibration		No pointing	47
OD65-SPIRE_FovMapFpgScanGen-offset-abs	Unknown	Calibration		fake CRL 2688x-1-1-1	598
OD65-SPIRE_SpirePhoto_CalGCO_FovMapCrossRasterGen-Seren	Unknown	Calibration		fake gamma dra-x-1-1	1847
OD65-SPIRE_SpirePhoto_CalGCO_FovMapFpgScanGen-30YZ	Unknown	Calibration		fake beta peg-1	1372
OD65-SPIRE_SpireEngPcalFlashGen-0003	Unknown	Calibration		No pointing	47
OD65-SPIRE_SpirePhotoPeakupGen-0000	Unknown	Calibration		gamma dra-1	166
OD65-SPIRE_SpirePhotoPointJiggleGen-6arcsecOffset -flashes	Unknown	Calibration		GAMMA DRA	1652
OD65-SPIRE_SpireEngPHOT_STBYtoREDYGen-0000	Unknown	Calibration		No pointing	36

Schedule for Operation Day 65

Observations

obsid	title	time	proposal
9302	OD65-PARALLEL_SpireEngParallelCoolerRecycleGen-0001	2009-06-15T15:00:00Z	Calibration_mkidge01_1
9292	OD65-PACS_PVPhotSetup_2-PVPhotSetup_na_nStd_orbitpro_na_0001	2009-06-15T17:52:31Z	Calibration_mkidge01_1
9297	OD65-PACS_PVPhotFPG_M51_search_map	2009-06-15T18:39:24Z	Calibration_mkidge01_1
9295	OD65-PACS_PVPhotFPG_261C_StdPS_blu_SAA_HIP55355	2009-06-15T20:15:32Z	Calibration_mkidge01_1
9296	OD65-PACS_PVPhotFPG_262_StdScani45_blu_HIP21479	2009-06-15T23:55:22Z	Calibration_mkidge01_1
9298	OD65-PACS_PVPhotFPG_261E_StdScani45_blu_18-Melpomene	2009-06-16T00:25:51Z	Calibration_mkidge01_1
9299	OD65-PACS_PVPhotFPG_261E_StsPS_blu_18-Melpomene	2009-06-16T01:02:20Z	Calibration_mkidge01_1
9293	OD65-PACS_PVPhotSetup_2-PVPhotSetup_na_nStd_orbitepi_na_0001	2009-06-16T01:55:30Z	Calibration_mkidge01_1
9325	OD65-HIFI_SetIntoPrimary	2009-06-16T01:55:43Z	Calibration_mkidge01_1
9315	OD65-HIFI_Dipl_cal_vs_D2-4	2009-06-16T01:55:49Z	Calibration_mkidge01_1
9316	OD65-HIFI_Dipl_cal_HotCold-4	2009-06-16T02:37:10Z	Calibration_mkidge01_1
9314	OD65-HIFI_FPG1-4b-1112GHz	2009-06-16T03:29:38Z	Calibration_mkidge01_1
9318	OD65-HIFI_FPG2-4b-HalfThrow	2009-06-16T06:12:43Z	Calibration_mkidge01_1
9322	OD65-HIFI_FPG2-4b-1112GHz	2009-06-16T06:36:39Z	Calibration_mkidge01_1
9320	OD65-HIFI_FPG2-4b-JupiterMode	2009-06-16T07:08:51Z	Calibration_mkidge01_1
9317	OD65-HIFI_TuneLO-5b	2009-06-16T07:39:17Z	Calibration_mkidge01_1
9321	OD65-HIFI_Peakup-5b-1200GHz	2009-06-16T07:56:29Z	Calibration_mkidge01_1
9324	OD65HIFI_PUFollowUp-5b-1200GHz	2009-06-16T08:01:54Z	Calibration_mkidge01_1
9323	OD65-HIFI_SetIntoStandby_II	2009-06-16T08:03:07Z	Calibration_mkidge01_1
9319	OD65-HIFI_SetIntoStandby_I	2009-06-16T08:03:31Z	Calibration_mkidge01_1
9311	OD65-SPIRE_SpireEngREDYtoPHOT_STBYGen-0000	2009-06-16T08:03:42Z	Calibration_mkidge01_1
9307	OD65-SPIRE_SpireEngPcalFlashGen-0000	2009-06-16T08:06:25Z	Calibration_mkidge01_1
9304	OD65-SPIRE_SpirePhoto_CalGCO_FovMapFpgScanGen-20s-offpos-rel	2009-06-16T08:11:03Z	Calibration_mkidge01_1
9305	OD65-SPIRE_SpirePhoto_CalGCO_FovMapCrossR-Seren-S06-notDefau	2009-06-16T08:21:39Z	Calibration_mkidge01_1
9308	OD65-SPIRE_SpireEngPcalFlashGen-0001	2009-06-16T08:59:02Z	Calibration_mkidge01_1
9313	OD65-SPIRE_FovMapFpgScanGen-offset-abs	2009-06-16T09:03:24Z	Calibration_mkidge01_1
9312	OD65-SPIRE_SpirePhoto_CalGCO_FovMapCrossRasterGen-Seren	2009-06-16T09:15:28Z	Calibration_mkidge01_1
9303	OD65-SPIRE_SpirePhoto_CalGCO_FovMapFpgScanGen-30YZ	2009-06-16T09:50:04Z	Calibration_mkidge01_1
9309	OD65-SPIRE_SpireEngPcalFlashGen-0003	2009-06-16T10:12:55Z	Calibration_mkidge01_1
9300	OD65-SPIRE_SpirePhotoPeakupGen-0000	2009-06-16T10:15:41Z	Calibration_mkidge01_1
9301	OD65-SPIRE_SpirePhotoPointJiggleGen-6arcsecOffset -flashes	2009-06-16T10:18:39Z	Calibration_mkidge01_1
9306	OD65-SPIRE_SpireEngPHOT_STBYtoREDYGen-0000	2009-06-16T10:46:11Z	Calibration_mkidge01_1
obsid	title	time	proposal

Slews

ra	dec	time	locked
152.84294	19.81570	2009-06-16T11:03:00Z	true
ra	dec	time	locked

4.2 Downlink

Downlink will propagate the SOVT-2 database from OD-60 to OD-64. This is the data that will be processed by the standard pipeline processing.

4.2.1 Explanation of the main Column headings in the upcoming detailed tables

In the following tables the AORs to be performed are listed, by OD, in order of execution, along with basic target, timing and mode information. Jointly with the previous section these tables give a complete picture of the MTL for SOVT-2.

In the tables, the columns are:

“Obs ID” = the Observation Identifier number

"Date (UT)" = time of start of the observation.

“AOR Title” is the name of the AOR contained in the DB that was used by Mission Planning.

“Instrument” is the instrument being used to execute the AOR.

"Mode" corresponds to the observation mode being performed by the instrument starting from the start time in question.

“Target name” is the name of the target to be observed. If “Fake” is added to the name it signifies that the target coordinates have been faked to make the observations more efficient (i.e. less time spent in slews), or to enable a valid reaction wheel biasing to be obtained. If the target name is shown as “no pointing”, it means that an engineering observation will be performed that does not require a target.

"Total time" = total # of seconds required for the observation, including overhead

4.2.2 Operational Day 60

4.2.2.1 OD-60: Planning Rules

DTCP-60 Science activities:

Parallel Cooler Re-cycling in DTCP-60.
HIFI Lasers On in DTCP-60.

OD-60 main Science Activities (21h):

PACS Photometer 3h (14%)
SPParallel 2h (10%)
SPIRE Photometer 5h (24%)
PACS Spectrometer 4h (19%)
HIFI 7h (33%)

DTCP-61 Science activities:

HIFI set into primary in DTCP-61.
HIFI R/T science.

4.2.2.2 OD-60: Schedule in detail

Obs ID	Date (UT)	AOR title	Instrument	Mode	Target name	Total Time (s)
6138	10/06/2009 12:37	Calibration_sovt2_parallel_1-SpireEngParallelCoolerRecycleGen-0000	SPParallel	Engineering	no pointing	10350
6340	10/06/2009 15:29	Calibration_michael_10-SetIntoStandby_II_start-OD60	HIFI	Engineering	(no pointing)	25
6261	10/06/2009 15:29	Calibration_PVPhotSetup_2-PVPhotSetup_na_nStd_orbitpro_na_0001	PACS	Engineering	None	2272
6257	10/06/2009 16:12	Calibration_CPPhotFPG_1-CPPhotFPG_261E_StdPS_blu_SAA_CSDra_0001	PACS	PacsPhoto	Fake-CS Dra	338
6260	10/06/2009 16:17	Calibration_CPPhotFPG_1-CPPhotFPG_261E_StdPS_blu_SAA_HIP56211_0001	PACS	PacsPhoto	Fake-HIP 56211	338
6278	10/06/2009 16:21	Calibration_CPPhotFPG_1-CPPhotFPG_261E_StdPS_blu_SAA_HIP58225_0001	PACS	PacsPhoto	Fake-HIP 58225	338
6264	10/06/2009 16:26	Calibration_CPPhotFPG_1-CPPhotFPG_261E_StdPS_blu_SAA_HIP57504_0001	PACS	PacsPhoto	Fake-HIP 57504	338
6266	10/06/2009 16:30	Calibration_CPPhotFPG_1-CPPhotFPG_261E_StdPS_blu_SAA_HIP67627_0001	PACS	PacsPhoto	Fake-HIP 67627	338
6277	10/06/2009 16:34	Calibration_CPPhotFPG_1-CPPhotFPG_261E_StdPS_blu_SAA_HIP62223_0001	PACS	PacsPhoto	Fake-HIP 62223	338
6256	10/06/2009 16:37	Calibration_CPPhotFPG_1-CPPhotFPG_261E_StdPS_blu_SAA_HIP56779_0001	PACS	PacsPhoto	Fake-HIP 56779	338
6273	10/06/2009 16:43	Calibration_CPPhotFPG_1-CPPhotFPG_261E_StdPS_blu_SAA_HIP65006_0001	PACS	PacsPhoto	Fake-HIP 65006	338
6270	10/06/2009 16:47	Calibration_CPPhotFPG_1-CPPhotFPG_261E_StdPS_blu_SAA_HIP58854_0001	PACS	PacsPhoto	Fake-HIP 58854	338
6263	10/06/2009 16:51	Calibration_CPPhotFPG_1-CPPhotFPG_261E_StdPS_blu_SAA_PPM102025_0001	PACS	PacsPhoto	Fake-PPM 102025	338
6262	10/06/2009 16:56	PVPhotFPG_262B_nStdScani45_blu_gypro_HIP21479	PACS	Engineering	Fake-HIP 21479-1-1	1044
6294	10/06/2009 17:17	SOVT2_ScanMap-2	PACS	PacsPhoto	target1	626
6144	10/06/2009 17:24	Calibration_sovt2_parallel_1-SpireEngREDYtoPHOT_STBYGen-0000	SPParallel	Engineering	no pointing	162

6145	10/06/2009 17:43	Calibration_sovt2_parallel_1-SpirePacsParallelGen-green_slow_orth	SPParallel	Engineering	ngc 6946	3985
6136	10/06/2009 18:57	Calibration_sovt2_parallel_1-PVParAOTVal_515A_StdParallel_blu_fast_betaUMi_nomin	SPParallel	SPParallel	beta ursae minoris	2387
6275	10/06/2009 19:33	Calibration_PVPhotSetup_2-PVPhotSetup_na_nStd_orbitepi_na_0001	PACS	Engineering	None	14
6132	10/06/2009 19:45	Calibration_sovt2_od60_1-SpirePhotoPointJiggleGen-6arcsecOffset	SPIRE	Engineering	1 Ceres	1181
6139	10/06/2009 20:08	Calibration_sovt2_od60_1-SpirePhoto_Cal_StdLoadCurveGen-0000	SPIRE	Engineering	Saturn	1033
6134	10/06/2009 20:27	Calibration_sovt2_od60_1-SPhoto-0001-2Rep	SPIRE	SpirePhoto	new target2	1238
6137	10/06/2009 20:47	Calibration_sovt2_od60_1-SpirePhoto_Cal_IltPcalFlashGen-0000	SPIRE	Engineering	0,90	169
6133	10/06/2009 20:53	Calibration_sovt2_od60_1-SPhoto-0000-4Rep	SPIRE	SpirePhoto	beta pegx-1	1703
6146	10/06/2009 21:18	Calibration_sovt2_od60_1-SpirePhoto_Cal_PhaseUpGen-0000	SPIRE	Engineering	No pointing	338
6135	10/06/2009 21:24	Calibration_sovt2_od60_1-SpirePhoto_Cal_PhaseUpGen-5mV-130Hz	SPIRE	Engineering	No pointing	457
6147	10/06/2009 21:33	Calibration_sovt2_od60_1-SpirePhotoCalGCOFovMapCrossRaster_CRL2688mo_5pts_20	SPIRE	Engineering	CRL 2688 mod-1	580
6151	10/06/2009 21:43	Calibration_sovt2_od60_1-SpireEngPcalFlashGen-0000	SPIRE	Engineering	No pointing	54
6149	10/06/2009 22:06	Calibration_sovt2_od60_1-SpirePhotoPointJiggleGen-flashPerNod3Rep	SPIRE	Engineering	beta peg	1303
6131	10/06/2009 22:50	Calibration_sovt2_od60_1-SPhoto-0002-AB_60x30_Nom	SPIRE	SpirePhoto	CRL 2688	1242
6141	10/06/2009 23:10	Calibration_sovt2_od60_1-SpirePhotoPointJiggleGen-6arcsecOffset	SPIRE	Engineering	GAMMA DRA	1523
6142	10/06/2009 23:36	Calibration_sovt2_od60_1-SpirePhotoPointJiggleGen-6arcsecOffset	SPIRE	Engineering	GAMMA DRA	907
6143	10/06/2009 23:53	Calibration_sovt2_od60_1-SpirePhoto_Cal_PhaseUpGen-70mV-130Hz	SPIRE	Engineering	near 0,90	446
6148	11/06/2009 00:01	Calibration_sovt2_od60_1-SpireEngPHOT_STBYtoREDYGen-0001	SPIRE	Engineering	No pointing	36
6258	11/06/2009 00:01	Calibration_PVSpecSetup_3-PVSpecSetup_na_nStd_orbitpro_na_0001	PACS	Engineering	None	2459
6268	11/06/2009 00:47	Calibration_PVSpecAotVal_1-PVSpecAotVal_521_StdLineChopDither_A_NGC6543_0001	PACS	PacsLineSpec	Fake-NGC6543	1462
6274	11/06/2009 01:10	Calibration_PVSpecAotVal_1-PVSpecAotVal_521_StdLineWaveSwitch_A_NGC6543_0001	PACS	PacsLineSpec	Fake-NGC 6543	1289
6276	11/06/2009 01:30	Calibration_PVSpecAotVal_1-PVSpecAotVal_521_StdLineWaveSwitch_B_NGC6543_0001	PACS	PacsLineSpec	Fake-NGC 6543	1285
6259	11/06/2009 01:51	Calibration_PVSpecAotVal_1-PVSpecAotVal_522_NStd_WS_no_cal_3_NGC7027_0001	PACS	Engineering	Fake-ngc7027	522
6265	11/06/2009 02:01	Calibration_PVSpecAotVal_1-PVSpecAotVal_523_StdRngAFastFullNyq_NGC7027_0001	PACS	PacsRangeSpec	Fake-ngc7027	1987
6269	11/06/2009 02:32	Calibration_PVSpecAotVal_1-PVSpecAotVal_523_StdRngBFastFullNyq_NGC7027_0001	PACS	PacsRangeSpec	Fake-ngc7027	1141
6272	11/06/2009 02:50	Calibration_PVSpecAotVal_1-PVSpecAotVal_523_HighBlueOverlap3rdOrder_NGC7027_1	PACS	PacsRangeSpec	Fake-ngc7027	2358
6267	11/06/2009 03:28	Calibration_PVSpecAotVal_1-PVSpecAotVal_523_HighRedOverlap2ndOrder_NGC7027_1	PACS	PacsRangeSpec	Fake-ngc7027	799
6311	11/06/2009 03:41	PVSpecAotVal_522_NStd_WS_no_cal_8_atOff_FAKE_0001	PACS	Engineering	Fake target #1	1094
6333	11/06/2009 04:01	PVSpecAotVal_522_NStd_WS_no_cal_7_2linesA_FAKE_0001	PACS	Engineering	Fake target #1	1094
6289	11/06/2009 04:20	PVSpecAotVal_522_NStd_WS_no_cal_11_FAKE_0001	PACS	Engineering	Fake target #1	400
6297	11/06/2009 04:28	PVSpecAotVal_522_NStd_WS_no_cal_9_2linesB_FAKE_0001	PACS	Engineering	Fake target #1	342
6304	11/06/2009 04:36	PVSpecAotVal_522_NStd_WS_no_cal_10_FAKE_0001	PACS	Engineering	Fake target #1	342
6303	11/06/2009 04:44	PVSpecFlux_431A_nStdSlewCal_13_DarkField_0001	PACS	Engineering	Fake-HIP 21479-1	133
6306	11/06/2009 04:47	PVSpecFlux_431A_nStdSlewCal_13_DarkField_0002	PACS	Engineering	Fake-HIP 21479-1	133

6271	11/06/2009 04:49	Calibration_PVSpecSetup_3-PVSpecSetup_na_nStd_orbitepi_na_0001	PACS	Engineering	None	14
6120	11/06/2009 04:49	Calibration_michael_10-SetIntoPrimary-OD60	HIFI	Engineering	(no pointing)	7
6125	11/06/2009 04:49	Calibration_michael_10-TuneLO-1b	HIFI	Engineering	(no pointing)	940
6121	11/06/2009 05:08	Calibration_michael_10-OTFFSwitchNoRef-1b	HIFI	HifiMapping	Fake_Gal 79.29+00.46	626
6124	11/06/2009 05:15	Calibration_michael_10-TuneLO-1a	HIFI	Engineering	(no pointing)	940
6127	11/06/2009 05:34	Calibration_michael_10-DBSRasterNoCont-1a	HIFI	HifiMapping	Fake_Uranus	2459
6119	11/06/2009 06:12	Calibration_michael_10-Dipl_cal_vs_D2-4	HIFI	Engineering	(no pointing)	2480
6118	11/06/2009 06:55	Calibration_michael_10-FPG1-4b-1112GHz	HIFI	Engineering	Fake_Jupiter	9698
6126	11/06/2009 09:41	Calibration_michael_10-DBSRasterNoCont-4b	HIFI	HifiMapping	Fake_CarinaN-map-N	3150
6129	11/06/2009 10:30	Calibration_michael_10-TuneLO-2a	HIFI	Engineering	(no pointing)	940
6122	11/06/2009 10:49	Calibration_michael_10-DBSCrossNoCont-2a	HIFI	HifiMapping	Fake_IRC+10216	698
6123	11/06/2009 10:59	Calibration_michael_10-FastDBSCross-2a	HIFI	HifiMapping	Fake_IRC+10216	965
6128	11/06/2009 11:13	Calibration_michael_10-FastDBSRasterNoCont-2a	HIFI	HifiMapping	Fake_IRC+10216	1922
6130	11/06/2009 11:42	Calibration_michael_10-SetIntoStandby_II-OD60	HIFI	Engineering	(no pointing)	25
slew	11/06/2009 12:00	ra="148.95224",dec="24.16846"				

4.2.3 Operational Day 61

4.2.3.1 OD-61: Planning Rules

OD-61 main Science Activities (19h):
HIFI Operations.

DTCP-62 Science activities:
SPIRE Cooler Re-cycling during DTCP-62.
HIFI Lasers On.
SPIRE manual commissioning procedures.

4.2.3.2 OD-61: Schedule in detail

Obs ID	Date (UT)	AOR title	Instrument	Mode	Target name	Total Time (s)
6342	11/06/2009 16:23	HifiEngSetIntoPrimary_RT_Science_OD63	HIFI	Engineering	(no pointing)	7
6343	11/06/2009 16:23	HifiEngSwitchonLO_1a_RT_Science_OD63	HIFI	Engineering	(no pointing)	940
6344	11/06/2009 16:39	HifiEngSetIntoStandby_II_RT_Science_OD63	HIFI	Engineering	(no pointing)	25
6399	11/06/2009 17:00	Calibration_michael_11-SetIntoPrimary-OD63	HIFI	Engineering	(no pointing)	7
6391	11/06/2009 17:00	Calibration_michael_11-IF_FeedBack_Dip-4a	HIFI	Engineering	(no pointing)	3690
6390	11/06/2009 18:01	Calibration_michael_11-Tsys-3a	HIFI	Engineering	(no pointing)	2426
6397	11/06/2009 18:42	Calibration_michael_11-HEB_Spectra_vs_Imix-6b	HIFI	Engineering	(no pointing)	1800
6401	11/06/2009 19:12	Calibration_michael_11-HEB_Spectra_vs_Imix-7a	HIFI	Engineering	(no pointing)	1800
6402	11/06/2009 19:42	Calibration_michael_11-HEB_Spectra_vs_Imix-7b	HIFI	Engineering	(no pointing)	1800
6395	11/06/2009 20:12	Calibration_michael_11-HEB_Spectra_vs_Imix-6a	HIFI	Engineering	(no pointing)	1800
6388	11/06/2009 20:42	Calibration_michael_11-Stab-6a-SYS1	HIFI	Engineering	(no pointing)	1310
6396	11/06/2009 21:22	Calibration_michael_11-SScanFSwitchNoRef-6a	HIFI	HifiFS	Gal 79.29+00.46	9421
6393	11/06/2009 23:57	Calibration_michael_11-SScanFastDBSNoCont-6a	HIFI	HifiFS	Gal 79.29+00.46	13622
6398	12/06/2009 03:41	Calibration_michael_11-TuneLO-3b	HIFI	Engineering	(no pointing)	940
6394	12/06/2009 04:23	Calibration_michael_11-SScanDBSNoCont-3b	HIFI	HifiFS	eta Car	11819
6387	12/06/2009 07:37	Calibration_michael_12-TuneLO-5b	HIFI	Engineering	(no pointing)	943
6392	12/06/2009 07:55	Calibration_michael_11-SScanFSwitchNoRef-5b	HIFI	HifiFS	eta Car	6804
6389	12/06/2009 09:49	Calibration_michael_11-SScanLoadChopNoRef-5b	HIFI	HifiFS	eta Car	5810
6400	12/06/2009 11:25	Calibration_michael_11-SetIntoStandby_II-OD63	HIFI	Engineering	(no pointing)	25
6526	12/06/2009 11:26	Calibration_michael_10-SetIntoStandby_I-OD60	HIFI	Engineering	(no pointing)	11
slew	12/06/2009 12:00	ra="149.75204",dec="23.28865"				

4.2.4 Operational Day 62

4.2.4.1 OD-62: Planning Rules

OD-62 main Science Activities (19h):

SPIRE Photometer 16.5h (87%)
SPIRE Custom map 2.5h (13%)

DTCP-63 Science activities:

PACS set to prime.
PACS cooler recycling.
PACS manual commissioning procedures.

4.2.4.2 OD-62: Schedule in detail

Obs ID	Date (UT)	AOR title	Instrument	Mode	Target name	Total Time (s)
6537	13/06/2009 01:14	Calibration_sovt2_od62_1-SpirePhoto_CalGCO_FovMapFpgScanGen-30YZ	SPIRE	Engineering	No pointing	9072
6540	12/06/2009 12:37	Calibration_sovt2_od62_1-SpireEngCoolerRecycleGen-0000	SPIRE	Engineering	pole 2	162
6541	13/06/2009 04:58	Calibration_sovt2_od62_1-SpirePhotoLargeScanGen-0000	SPIRE	Engineering	No pointing	54
6542	13/06/2009 10:12	Calibration_sovt2_od62_1-SpirePhotoLargeScanGen-0001	SPIRE	Engineering	No pointing	1033
6543	13/06/2009 06:23	Calibration_sovt2_od62_1-SpirePhotoLargeScanGen-0002	SPIRE	Engineering	No pointing	4550
6544	12/06/2009 22:00	Calibration_sovt2_od62_1-SpirePhotoLargeScanGen-0004	SPIRE	Engineering	No pointing	54
6545	12/06/2009 22:51	Calibration_sovt2_od62_1-SpirePhoto_CalGCO_FovMapFpgScanGen-20s-offpos-rel	SPIRE	Engineering	No pointing	54
6546	13/06/2009 07:38	Calibration_sovt2_od62_1-SpirePhotoLargeScanGen-0005	SPIRE	Engineering	1 Ceres	2466
6547	12/06/2009 23:02	Calibration_sovt2_od62_1-SpirePhoto_CalGCO_FovMapCrossR-Seren-S06-notDefau	SPIRE	Engineering	No pointing	54
6548	13/06/2009 08:14	Calibration_sovt2_od62_1-SpirePhotoSmallGen-0000	SPIRE	Engineering	fake beta peg-1	9497
6549	13/06/2009 08:27	Calibration_sovt2_od62_1-SpirePhoto_CalGCO_PhotTransRespoAndDynBeamProfGen-0000	SPIRE	Engineering	No pointing	54
6550	13/06/2009 00:31	Calibration_sovt2_od62_1-SpirePhoto_Cal_BsmAngleCalGen-chop	SPIRE	Engineering	fake new target 2-1	256
6551	12/06/2009 21:49	Calibration_sovt2_od62_1-SpirePhoto_CalGCO_PhotTransRDynBeamP-rate25	SPIRE	Engineering	0, -90-1	2009
6552	13/06/2009 09:59	Calibration_sovt2_od62_1-SpirePhotoSmallGen-0000	SPIRE	SpirePhoto	42355 Typhon-1	601
6553	13/06/2009 10:47	Calibration_sovt2_od62_1-SpireEngPHOT_STBYtoREDYGen-0000	SPIRE	Engineering	No pointing	54
6554	12/06/2009 19:03	Calibration_sovt2_od62_1-SpireEngPcalFlashGen-0000	SPIRE	Engineering	fake CRL 2688-1	605
6555	12/06/2009 16:40	Calibration_sovt2_od62_1-SpireEngPcalFlashGen-0001	SPIRE	Engineering	fake CRL 2688-1-1	2243
6556	12/06/2009 22:39	Calibration_sovt2_od62_1-SPhoto-0001	SPIRE	Engineering	No pointing	54
6557	12/06/2009 18:16	Calibration_sovt2_od62_1-SpireEngPcalFlashGen-0002	SPIRE	Engineering	fake CRL 2688x-1-1-1	598
6558	13/06/2009 05:42	Calibration_sovt2_od62_1-SPhoto-0002	SPIRE	Engineering	fake gamma dra-x-1-1	1847
6559	12/06/2009	Calibration_sovt2_od62_1-SpireEngPcalFlashGen-0003	SPIRE	Engineering	fake beta peg-1	2596

	21:46					
6560	13/06/2009 09:41	Calibration_sovt2_od62_1-SPhoto-0003	SPIRE	Engineering	fake beta peg-1	1372
6561	12/06/2009 18:15	Calibration_sovt2_od62_1-SpireEngPcalFlashGen-0004	SPIRE	Engineering	fake beta peg-1	2596
6562	13/06/2009 08:38	Calibration_sovt2_od62_1-SPhoto-0004	SPIRE	Engineering	No pointing	36
6563	12/06/2009 22:46	Calibration_sovt2_od62_1-SpireEngPcalFlashGen-0005	SPIRE	Engineering	No pointing	9072
6564	12/06/2009 23:39	Calibration_sovt2_od62_1-SpireEngPcalFlashGen-0006	SPIRE	Engineering	pole 2	162
6565	12/06/2009 18:22	Calibration_sovt2_od62_1-SpirePhoto_Cal_PcalLoadCurveGen-0000	SPIRE	Engineering	fake CRL 2688x-1-1	2495
6566	13/06/2009 05:55	Calibration_sovt2_od62_1-SpirePhoto_Cal_StdLoadCurveGen-0003	SPIRE	SpirePhoto	fake gamma drax2-1-1	547
6567	12/06/2009 19:08	Calibration_sovt2_od62_1-SpirePhoto_CalGCO_FpgInitialPointingGen-0000	SPIRE	Engineering	new target 5	1022
6568	13/06/2009 10:05	Calibration_sovt2_od62_1-SpirePhoto_Cal_IltPcalFlashGen-0000	SPIRE	Engineering	0,90	3355
6569	13/06/2009 08:35	Calibration_sovt2_od62_1-SpirePhoto_Cal_IltPcalFlashGen-0001	SPIRE	Engineering	pole 2	1022
6570	12/06/2009 16:37	Calibration_sovt2_od62_1-SpireEngREDYtoPHOT_STBYGen-0000	SPIRE	Engineering	0,90	1681
6571	12/06/2009 23:56	Calibration_sovt2_od62_1-SpirePhoto_CalGCO_FovMapCrossRasterGen-Seren	SPIRE	Engineering	fake beta pegx-1-1-1	299
6572	12/06/2009 16:41	Calibration_sovt2_od62_1-SpirePhoto_Cal_StdLoadCurveGen-0000	SPIRE	Engineering	fake new target 4-1-1	238
6573	13/06/2009 07:20	Calibration_sovt2_od62_1-SpirePhoto_Cal_StdLoadCurveGen-0001	SPIRE	Engineering	Saturn-1	176
6574	13/06/2009 01:37	Calibration_sovt2_od62_1-SpirePhoto_Cal_BsmAngleCalGen-jiggle	SPIRE	SpirePhoto	Saturn-1	3870
6575	12/06/2009 23:44	Calibration_sovt2_od62_1-SpirePhoto_CalGCO_FovMapFpgScanGen-offset-abs	SPIRE	SpirePhoto	42355 Typhon-1	1249
6576	12/06/2009 17:00	Calibration_sovt2_od62_1-SpirePhoto_Cal_MultiLevelNoiseGen-100Hz	SPIRE	Engineering	42355 Typhon-1	310
6577	13/06/2009 02:21	Calibration_sovt2_od62_1-SpireEngCoolerRecycleGen-0000	SPIRE	Engineering	42355 Typhon-1	176
6578	13/06/2009 02:20	Calibration_sovt2_od62_1-SpireEngPHOT_STBYtoREDYGen-0000	SPIRE	Engineering	1 Ceres	2135
6579	13/06/2009 04:52	Calibration_sovt2_od62_1-SpireEngREDYtoPHOT_STBYGen-0000	SPIRE	Engineering	No pointing	36

4.2.5 Operational Day 63

4.2.5.1 OD-63: Planning Rules

OD-63 main Science Activities (19h):

PACS operations.
Burst mode TM.

DTCP-64 Science activities:

PACS/SPIRE parallel cooler recycling.

4.2.5.2 OD-63: Schedule in detail

Obs ID	Date (UT)	AOR title	Instrument	Mode	Target name	Total Time (s)
6684	13/06/2009 14:37	Calibration_michael_10-SetIntoStandby_II_start-OD62	HIFI	Engineering	(no pointing)	25
6587	13/06/2009 14:37	Calibration_PVSpecSetup_3-PVSpecSetup_na_nStd_coldCS_na_0001	PACS	Engineering	None	356
6590	13/06/2009 14:43	Calibration_PVSpecFlux_2-PVSpecFlux_4310D_nStdDarkCSSimultWarmUp_eng_na_0001	PACS	Engineering	Fake-ISOPHOT Dark Field	11124
6620	13/06/2009 17:48	Calibration_PVSpecSetup_3-PVSpecSetup_na_nStd_orbitepi_na_0002	PACS	Engineering	None	14
6609	13/06/2009 17:48	Calibration_PVPhotCooler_1-PVPhotCooler_117_nStd_na_na_0001	PACS	Engineering	None	9133
6594	13/06/2009 20:21	Calibration_PVPhotSetup_2-PVPhotSetup_na_nStd_orbitpro_na_0002	PACS	Engineering	None	2272
6610	13/06/2009 21:04	Calibration_PVPhotSpatial_1-PVPhotSpatial_314A_NStd_bluM1_AlfBoo_0001	PACS	Engineering	Fake-* alf boo	500
6598	13/06/2009 21:12	Calibration_PVPhotBol_1-PVPhotBol_110A_nStd_VrlVhBlind_na_0001	PACS	Engineering	None	2826
6630	13/06/2009 22:06	Calibration_CPPhotBol_1-CPPhotBol_721A_nStd_firstBackGrd_DarkField_0001	PACS	Engineering	Fake-North empty region	3053
6591	13/06/2009 22:58	Calibration_PVPhotAOTVal_2-PVPhotAOTVal_512G_nStdSmall_30s_NGC6543_0001	PACS	Engineering	Fake-NGC 6543	896
6586	13/06/2009 23:14	Calibration_PVPhotAOTVal_2-PVPhotAOTVal_512G_nStdSmall_60s_NGC6543_0001	PACS	Engineering	Fake-NGC 6543	803
6589	13/06/2009 23:28	Calibration_PVPhotSpatial_1-PVPhotSpatial_313A_StdScan_bluPA90_V814Her_0001	PACS	PacsPhoto	Fake-V814 Her	2707
6618	14/06/2009 00:12	Calibration_PVPhotSpatial_1-PVPhotSpatial_313A_StdScan_bluPA0_V814Her_0001	PACS	PacsPhoto	Fake-V814 Her	5166
6626	14/06/2009 01:37	Calibration_PVPhotAOTVal_2-PVPhotAOTVal_511H_nStdCalB_16rds_hr7001_003	PACS	Engineering	Fake-hr7001	133
6603	14/06/2009 01:39	Calibration_PVPhotAOTVal_2-PVPhotAOTVal_511H_nStdCalB_20rds_hr7001_001	PACS	Engineering	Fake-hr7001	133
6600	14/06/2009 01:42	Calibration_PVPhotAOTVal_2-PVPhotAOTVal_511H_nStdCalB_8rds_hr7001_002	PACS	Engineering	Fake-hr7001	133
6605	14/06/2009 01:44	Calibration_PVPhotAOTVal_2-PVPhotAOTVal_511H_nStdCalB_20rds_hr7001_003	PACS	Engineering	Fake-hr7001	133
6624	14/06/2009 01:46	Calibration_PVPhotAOTVal_2-PVPhotAOTVal_511H_nStdCalB_16rds_hr7001_001	PACS	Engineering	Fake-hr7001	133
6625	14/06/2009 01:48	Calibration_PVPhotAOTVal_2-PVPhotAOTVal_511H_nStdCalB_16rds_hr7001_002	PACS	Engineering	Fake-hr7001	133
6604	14/06/2009 01:51	Calibration_PVPhotAOTVal_2-PVPhotAOTVal_511H_nStdCalB_20rds_hr7001_002	PACS	Engineering	Fake-hr7001	133
6602	14/06/2009 01:53	Calibration_PVPhotAOTVal_2-PVPhotAOTVal_511H_nStdCalB_8rds_hr7001_003	PACS	Engineering	Fake-hr7001	133
6599	14/06/2009 01:55	Calibration_PVPhotAOTVal_2-PVPhotAOTVal_511H_nStdCalB_8rds_hr7001_001	PACS	Engineering	Fake-hr7001	133
6617	14/06/2009 01:58	Calibration_PVPhotAOTVal_2-PVPhotAOTVal_511H_nStdCalB_12rds_hr7001_002	PACS	Engineering	Fake-hr7001	133
6619	14/06/2009 02:00	Calibration_PVPhotAOTVal_2-PVPhotAOTVal_511H_nStdCalB_12rds_hr7001_003	PACS	Engineering	Fake-hr7001	133
6616	14/06/2009 02:02	Calibration_PVPhotAOTVal_2-PVPhotAOTVal_511H_nStdCalB_12rds_hr7001_001	PACS	Engineering	Fake-hr7001	133

6608	14/06/2009 02:07	Calibration_PVPhotAOTVal_2-PVPhotAOTVal_511G_nStdPS_intcal10_blu_HD15008_0001	PACS	Engineering	Fake-HD 15008	1958
6614	14/06/2009 02:40	Calibration_PVPhotAOTVal_2-PVPhotAOTVal_511G_nStdPS_intcal0_grn_HD15008_0001	PACS	Engineering	Fake-HD 15008	1591
6596	14/06/2009 03:10	Calibration_PVPhotSpatial_1-PVPhotSpatial_312A_NStd_blu_Kbin14_0001	PACS	Engineering	Fake-K-band_binary_14	310
6601	14/06/2009 03:16	Calibration_PVPhotSpatial_1-PVPhotSpatial_312B_NStd_blu_Kbin14_0001	PACS	Engineering	Fake-K-band_binary_14	299
6622	14/06/2009 03:25	Calibration_PVPhotBol_1-PVPhotBol_111bisA_nStdRaster_grnInitDrct_Ceres_0001	PACS	Engineering	1 Ceres	11
6595	14/06/2009 03:28	Calibration_PVPhotBol_1-PVPhotBol_111bisA_nStdRaster_grn26Drct_Ceres_0001	PACS	Engineering	1 Ceres	5328
6611	14/06/2009 05:00	Calibration_PVPhotBol_1-PVPhotBol_111bisA_nStdRaster_FinDrct_Ceres_0001	PACS	Engineering	1 Ceres	11
6597	14/06/2009 05:02	Calibration_PVPhotFlux_1-PVPhotFlux_324A_StdPS_hi200Jy_grn_1Ceres_0001	PACS	PacsPhoto	1 Ceres	349
6649	14/06/2009 05:08	SOVT2_ScanMap-7	PACS	PacsPhoto	target3	2765
6650	14/06/2009 05:53	SOVT2_ScanMap-8	PACS	PacsPhoto	target3	1753
6631	14/06/2009 06:19	Calibration_PVPhotSetup_2-PVPhotSetup_na_nStd_orbitepi_na_0002	PACS	Engineering	None	14
6588	14/06/2009 06:19	Calibration_PVSpecSetup_3-PVSpecSetup_na_nStd_orbitpro_short_0001	PACS	Engineering	None	1256
6623	14/06/2009 06:43	Calibration_PVSpecWave_2-PVSpecWave_421A_nStdRS_nochoporderA_Jupiter_0002	PACS	Engineering	Fake-Jupiter Barycenter-Saturn	706
6627	14/06/2009 06:55	Calibration_PVSpecWave_2-PVSpecWave_421A_nStdRS_nochoporderB_Jupiter_0003	PACS	Engineering	Fake-Jupiter Barycenter-Saturn	1015
6628	14/06/2009 07:13	Calibration_PVSpecWave_2-PVSpecWave_421A_nStdRS_nochoporderB_Jupiter_0004	PACS	Engineering	Fake-Jupiter Barycenter-Saturn	428
6606	14/06/2009 07:24	Calibration_PVSpecFlux_2-PVSpecFlux_4310B_nStdFovScan_60-2_DarkField_0001	PACS	Engineering	Fake-ISOPHOT Dark Field	392
6615	14/06/2009 07:31	Calibration_PVSpecFlux_2-PVSpecFlux_4310B_nStdFovScan_60-3_DarkField_0001	PACS	Engineering	Fake-ISOPHOT Dark Field	392
6607	14/06/2009 07:40	Calibration_PVSpecSpatial_3-PVSpecSpatial_411_nStd_9x9RC_00_w75_IRAS22134_0001	PACS	Engineering	Fake-IRAS22134+5834	2171
6612	14/06/2009 08:18	Calibration_PVSpecSpatial_3-PVSpecSpatial_412_nStd_ScaCh45d_00_IRAS22134_0001	PACS	Engineering	Fake-IRAS22134+5834	2930
6592	14/06/2009 09:08	Calibration_PVSpecSpatial_3-PVSpecSpatial_412_nStd_ScaCh135d_00_IRAS22134_0001	PACS	Engineering	Fake-IRAS22134+5834	2930
6629	14/06/2009 09:57	Calibration_CPMechChop_1-CPMechChop_232A_nStd_PidFinetuningShort_na_0002	PACS	Engineering	none	1566
6593	14/06/2009 10:23	Calibration_CPSpecGeGa_1-CPSpecGeGa_na_nStdCuringExplore_SOVT2_na_0001	PACS	Engineering	Fake-ISOPHOT Dark Field	1199
6585	14/06/2009 10:43	Calibration_CPSpecGeGa_1-CPSpecGeGa_na_nStdRespMonitorLoop_SOVT2_na_0001	PACS	Engineering	Fake-ISOPHOT Dark Field	1843
6613	14/06/2009 11:14	Calibration_CPSpecGeGa_1-CPSpecGeGa_na_nStdBufferTransmission_SOVT2_na_0001	PACS	Engineering	Fake-ISOPHOT Dark Field	760
6642	14/06/2009 11:30	PVSpecFlux_431A_nStdSlewCal_20_DarkField_0002	PACS	Engineering	Fake-HIP 21479-1	76
6643	14/06/2009 11:32	PVSpecFlux_431A_nStdSlewCal_20_DarkField_0003	PACS	Engineering	Fake-NGC 6543	76
6655	14/06/2009 11:33	PVSpecFlux_431A_nStdSlewCal_17_DarkField_0003	PACS	Engineering	Fake-NGC6543	94
6661	14/06/2009 11:35	PVSpecFlux_431A_nStdSlewCal_18_DarkField_0002	PACS	Engineering	Fake-NGC6543	72
6660	14/06/2009 11:36	PVSpecFlux_431A_nStdSlewCal_14_DarkField_0003	PACS	Engineering	Fake-NGC 6543	94
6662	14/06/2009 11:38	PVSpecFlux_431A_nStdSlewCal_18_DarkField_0003	PACS	Engineering	Fake-NGC 6543	72
6664	14/06/2009 11:39	PVSpecFlux_431A_nStdSlewCal_21_DarkField_0002	PACS	Engineering	Fake-NGC6543	97
6668	14/06/2009 11:41	PVSpecFlux_431A_nStdSlewCal_15_DarkField_0001	PACS	Engineering	Fake-NGC6543	173
6670	14/06/2009 11:44	PVSpecFlux_431A_nStdSlewCal_15_DarkField_0002	PACS	Engineering	Fake-NGC 6543	173
6674	14/06/2009 11:48	PVSpecFlux_431A_nStdSlewCal_19_DarkField_0003	PACS	Engineering	Fake-CS Dra	94

6663	14/06/2009 11:50	PVSpecFlux_431A_nStdSlewCal_21_DarkField_0001	PACS	Engineering	Fake-CS Dra	97
6665	14/06/2009 11:52	PVSpecFlux_431A_nStdSlewCal_21_DarkField_0003	PACS	Engineering	Fake-CS Dra	97
6621	14/06/2009 11:53	Calibration_PVSpecSetup_3-PVSpecSetup_na_nStd_orbitepi_na_0003	PACS	Engineering	None	14
slew	14/06/2009 12:00	ra="151.32824",dec="21.53446"				

4.2.6 Operational Day 64

4.2.6.1 OD-64: Planning Rules

OD-64 main Science Activities (21h):

HIFI 7h (33%)
PACS Photometer 5h (24%)
SPParallel 2h (10%)
SPIRE Photometer 5h (24%)
PACS Spectrometer 2h (10%)

DTCP-65 Science activities:

None.

4.2.6.2 OD-64: Schedule in detail

Obs ID	Date (UT)	AOR title	Instrument	Mode	Target name	Total Time (s)
6735	14/06/2009 13:41	Calibration_michael_12-SetIntoPrimary-OD64	HIFI	Engineering	(no pointing)	7
6736	14/06/2009 13:41	Calibration_michael_12-TuneLO-1b	HIFI	Engineering	(no pointing)	940
6721	14/06/2009 13:59	Calibration_michael_12-OTFFSwitchNoRef-1b	HIFI	HifiMapping	Fake_Gal 79.29+00.46-1	626
6737	14/06/2009 14:08	Calibration_michael_12-OTF-1b	HIFI	HifiMapping	Fake_Gal 79.29+00.46-1	562
6723	14/06/2009 14:16	Calibration_michael_12-OTFLoadChopNoRef-1b	HIFI	HifiMapping	Fake_Gal 79.29+00.46-1	626
6733	14/06/2009 14:25	Calibration_michael_12-OTFFSwitch-1b	HIFI	HifiMapping	Fake_Gal 79.29+00.46-1	731
6720	14/06/2009 14:34	Calibration_michael_12-Dipl_cal_HotCold-4	HIFI	Engineering	(no pointing)	1537
6730	14/06/2009 15:04	Calibration_michael_12-FPG2-4b-1112GHz	HIFI	Engineering	Saturn-1	1476
6727	14/06/2009 15:36	Calibration_michael_12-FPG2-4b-JupiterMode	HIFI	Engineering	Saturn-1	1825
6725	14/06/2009 16:08	Calibration_michael_12-FPG2-4b-HalfThrow	HIFI	Engineering	Saturn-1	1354
6729	14/06/2009 16:34	Calibration_michael_12-Stability-4b-1091GHz	HIFI	Engineering	fake blank sky	2617
6731	14/06/2009 17:18	Calibration_michael_12-TuneLO-7b	HIFI	Engineering	(no pointing)	965
6724	14/06/2009 17:36	Calibration_michael_12-DBSRasterNoCont-7b	HIFI	HifiMapping	Fake CarinaS-point-IF	3542
6722	14/06/2009 18:33	Calibration_michael_11-TuneLO-5b	HIFI	Engineering	(no pointing)	943
6728	14/06/2009 18:52	Calibration_michael_12-Peakup-5b-1200GHz	HIFI	Engineering	Saturn-1	212
6734	14/06/2009 18:58	Calibration_michael_12-PUFollowUp-5b-1200GHz	HIFI	Engineering	Saturn-1	72
6732	14/06/2009 18:59	Calibration_michael_12-SetIntoStandby_II-OD64	HIFI	Engineering	(no pointing)	25
6726	14/06/2009 18:59	Calibration_michael_12-SetIntoStandby_I-OD64	HIFI	Engineering	(no pointing)	11
6701	14/06/2009 19:29	Calibration_sovt2_parallel_1-SpireEngParallelCoolerRecycleGen-0001	SPParallel	Engineering	no pointing	10350
6752	14/06/2009 22:22	Calibration_PVPhotSetup_2-PVPhotSetup_na_nStd_orbitpro_na_0003	PACS	Engineering	None	2272
6745	14/06/2009 23:04	Calibration_CPPhotFPG_1-CPPhotFPG_261E_StdPS_blu_SAA_CSDra_0002	PACS	PacsPhoto	Fake-CS Dra	338

6772	14/06/2009 23:09	Calibration_CPPhotFPG_1-CPPhotFPG_261E_StdPS_blu_SAA_HIP58225_0002	PACS	PacsPhoto	Fake-HIP 58225	338
6759	14/06/2009 23:13	Calibration_CPPhotFPG_1-CPPhotFPG_261E_StdPS_blu_SAA_HIP67627_0002	PACS	PacsPhoto	Fake-HIP 67627	338
6769	14/06/2009 23:18	Calibration_CPPhotFPG_1-CPPhotFPG_261E_StdPS_blu_SAA_HIP62223_0002	PACS	PacsPhoto	Fake-HIP 62223	338
6762	14/06/2009 23:23	Calibration_CPPhotFPG_1-CPPhotFPG_261E_StdPS_blu_SAA_HIP65006_0002	PACS	PacsPhoto	Fake-HIP 65006	338
6754	14/06/2009 23:28	Calibration_CPPhotFPG_1-CPPhotFPG_261E_StdPS_blu_SAA_PPM102025_0002	PACS	PacsPhoto	Fake-PPM 102025	338
6771	14/06/2009 23:33	Calibration_CPPhotFPG_1-CPPhotFPG_262A_nStdRaster_blu_gypro_HIP21479_0001	PACS	Engineering	fake HIP 21479-1	4828
6703	15/06/2009 00:54	Calibration_sovt2_od64_1-SpireEngREDYtoPHOT_STBYGen-0000	SPIRE	Engineering	No pointing	162
6705	15/06/2009 01:08	Calibration_sovt2_parallel_1-PVParAOTVal_515A_StdParallel_green_fast_betaUMi_nom	SPParallel	SPParallel	beta ursae minoris	2387
6697	15/06/2009 01:51	Calibration_sovt2_parallel_1-PVParAOTVal_515B_StdParallel_blu_slow_ngc6946_ortho	SPParallel	SPParallel	ngc 6946-1	4165
6768	15/06/2009 02:58	Calibration_PVPhotSetup_2-PVPhotSetup_na_nStd_orbitepi_na_0003	PACS	Engineering	None	14
6706	15/06/2009 03:06	Calibration_sovt2_od64_1-SpirePhotoPointJiggleGen-6arcsecOffset	SPIRE	Engineering	1 Ceres	1181
6694	15/06/2009 03:29	Calibration_sovt2_od64_1-SpirePhoto_Cal_IltPcalFlashGen-0000	SPIRE	Engineering	0,90	169
6691	15/06/2009 03:35	Calibration_sovt2_od64_1-SpirePhoto_Cal_PhaseUpGen-70mV-130Hz	SPIRE	Engineering	near 0, 90-1	446
6693	15/06/2009 03:50	Calibration_sovt2_od64_1-SpirePhotoPointJiggleGen-flashPerNod3Rep	SPIRE	Engineering	beta peg-2	1303
6700	15/06/2009 04:12	Calibration_sovt2_od64_1-SpireEngPcalFlashGen-0000	SPIRE	Engineering	No pointing	54
6707	15/06/2009 04:13	Calibration_sovt2_od64_1-SpirePhoto_Cal_PhaseUpGen-5mV-130Hz	SPIRE	Engineering	No pointing	457
6696	15/06/2009 04:30	Calibration_sovt2_od64_1-SpirePhoto_Cal_StdLoadCurveGen-0000	SPIRE	Engineering	Saturn	1033
6692	15/06/2009 04:49	Calibration_sovt2_od64_1-SPhoto-0001-2Rep	SPIRE	SpirePhoto	new target 2-1	1238
6690	15/06/2009 05:30	Calibration_sovt2_od64_1-SPhoto-0000-4Rep	SPIRE	SpirePhoto	beta peg	1703
6695	15/06/2009 06:11	Calibration_sovt2_od64_1-SpirePhoto_Cal_MultiLevelNoiseGen-0000	SPIRE	Engineering	CRL 2688-1	1746
6709	15/06/2009 06:49	Calibration_sovt2_od64_1-SPhoto-0002-AB_60x30_Nom	SPIRE	SpirePhoto	CRL 2688-1	2876
6698	15/06/2009 07:36	Calibration_sovt2_od64_1-SpirePhotoPeakupGen-0000	SPIRE	Engineering	gamma dra-1	166
6699	15/06/2009 07:39	Calibration_sovt2_od64_1-SpirePhotoPointJiggleGen-6arcsecOffset	SPIRE	Engineering	GAMMA DRA	1699
6708	15/06/2009 08:08	Calibration_sovt2_od64_1-SpireEngPHOT_STBYtoREDYGen-0000	SPIRE	Engineering	No pointing	36
6747	15/06/2009 08:08	Calibration_PVSpecSetup_3-PVSpecSetup_na_nStd_orbitpro_na_0002	PACS	Engineering	None	2459
6767	15/06/2009 08:53	Calibration_PVSpecAotVal_1-PVSpecAotVal_522_NStd_WS_no_cal_1_NGC7027_0001	PACS	Engineering	fake ngc7027	400
6773	15/06/2009 09:02	Calibration_PVSpecAotVal_1-PVSpecAotVal_522_NStd_WS_no_cal_2_NGC7027_0001	PACS	Engineering	fake ngc7027	400
6748	15/06/2009 09:10	Calibration_PVSpecAotVal_1-PVSpecAotVal_522_NStd_WS_no_cal_3_NGC7027_0002	PACS	Engineering	fake ngc7027	522
6763	15/06/2009 09:21	Calibration_PVSpecFlux_2-PVSpecFlux_438A_nStdSlewCal_A_DarkField_0001	PACS	Engineering	Fake ISOPHOT Dark Field	130
6744	15/06/2009 09:23	Calibration_PVSpecFlux_2-PVSpecFlux_438A_nStdSlewCal_B_DarkField_0001	PACS	Engineering	Fake ISOPHOT Dark Field	126
6758	15/06/2009 09:25	Calibration_PVSpecFlux_2-PVSpecFlux_438A_nStdQuickFull_CS1_DarkField_0001	PACS	Engineering	Fake ISOPHOT Dark Field	3474
6764	15/06/2009 10:23	Calibration_PVSpecFlux_2-PVSpecFlux_438A_nStdSlewCal_A_DarkField_0002	PACS	Engineering	Fake ISOPHOT Dark Field	130
6746	15/06/2009	Calibration_PVSpecFlux_2-	PACS	Engineering	Fake	126

	10:26	PVSpecFlux_438A_nStdSlewCal_B_DarkField_0002			ISOPHOT Dark Field	
6770	15/06/2009 10:28	Calibration_PVSpecFlux_2-PVSpecFlux_438A_nStdQuickFull_CS2_DarkField_0001	PACS	Engineering	Fake ISOPHOT Dark Field	3474
6755	15/06/2009 11:26	Calibration_PVSpecFlux_2-PVSpecFlux_431A_nStdSlewCal_01_DarkField_0001	PACS	Engineering	Fake ISOPHOT Dark Field	94
6765	15/06/2009 11:28	Calibration_PVSpecFlux_2-PVSpecFlux_431A_nStdSlewCal_02_DarkField_0001	PACS	Engineering	Fake ISOPHOT Dark Field	112
6749	15/06/2009 11:30	Calibration_PVSpecFlux_2-PVSpecFlux_431A_nStdSlewCal_03_DarkField_0001	PACS	Engineering	Fake ISOPHOT Dark Field	126
6751	15/06/2009 11:32	Calibration_PVSpecFlux_2-PVSpecFlux_431A_nStdSlewCal_04_DarkField_0001	PACS	Engineering	Fake ISOPHOT Dark Field	72
6756	15/06/2009 11:33	Calibration_PVSpecFlux_2-PVSpecFlux_431A_nStdSlewCal_05_DarkField_0001	PACS	Engineering	Fake ISOPHOT Dark Field	79
6766	15/06/2009 11:34	Calibration_PVSpecFlux_2-PVSpecFlux_431A_nStdSlewCal_06_DarkField_0001	PACS	Engineering	Fake ISOPHOT Dark Field	90
6750	15/06/2009 11:36	Calibration_PVSpecFlux_2-PVSpecFlux_431A_nStdSlewCal_07_DarkField_0001	PACS	Engineering	Fake ISOPHOT Dark Field	126
6753	15/06/2009 11:38	Calibration_PVSpecFlux_2-PVSpecFlux_431A_nStdSlewCal_08_DarkField_0001	PACS	Engineering	Fake ISOPHOT Dark Field	90
6757	15/06/2009 11:40	Calibration_PVSpecFlux_2-PVSpecFlux_431A_nStdSlewCal_09_DarkField_0001	PACS	Engineering	Fake ISOPHOT Dark Field	158
6761	15/06/2009 11:42	Calibration_PVSpecFlux_2-PVSpecFlux_431A_nStdSlewCal_10_DarkField_0001	PACS	Engineering	Fake ISOPHOT Dark Field	104
6760	15/06/2009 11:44	Calibration_PVSpecSetup_3-PVSpecSetup_na_nStd_orbitepi_na_0004	PACS	Engineering	None	14
slew	15/06/2009 12:00	ra="152.10463",dec="20.65805"				

5. SIMS – Ground Segment Day to Day Activities – In Detail

5.1 Introduction & general overview of ground segment activities

This chapter defines the steps to be performed on a day to day basis at each Operational Centre involved in the test.

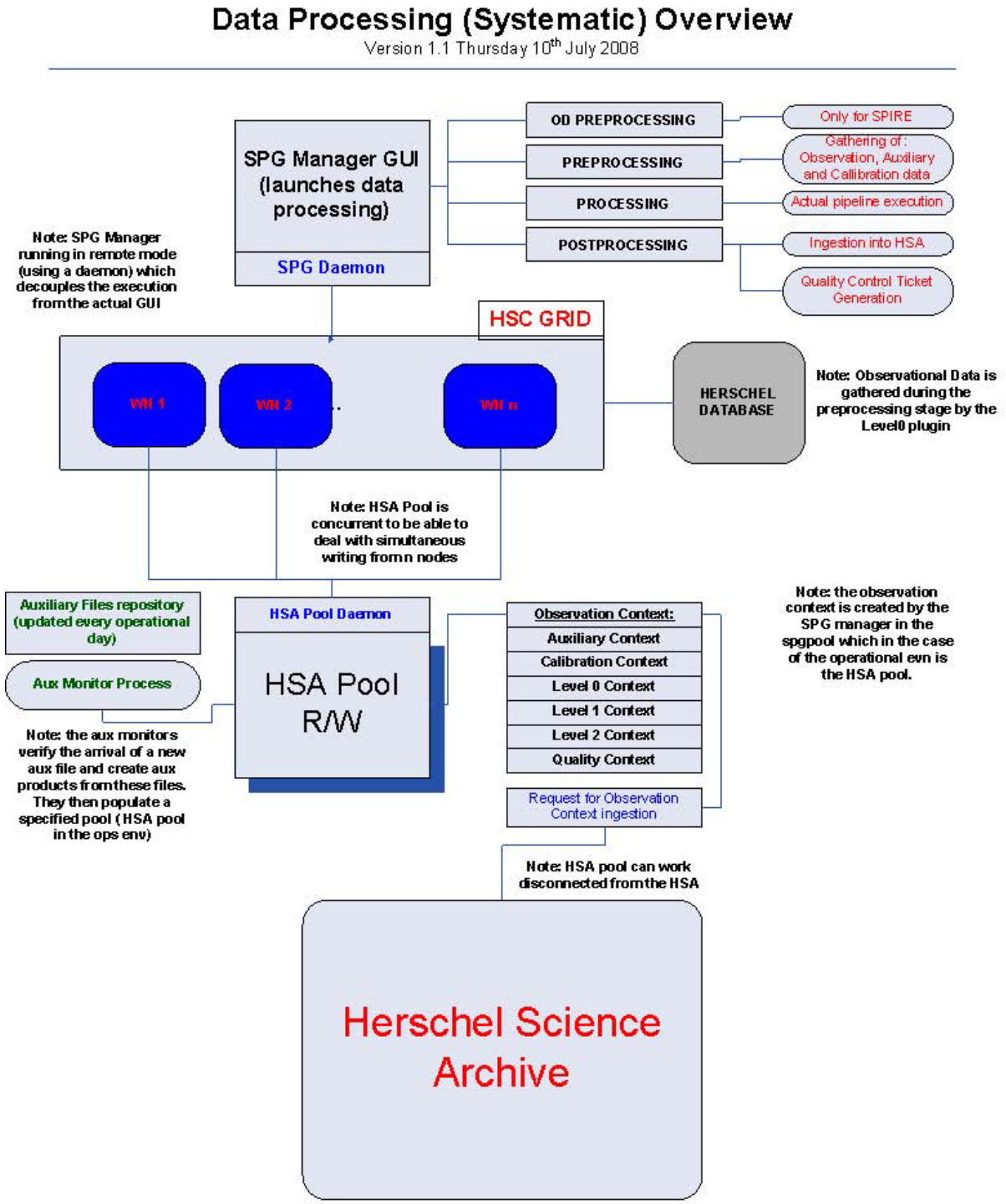
5.2 Science Ground Segment data flow

For the first week of SIMS #2 the DTCP will be set at 12:00z and a script will be run to populate the database at the HSC with SOVT-2 data at the same rate that it would be received from MOC in normal operations. For the second week of SIMS #2 the DTCP will be moved to its nominal time for PV Phase. The data will be propagated to the ICCs through the DDS and, on receipt of the completion flag, TMingest and pipeline processing will be run automatically.

5.3 DP Flow

5.3.1 Overview of DP

The flow chart below summarises the data flow through the Data Processing (DP) system, through to the final dump in the Herschel Mission Archive.



5.3.2 Automatic pipeline processing

The automated pipeline processing will start after the last data packet has been received at ESAC during the night and will complete running before HSC personnel arrive the following morning.

The pipeline parameters are configurable. This is required because the time of arrival of the last data packet will vary from day-to-day according to the instrument and observing mode that is in operation and thus the

quantity of data to be transferred. Thus the process will be launched at 00:00UT and will check for completion of data transfer at half hour intervals until it detects that the transfer is complete and that all the necessary data and products are available.

The sequence of pipeline processing events is the following:

1. Check that a given required file (set by the Configuration property: "hcss.ia.spg.cron.ddsfile") exists on the file system.

2. This file contains a start/end time of the data retrieved for that operational day, for example:

```
#Thu Jul 17 21:30:08 MEST 2008
startTime=2008-10-28T13\:27\:28.000000 TAI (1603891648000000)
endTime=2008-10-29T13\:30\:26.000000 TAI (1603978226000000)
```

3. Retrieve the Operational Day corresponding to this start/end times from the Versant database.

4. Get the scheduled observations listed under that Operational Day

5. Check that the following products from the AUX process have been created for that Operational Day:

```
herschel.ia.obs.auxiliary.pointing.PointingProduct
herschel.ia.obs.auxiliary.ool.OolProduct
herschel.ia.obs.auxiliary.timecorr.TimeCorrProduct
```

This file list is configurable. The Pointing Product file should be the last one to be received at the end of data transfer.

6. If all of these file are present on the system → start the corresponding Operational Day processes and pipelines.

7. If the files are not present, wait and start the checks again in 30 minutes.

The automated pipeline process will run autonomously and complete the data reduction process overnight to a level consistent with the state of development of the pipeline. In all three instruments all processes generate at least Level 1 products and some processes develop Level 2 products; some processes also generate Quality information, but this is still not fully implemented for all pipelines.

5.3.3 Manual pipeline operation

At the start of each working day the Data Processing Technical Assistants (DPTA) will arrive between 07:30 and 08:30z each morning and will check the state of the automated pipeline reduction. If the pipeline has run correctly during the night the DPTA will concentrate on checking the products that have been generated and, if necessary, recovery operations for any missing packets plus Quality Control procedures.

If the pipeline has failed, the various logs that are generated will be examined to locate the cause of the error. In some cases it may be due to a simple glitch in the grid, in which case the pipeline will be re-run manually. Failures due to errors in processes or to problems with the input data will be examined to establish the remedial action that is required in the process to permit recovery and to allow it to function correctly.

5.3.4 DP Scenarios

The objective for us for SIMS#1 is to check how fit our procedures are against non-nominal scenarios, and find as many 'holes' as possible.

Scenarios:

1. Failure of pipeline execution (automated or manual) .

2. Pipeline S/W error.

3. Query to the archive for a product fails.

4. Input observational/auxiliary data missing and update of DP configuration of the Versant data server.

5. Failure of ingestion of observational product into the archive.

6. Failure of the pipeline daemon.

7. Failure of the HSA serial daemon.

8. Failure of the automated cron job start up.

5.4 Preparation for the SIMS - Setting up the system at the HSC & ICCs

TBW

5.5 HCSS configuration for SIMS at the HSC

The baseline is to use the HCSS 0.6.7 release branch for the whole of SIMS #2.

5.6 Deviations from the test plan

It is unrealistic to expect that, in operations, the actual activities that take place will adjust themselves exactly to the plan prepared before launch: there will be operational contingencies; observations will fail and have to be repeated; instruments may behave in unexpected ways; disks may crash and have to be replaced; telemetry may be lost; passes may be missed; ground stations may change. No test plan ever survives contact with reality.

As the SIMS campaigns are, above all, a training exercise, they should include training for recovery scenarios and operational contingencies. If they do not, they are not realistic training for normal operations and when these situations are encountered in flight, valuable time will be lost and mistakes will be made if the team has to feel its way in an unfamiliar situation. Similarly, if the SGS personnel know exactly what contingencies are coming, their reactions will not be authentic because they will be at least mentally prepared in advance. Some

contingencies have to be planned in advance (e.g. the recovery scenarios for database and connectivity problems listed in Section 3), others though must be a surprise to be useful as training thus they are not detailed here. However, deviations from the test plan must not be so large, or so unrealistic, as to swamp personnel, especially in the initial phases of the SIMS Campaigns. It is well within realistic operational parameters to expect the team to have a greater capacity to react efficiently to unexpected scenarios as the test proceeds. It is also a realistic scenario to expect observed or perceived weaknesses in cover to be exploited to see how teams react in non-optimum circumstances and whether or not the weakness could pose genuine operational difficulties after launch that need to be solved.

6. Ground Segment Procedures required for SIMS

6.1 Introduction

This chapter defines the list of procedures required to exist at each centre to allow the personnel working at that centre to be able to perform the activities expected of them during SIMS.

6.2 Procedures at HSC

Page numbers, where given, refer to the relevant page in the Herschel Facilities Operations Manual (HFOM). This information will be updated as the HFOM gets closer to its final operational version.

6.2.1 HFOM version

The version of the HFOM that has been used to generate the list of procedures is:

HFOM v1.1 (formal release, August 8th) – to be updated with new HFOM release

HERSCHEL-HSC-DOC-0742

[**To be updated with the SIMS release of the HFOM, when available**]

6.2.2 Mission Planning System Procedures

Procedure Reference	Procedure Description	Page #
HSC-PROC-MPS-0001	Logging onto the HSC Operational workstations as MPS user	108
HSC-PROC-MPS-0002	Long-term mission planning procedures	109
HSC-PROC-MPS-0003	Advance mission planning procedures	110
HSC-PROC-MPS-0004	Short-term mission planning procedures	116
HSC-PROC-MPS-0005	Rescheduling of of scheduled ODs at advanced planning level	120
HSC-PROC-MPS-0006	Re-planning of scheduled ODs at operational mission planning level	123
HSC-PROC-MPS-0007	Mission planning procedures following a ToO or other exceptional circumstances	126
HSC-PROC-MPS-0008	Notification to users of failed observations and re-scheduling approval	127

6.2.3 Proposal Handling System Procedures

Procedure Reference	Procedure Description	Page #
HSC-PROC-PHS-0001	Logging onto the HSC Proposal Handling System	43
HSC-PROC-PHS-0002	Initial database and database server set-up procedures	45
HSC-PROC-PHS-0003	Opening the PHS application	47
HSC-PROC-PHS-0004	Pre-Phase 1 activities	52
HSC-PROC-PHS-0005	Setting the AO Programme in the DB	54

6.2.4 Data Processing System Procedures

Procedure Reference	Procedure Description	Page #
HSC-PROC-DP-0001	Systematic Data Processing Procedure	134
HSC-PROC-DP-0002	DP Installation Procedure	
HSC-PROC-DP-0003	Herschel Aux Product Generation Procedure	
HSC-PROC-DP-0004	Herschel Cal Product Ingestion Procedure	
HSC-PROC-DP-0005	Quality Control Analysis Procedure	

6.2.5 Helpdesk Procedures

Procedure Reference	Procedure Description	Page #
HSC-PROC-HPDSK-0001	Access to the Helpdesk System	125
HSC-PROC-HPDSK-0002	Management of Helpdesk Questions	127
HSC-PROC-HPDSK-0003	Management of Newsletters	128
HSC-PROC-HPDSK-0004	Management of Mass-Mailing	128

6.2.6 HSC-ICC Interface Procedures

Procedure Reference	Procedure Description	Page #
HSC-PROC-SGSINT-0001	Propagation of Data	130
HSC-PROC-SGSINT-0002	Provision of data to the Ops FTP Server	130
HSC-PROC-SGSINT-0003	Provision of Data via the HSA (summary only)	130
HSC-PROC-SGSINT-0004	Reception of Data on the FTP Server	131
HSC-PROC-SGSINT-0005	Helpdesk Interactions	132
HSC-PROC-SGSINT-0006	Quality Control Interactions	132
HSC-PROC-SGSINT-0007	OBSM Interactions	132
HSC-PROC-SGSINT-0008	HPSDB Interactions	132
HSC-PROC-SGSINT-0009	Instrument Malfunction Interactions	132
HSC-PROC-SGSINT-0010	Reception of PV Phase OD deliveries	133
HSC-PROC-SGSINT-0011	Processing of PV Phase OD Deliveries by ICS Group	133
HSC-PROC-SGSINT-0012	Processing of PV Phase OD Deliveries by HCSG Group	133
HSC-PROC-SGSINT-0013	Reception of Routine Phase OD deliveries	133
HSC-PROC-SGSINT-0014	Processing of Routine Phase OD Deliveries by ICS Group	133
HSC-PROC-SGSINT-0015	Processing of Routine Phase OD Deliveries by HCSG Group	133

6.2.7 System Data Flow Procedures

TBW

6.2.8 Quality Control Procedures

TBW

6.3 Procedures at each ICC

6.3.1 PACS Procedures

Procedure Reference	Procedure Description
PICC-ME-GP-002	Instrument Health Monitoring
PICC-ME-GP-003	Database propagation (HSC to ICC@ICC)
PICC-ME-GP-004	Product transfer (HSC to ICC@ICC)
PICC-ME-GP-005	Routine data processing
PICC-ME-GP-006	Database propagation (ICC@ICC to external ICC sites)
PICC-ME-GP-007	Trend Analysis on instrument and S/C data

6.3.2 SPIRE Procedures

Procedure Reference	Procedure Description
Draft in TWIKI page	Instrument health monitoring
Draft in TWIKI page	Generation of observing logs
Draft in TWIKI page	Trend analysis processing
Draft in TWIKI page	Transfer files from HSC
Draft in TWIKI page	Operate Helpdesk
Draft in TWIKI page	Data processing
Draft in TWIKI page	Make TA queries
Draft in TWIKI page	Data access from external ICC sites

6.3.1 HIFI Procedures

Procedure Reference	Procedure Description
Draft	Database propagation from HSC to HIFI
Draft	Generation of quality products
Draft	Inspection of products

7. PACS daily activities during SIMS

7.1 Introduction

This chapter defines the test plan and activities to by carried out by the PACS ICC during SOVT-2, as received from PACS. More details of the PACS test plan can be found in the Twiki page at the url:

http://www.herschel.be/twiki/bin/view/Pacs/Iom (TBC)

7.1.1 PACS software configuration for SIMS

7.1.1.1 Software version

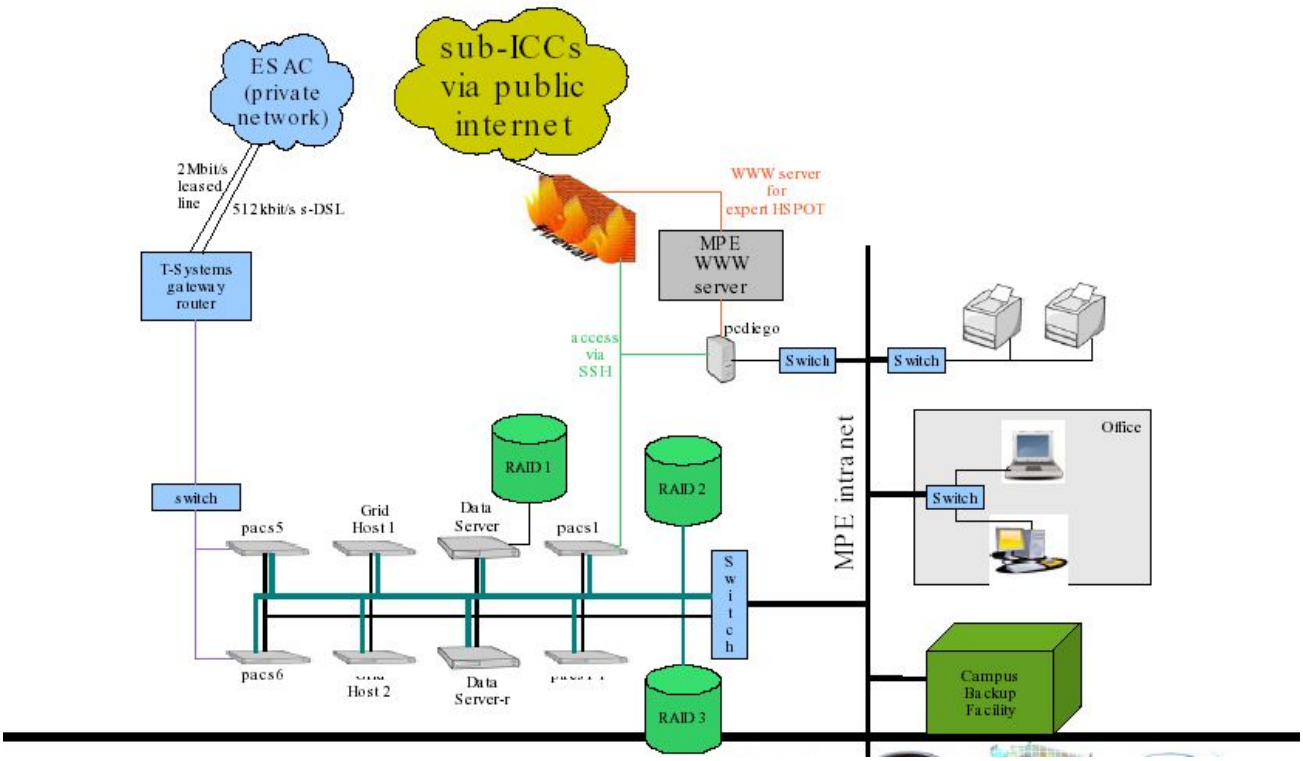
TBW

7.1.1.2 Database

TBW

7.1.2 PACS hardware configuration for SIMS

The PACS Hardware configuration for the SIMS is shown in the following flow diagram.



The PACS hardware configuration for the SOVT-1 test.

7.2 PACS proposal for SIMS contents

7.2.1 SIMS-1

7.2.1.1 Scenarios based around SOVT-2 OD-63

- Task Scenario: "Quality Control of Pipeline Products (standard AOTs)" updated and filler observations added
- Task Scenario: "Interactive analysis of small scan map" added additional standard scan maps (filler)
- Task Scenario: "Interactive Analysis of Spectrometer internal calibration block variation" added (fillers) (to be coordinated with activities for OD60 and OD64 which contain the majority of spectrometer calibration blocks)

7.2.1.1.1 Task Scenario: PACS EGSE setup at MOC

PACS IOM procedures 13.2, 13.3, 13.4, 13.5, 13.7, 13.8, 13.9

- SCOS2000
- PACS QLA
- PACS HK plotter
- Logging of R/T operations
- Transfer of data to the ICC@ICC
- Data recording

Team: E. Wiezorrek, H. Feuchtgruber

7.2.1.1.2 Task Scenario: R/T commanding of PACS mechanisms at MOC

PACS IOM procedures 16 (Flight Operations)
- Manual chopper activities
  Section 5.1.11.1.7.3 from the PACS User Manual V1.3
  - Request of IPF file exchange
- Manual grating activities
  Section 5.1.11.1.8.3 from the PACS User Manual V1.3
  - Request of IPF file exchange

Team: H. Feuchtgruber, M. Nielbock, P. Royer

7.2.1.1.3 Task Scenario: Quasi R/T data analysis of PACS mechanisms diag. HK at MOC

PACS IOM procedure 3.4
CAP ? TBW (IOM 5.3)
- Chopper PID parameter stability assessment
- Chopper transition time assessment

Team: J. Bouwman, M. Nielbock, U. Klaas
- Grating PID parameter assessment

Team: P. Royer, B. Vandenbussche, R. Huygen?

7.2.1.1.4 Task Scenario: Database propagation ESAC --> MPE

Procedure PICC-ME-GP-003
Verification of Data Propagation, PACS IOM 11.3
Team: E. Wieprecht, S. Osterhage

7.2.1.1.5 Task Scenario: Pool propagation (auxiliary data/pointing) ESAC --> MPE

Procedure PICC-ME-GP-004
Team: E. Wieprecht, S. Osterhage

7.2.1.1.6 Task Scenario: Run Pipeline @ICC

Procedure PICC-ME-GP-005 (PACS IOM 4.1, 5.1, 5.2)
Team: E. Wieprecht, J. de Jong, J. Schreiber (at MPIA?)

7.2.1.1.7 Task Scenario: Instrument Health Monitoring

Procedure PICC-ME-GP-002 (PACS IOM 4.2, 4.3, 4.5)
Team: T. Müller, V. Doublier

7.2.1.1.8 Task Scenario: Quality Control of Pipeline Products (standard AOTs)

Procedure ?
IOM ?
related procedure: HSC-PROC-DP-0005
use of Kayako system?
Team: P. Popesso

photometer:
point source AORs
PVPhotFlux_324A_StdPS_hi200Jy_grn_1Ceres_0001
scan map AORs
PVPhotSpatial_313A_StdScan_bluPA0_V814Her_0001
PVPhotSpatial_313A_StdScan_bluPA90_V814Her_0001
SOVT2_ScanMap-7 (filler)
SOVT2_ScanMap-8 (filler)

7.2.1.1.9 Task Scenario: Interactive Analysis of Cooler Recycling for PACS photometer

CAP ? TBW (IOM 5.3)

PVPhotCooler_117_nStd_na_na_0001

1) Verify auxiliary products:
   - check OOL product
   - check missing TM product
   - check mission timeline summary
   - check satellite HK product
2) Verify correct timing of recycler steps
3) Check temperature curves and final achieved cooler temperature

Team: M. Sauvage

7.2.1.1.10 Task Scenario: Interactive Analysis of VRL-VH_Blind exploration

CAP ? TBW (IOM 5.3)

PVPhotBol_110A_nStd_VrlVhBlind_na_0001

1) Verify auxiliary products:
   - check OOL product
   - check missing TM product
   - check mission timeline summary
   - check satellite HK product
2) Check correct application of (VRL,VH_Blind) low gain pairs
3) Establish (VRL, VH_Blind, output signal) surface

Team: K. Okumura

7.2.1.1.11 Task Scenario: Interactive Analysis of telescope background check

CAP ? TBW (IOM 5.3)

CPPhotBol_721A_nStd_firstBackGrd_DarkField_0001

1) Verify auxiliary products:
   - check OOL product
   - check missing TM product
   - check mission timeline summary
   - check satellite HK product
   - check pointing product
2) Check filter selection and correct looping over VH_Blind values
3) Establish move of signal level within the BOLC dynamical range

Team: K. Okumura, T. Müller

7.2.1.1.12 Task Scenario: Interactive Analysis of bias optimization high gain (restricted to nominal on-ground high gain bias value)

CAP ? TBW (IOM 5.3)

PVPhotBol_111bisA_nStdRaster_grnInitDrct_Ceres_0001

PVPhotBol_111bisA_nStdRaster_grn26Drct_Ceres_0001
PVPhotBol_111bisA_nStdRaster_FinDrct_Ceres_0001

1) Verify auxiliary products:
- check OOL product
- check missing TM product
- check mission timeline summary
- check satellite HK product
- check pointing product

2) Verify that expected raster pattern has been applied and that the off-position is contained
3) Verify that resulting signals are within nominal range
Team: M. Sauvage, K. Okumura, T. Müller

7.2.1.1.13 Task Scenario: Interactive Analysis of chopper angular calibration

CAP ? TBW (IOM 5.3)

PVPhotSpatial_312B_NStd_blu_Kbin14_0001
PVPhotSpatial_312A_NStd_blu_Kbin14_0001

1) Verify auxiliary products:
- check OOL product
- check missing TM product
- check mission timeline summary
- check satellite HK product
- check pointing product

2) Verify chopper throws, positions and orientations on the sky
Team: M. Nielbock, D. Lutz

7.2.1.1.14 Task Scenario: Interactive Analysis of photometer PSF calibration

CAP ? TBW (IOM 5.3)

PVPhotSpatial_314A_NStd_bluM1_AlfBoo_0001

1) Verify auxiliary products:
- check OOL product
- check missing TM product
- check mission timeline summary
- check satellite HK product
- check pointing product

2) Verify that chop/nod map is on right matrix position
Team: D. Lutz, P. Popesso

7.2.1.1.15 Task Scenario: Interactive Analysis of photometer FOV distortion calibration

CAP ? TBW (IOM 5.3)

PVPhotSpatial_313A_StdScan_bluPA0_V814Her_0001
PVPhotSpatial_313A_StdScan_bluPA90_V814Her_0001

1) Verify auxiliary products:
- check OOL product
- check missing TM product
- check mission timeline summary
- check satellite HK product
- check pointing product

2) Verify that scan pattern is as expected and orthogonal for the two maps

Team: D. Lutz, P. Popesso

7.2.1.1.16 Task Scenario: Interactive Analysis of photometer linearity calibration

CAP ? TBW (IOM 5.3)

PVPhotFlux_324A_StdPS_hi200Jy_grn_1Ceres_0001

1) Verify auxiliary products:
- check OOL product
- check missing TM product
- check mission timeline summary
- check satellite HK product
- check pointing product

2) Verify tracking pattern and compare with expected movement of target

3) Apply aperture photometry

Team: M. Nielbock, T. Müller, H. Dannerbauer

7.2.1.1.17 Task Scenario: Interactive Analysis of photometer AOT internal calibration block tests

CAP ? TBW (IOM 5.3)

PVPhotAOTVal_511H_nStdCalB_12rds_hr7001_001
PVPhotAOTVal_511H_nStdCalB_12rds_hr7001_002
PVPhotAOTVal_511H_nStdCalB_12rds_hr7001_003
PVPhotAOTVal_511H_nStdCalB_16rds_hr7001_001
PVPhotAOTVal_511H_nStdCalB_16rds_hr7001_002
PVPhotAOTVal_511H_nStdCalB_16rds_hr7001_003
PVPhotAOTVal_511H_nStdCalB_20rds_hr7001_001
PVPhotAOTVal_511H_nStdCalB_20rds_hr7001_002
PVPhotAOTVal_511H_nStdCalB_20rds_hr7001_003
PVPhotAOTVal_511H_nStdCalB_8rds_hr7001_001
PVPhotAOTVal_511H_nStdCalB_8rds_hr7001_002
PVPhotAOTVal_511H_nStdCalB_8rds_hr7001_003

1) Verify auxiliary products:
- check OOL product

- check missing TM product
- check mission timeline summary
- check satellite HK product
- check pointing product

2) Verify that variation of chopper plateau time is as expected
3) Derive signals and noise depending on chopper frequency
Team: H. Dannerbauer, T. Müller

7.2.1.1.18 Task Scenario: Interactive Analysis of photometer AOT validation internal hold time concept (frequency of internal calibrations)

CAP ? TBW (IOM 5.3)

PVPhotAOTVal_511G_nStdPS_intcal0_grn_HD15008_0001
PVPhotAOTVal_511G_nStdPS_intcal10_blu_HD15008_0001

1) Verify auxiliary products:
- check OOL product
- check missing TM product
- check mission timeline summary
- check satellite HK product
- check pointing product

2) Verify that data products contain the expected number of internal calibrations
3) Establish signal time series and check for impact by additional internal calibrations
Team: B. Altieri, M. Nielbock

7.2.1.1.19 Task Scenario: Interactive Analysis of photometer AOT validation nodding frequency of small source maps

CAP ? TBW (IOM 5.3)

PVPhotAOTVal_512G_nStdSmall_30s_NGC6543_0001
PVPhotAOTVal_512G_nStdSmall_60s_NGC6543_0001

1) Verify auxiliary products:
- check OOL product
- check missing TM product
- check mission timeline summary
- check satellite HK product
- check pointing product

2) Verify that chop/nod time periods are as expected
Team: B. Altieri, M. Nielbock

7.2.1.1.20 Task Scenario: Interactive analysis of small scan map (designed to be processed on a Laptop)

CAP ? TBW (IOM 5.3)

SOVT2_ScanMap-7 (filler)
SOVT2_ScanMap-8 (filler)

1) Verify auxiliary products:
- check OOL product
- check missing TM product
- check mission timeline summary
- check satellite HK product
- check pointing product

2) Check that scan pattern is as expected
3) Try to process on Laptop to Level 2
Team: B. Altieri, D. Lutz

7.2.1.1.21 Task Scenario: Interactive Analysis of spectrometer dark and straylight assessment

CAP ? TBW (IOM 5.3)

PVSpecFlux_4310D_nStdDarkCSSimultWarmUp_eng_na_0001

1) Verify auxiliary products:
- check OOL product
- check missing TM product
- check mission timeline summary
- check satellite HK product

2) Verify dark configurations (chopper, filter wheel positions)
3) Verify heat-up of internal cal sources
4) Establish dark signals
5) Establish signal time series while heating-up internal cal sources
Team: P. Royer, B. Vandenbussche, H. Dannerbauer

7.2.1.1.22 Task Scenario: Interactive Analysis of internal CS stabilization after short cool-down time only

CAP ? TBW (IOM 5.3)

PVSpecSetup_na_nStd_orbitpro_short_0001

1) Verify auxiliary products:
- check OOL product
- check missing TM product
- check mission timeline summary
- check satellite HK product

2) Establish heat-up time and temperature stabilization within assigned waiting time
Team: H. Dannerbauer

7.2.1.1.23 Task Scenario: Interactive Analysis of spectrometer wavelength calibration

CAP ? TBW (IOM 5.3)

PVSpecWave_421A_nStdRS_nochoporderA_Jupiter_0002
PVSpecWave_421A_nStdRS_nochoporderB_Jupiter_0003
PVSpecWave_421A_nStdRS_nochoporderB_Jupiter_0004
PVSpecWave_421B_nStdCRE_setup_Dummy_0001

1) Verify auxiliary products:
- check OOL product
- check missing TM product
- check mission timeline summary
- check satellite HK product
- check pointing product

2) Check tracking pattern
3) Check bias voltage settings
4) Check grating ranges and step sizes are as expected
Team: H. Feuchtgruber

7.2.1.1.24 Task Scenario: Interactive Analysis of FOV calibration spectrometer

CAP ? TBW (IOM 5.3)

PVSpecFlux_4310B_nStdFovScan_60-2_DarkField_0001
PVSpecFlux_4310B_nStdFovScan_60-3_DarkField_0001

1) Verify auxiliary products:
- check OOL product
- check missing TM product
- check mission timeline summary
- check satellite HK product
- check pointing product

2) Check chopper pattern is as expected
3) Check grating wavelengths are as expected
4) Establish full Fov maps
Team: J. Blommaert, J. Schreiber

7.2.1.1.25 Task Scenario: Interactive Analysis of Central Pointing Position spectrometer (Focal Plane Geometry spectrometer)

CAP ? TBW (IOM 5.3)

PVSpecSpatial_411_nStd9x9RC_00_w75_IRAS22134_0001

1) Verify auxiliary products:
- check OOL product
- check missing TM product
- check mission timeline summary
- check satellite HK product
- check pointing product

2) Verify that raster pattern is as expected
3) Verify that chopper is at optical zero

4) Verify selected wavelength
Team: A. Contursi

7.2.1.1.26 Task Scenario: Interactive Analysis of spectrometer FOV distortion calibration

CAP ? TBW (IOM 5.3)

PVSpecSpatial_412_nStdScaCh45d_00_IRAS22134_0001
PVSpecSpatial_412_nStdScaCh135d_00_IRAS22134_0001

1) Verify auxiliary products:
- check OOL product
- check missing TM product
- check mission timeline summary
- check satellite HK product
- check pointing product

2) Verify that scan pattern is as expected and orthogonal for the two maps
Team: A. Contursi, V. Doublier

7.2.1.1.27 Task Scenario: Interactive Analysis of Ge:Ga responsivity monitoring

CAP ? TBW (IOM 5.3)

CPSpecGeGa_na_nStdRespMonitorLoop_SOVT2_na_0001

1) Verify auxiliary products:
- check OOL product
- check missing TM product
- check mission timeline summary
- check satellite HK product

2) Check that selected bias settings are applied
3) Check signal/noise dependence on bias voltage
Team: P. Royer, J. Schreiber

7.2.1.1.28 Task Scenario: Interactive Analysis of curing scenarios

CAP ? TBW (IOM 5.3)

CPSpecGeGa_na_nStdCuringExplore_SOVT2_na_0001

1) Verify auxiliary products:
- check OOL product
- check missing TM product
- check mission timeline summary
- check satellite HK product

2) Check applied flash settings are as expected
3) Check resulting detector signals (saturated/unsaturated)
Team: P. Royer, J. Bouwman

7.2.1.1.29 Task Scenario: Interactive Analysis of GeGa raw data

CAP ? TBW (IOM 5.3)

CPSpecGeGa_na_nStdBufferTransmission_SOVT2_na_0001

1) Verify auxiliary products:
- check OOL product
- check missing TM product
- check mission timeline summary
- check satellite HK product

2) Evaluate raw ramps
3) Check linearity of raw ramps
Team: P. Royer, J. Bouwman

7.2.1.1.30 Task Scenario: Interactive Analysis of Spectrometer internal calibration block variation

CAP ? TBW (IOM 5.3)

PVSpecFlux_431A_nStdSlewCal_20_DarkField_0002 (filler)
PVSpecFlux_431A_nStdSlewCal_20_DarkField_0003 (filler)
PVSpecFlux_431A_nStdSlewCal_17_DarkField_0003 (filler)
PVSpecFlux_431A_nStdSlewCal_18_DarkField_0002 (filler)
PVSpecFlux_431A_nStdSlewCal_14_DarkField_0003 (filler)
PVSpecFlux_431A_nStdSlewCal_18_DarkField_0003 (filler)
PVSpecFlux_431A_nStdSlewCal_21_DarkField_0002 (filler)
PVSpecFlux_431A_nStdSlewCal_15_DarkField_0001 (filler)
PVSpecFlux_431A_nStdSlewCal_15_DarkField_0002 (filler)
PVSpecFlux_431A_nStdSlewCal_19_DarkField_0003 (filler)
PVSpecFlux_431A_nStdSlewCal_21_DarkField_0001 (filler)
PVSpecFlux_431A_nStdSlewCal_21_DarkField_0003 (filler)

1) Verify auxiliary products:
- check OOL product
- check missing TM product
- check mission timeline summary
- check satellite HK product
- check pointing product

2) Check that settings are as expected
3) Intercompare signals of the calibration blocks
(to be coordinated with activities for OD60 and OD64)
4) Check reproducibility of repeared blocks with same setting
Team: J. Blommaert, C. Jean, B. Vandenbussche, T. Müller

7.2.1.1.31 Task Scenario: Interactive Analysis of chopper PID fine tuning

CAP ? TBW (IOM 5.3)

CPMechChop_232A_nStd_PidFinetuningShort_na_0002

1) Verify auxiliary products:
- check OOL product
- check missing TM product
- check mission timeline summary
- check satellite HK product

2) Check that intended parameter settings have been applied
3) Evaluate position and current sensor diagnostic HK and derive chopper modulation function shapes and their transition times

Team: M. Nielbock, J. Bouwman

7.2.1.2 Scenarios based around SOVT-2 OD-64

7.2.1.2.1 Task Scenario: PACS EGSE setup at MOC and listen-in to data dump of OD63 (PACS day) during DTCP64

PACS IOM procedures 13.2, 13.3, 13.4, 13.5, 13.7, 13.8, 13.9
- SCOS2000
- PACS QLA
- PACS HK plotter
- Logging of R/T operations
- Transfer of data to the ICC@ICC
- Data recording

Team: E. Wiezorrek, H. Feuchtgruber

7.2.1.2.2 Task Scenario: Database propagation ESAC --> MPE

Procedure PICC-ME-GP-003
Verification of Data Propagation, PACS IOM 11.3
Team: E. Wieprecht, S. Osterhage, (E. Wiezorrek)

7.2.1.2.3 Task Scenario: Pool propagation (auxiliary data/pointing) ESAC --> MPE

Procedure PICC-ME-GP-004
Team: E. Wieprecht, S. Osterhage, (E. Wiezorrek)

7.2.1.2.4 Task Scenario: Run Pipeline @ICC

Procedure PICC-ME-GP-005 (PACS IOM 4.1, 5.1, 5.2)
Team: E. Wieprecht, J. de Jong, J. Schreiber (at MPIA?)

7.2.1.2.5 Task Scenario: Instrument Health Monitoring

Procedure PICC-ME-GP-002 (PACS IOM 4.2, 4.3, 4.5)

Team: H. Feuchtgruber, T. Müller

7.2.1.2.6 Task Scenario: Trend analysis on instrument and S/C data

Procedure PICC-ME-GP-007 (PACS IOM 4.4)
Team: T. Müller, S. Osterhage, V. Doublier

7.2.1.2.7 Task Scenario: Quality Control of Pipeline Products (standard AOTs)

Procedure ?
IOM ?
related procedure: HSC-PROC-DP-0005
use of Kayako system?
Team: P. Popesso

photometer:
point source AORs
CPPhotFPG_261E_StdPS_blu_SAA_CSDra_0002
CPPhotFPG_261E_StdPS_blu_SAA_HIP58225_0002
CPPhotFPG_261E_StdPS_blu_SAA_HIP67627_0002
CPPhotFPG_261E_StdPS_blu_SAA_HIP62223_0002
CPPhotFPG_261E_StdPS_blu_SAA_HIP65006_0002
CPPhotFPG_261E_StdPS_blu_SAA_PPM102025_0002

7.2.1.2.8 Task Scenario: Interactive Analysis of Parallel Cooler Recycling for PACS photometer

CAP ? TBW (IOM 5.3)

SpireEngParallelCoolerRecycleGen

1) Verify auxiliary products:
   - check OOL product
   - check missing TM product
   - check mission timeline summary
   - check satellite HK product
2) Verify correct timing of recycler steps
3) Check temperature curves and final achieved cooler temperature
4) Compare with OD60 results
5) Establish empirical minimum cooler hold times for SOVT-2 period

Team: M. Sauvage

7.2.1.2.9 Task Scenario: Interactive Analysis of Photometer Pointing Calibration

Spacecraft APE Measurements:
CAP ? TBW (IOM 5.3)

CPPhotFPG_261E_StdPS_blu_SAA_CSDra_0002
CPPhotFPG_261E_StdPS_blu_SAA_HIP58225_0002
CPPhotFPG_261E_StdPS_blu_SAA_HIP67627_0002
CPPhotFPG_261E_StdPS_blu_SAA_HIP62223_0002
CPPhotFPG_261E_StdPS_blu_SAA_HIP65006_0002
CPPhotFPG_261E_StdPS_blu_SAA_PPM102025_0002

1) Verify auxiliary products:
- check OOL product
- check missing TM product
- check mission timeline summary
- check satellite HK product
- check pointing product

2) Compare pointing with expected position
3) Calculate sigma of pointing deviation from expected position
4) Check that SIAM update from OD60 had expected effect
5) Test prototype pointing calibration CAP
Team: B. Altieri, M. Sanchez-Portal (at HSC), D. Lutz

SRPE measurement raster mode:
CAP ? TBW (IOM 5.3)

CPPhotFPG_262A_nStdRaster_blu_gypro_HIP21479_0001

1) Verify auxiliary products:
- check OOL product
- check missing TM product
- check mission timeline summary
- check satellite HK product
- check pointing product

2) Compare pointing with expected position
3) Check that raster pattern is as expected
4) Check gyro propagation corrected pointing with uncorrected pointing to assess the effect of gyro propagation
Team: B. Altieri, M. Sanchez-Portal (at HSC), D. Lutz

7.2.1.2.10 Task Scenario: Interactive Analysis of SPIRE/PACS Parallel Mode

CAP ? TBW (IOM 5.3)

PVParAOTVal_515A_StdParallel_green_fast_betaUMi_nom
PVParAOTVal_515B_StdParallel_blu_slow_ngc6946_ortho

1) Verify auxiliary products:
- check OOL product
- check missing TM product
- check mission timeline summary
- check satellite HK product
- check pointing product

2) Check scan patterns and speeds are as expected
3) Check read-out mode

Team: S. Pezzuto

7.2.1.2.11 Task Scenario: Interactive Analysis of Spectrometer AOT Validation

Wave Switch AOTs
CAP ? TBW (IOM 5.3)

PVSpecAotVal_522_NStd_WS_no_cal_1_NGC7027_0001
PVSpecAotVal_522_NStd_WS_no_cal_2_NGC7027_0001
PVSpecAotVal_522_NStd_WS_no_cal_3_NGC7027_0003 (rescheduled with modifications!)

1) Verify auxiliary products:
- check OOL product
- check missing TM product
- check mission timeline summary
- check satellite HK product
- check pointing product

2) Check raster pointings are as expected
3) Check grating positions are as expected
4) Check effects by different DECMEC sequences (cal_1 and cal_2)
5) Compare signals of PVSpecAotVal_522_NStd_WS_no_cal_3_NGC7027_0003 with those of PVSpecAotVal_522_NStd_WS_no_cal_3_NGC7027_0001 from OD60 with different capacitor settings

Team: R. Vavrek, D. Fadda et al. (at NHSC)

7.2.1.2.12 Task Scenario: Interactive Analysis of Spectrometer RSRF calibration on internal calibration sources

CAP ? TBW (IOM 5.3)

PVSpecFlux_438A_nStdSlewCal_A_DarkField_0001
PVSpecFlux_438A_nStdSlewCal_B_DarkField_0001
PVSpecFlux_438A_nStdQuickFull_CS1_DarkField_0001
PVSpecFlux_438A_nStdSlewCal_A_DarkField_0002
PVSpecFlux_438A_nStdSlewCal_B_DarkField_0002
PVSpecFlux_438A_nStdQuickFull_CS2_DarkField_0001

1) Verify auxiliary products:
- check OOL product
- check missing TM product
- check mission timeline summary
- check satellite HK product
- check pointing product

2) Check chopper positions are as expected on CSs
3) Check grating position ranges and step sizes are expected
4) Evaluate signals
5) Perform wavelength calibration

6) Derive RSRF from internal calibrator spectrum
7) Check consistency between CS1 and CS2 RSRF
Team: B. Vandenbussche, J. Blommaert, C. Jean

7.2.1.2.13 Task Scenario: Interactive Analysis of Spectrometer internal calibration block variation

CAP ? TBW (IOM 5.3)

PVSpecFlux_431A_nStdSlewCal_01_DarkField_0001
PVSpecFlux_431A_nStdSlewCal_02_DarkField_0001
PVSpecFlux_431A_nStdSlewCal_03_DarkField_0001
PVSpecFlux_431A_nStdSlewCal_04_DarkField_0001
PVSpecFlux_431A_nStdSlewCal_05_DarkField_0001
PVSpecFlux_431A_nStdSlewCal_06_DarkField_0001
PVSpecFlux_431A_nStdSlewCal_07_DarkField_0001
PVSpecFlux_431A_nStdSlewCal_08_DarkField_0001

1) Verify auxiliary products:
- check OOL product
- check missing TM product
- check mission timeline summary
- check satellite HK product
- check pointing product

2) Check that settings are as expected
3) Intercompare signals of the calibration blocks
(to be coordinated with activities for OD60 and OD63)
Team: J. Blommaert, C. Jean, B. Vandenbussche, T. Müller

7.2.2 SIMS-2

Many of the tests intended for SIMS-1 could not be carried out due to problems with the PACS database that have now been solved. It is intended that most of them should be repeated. The overall top-level objectives for PACS in SIMS-2 are:

(1) Bring PACS ICC set-up into launch configuration
- Use of identical S/W compared to HSC
- Installation of new H/W: two new RAID arrays

(2) Participation in Propagation
- Telemetry
- Auxiliary files
- Test of HSC-ICC interfaces

(3) Use of HSA

(4) Validation of PACS Pipeline
- Tests of each AOT/module based on SOVT-1/-2 test data
- Special topics: Flux calibration, glitches, map making

(5) Validation of selected CoP/PV AORs using the PACS FS ILT set-up.

8. SPIRE daily activities during SIMS

8.1 Introduction

This chapter defines the activities to be carried out by the SPIRE ICC during SIMS. More details of the SPIRE test plan can be found in the Twiki page at the url:

http://www.herschel.be/twiki/bin/view/Spire/DPTestPlanSOVT-2 (TBC)

8.1.1 SPIRE software configuration for SIMS

8.1.1.1 Software version

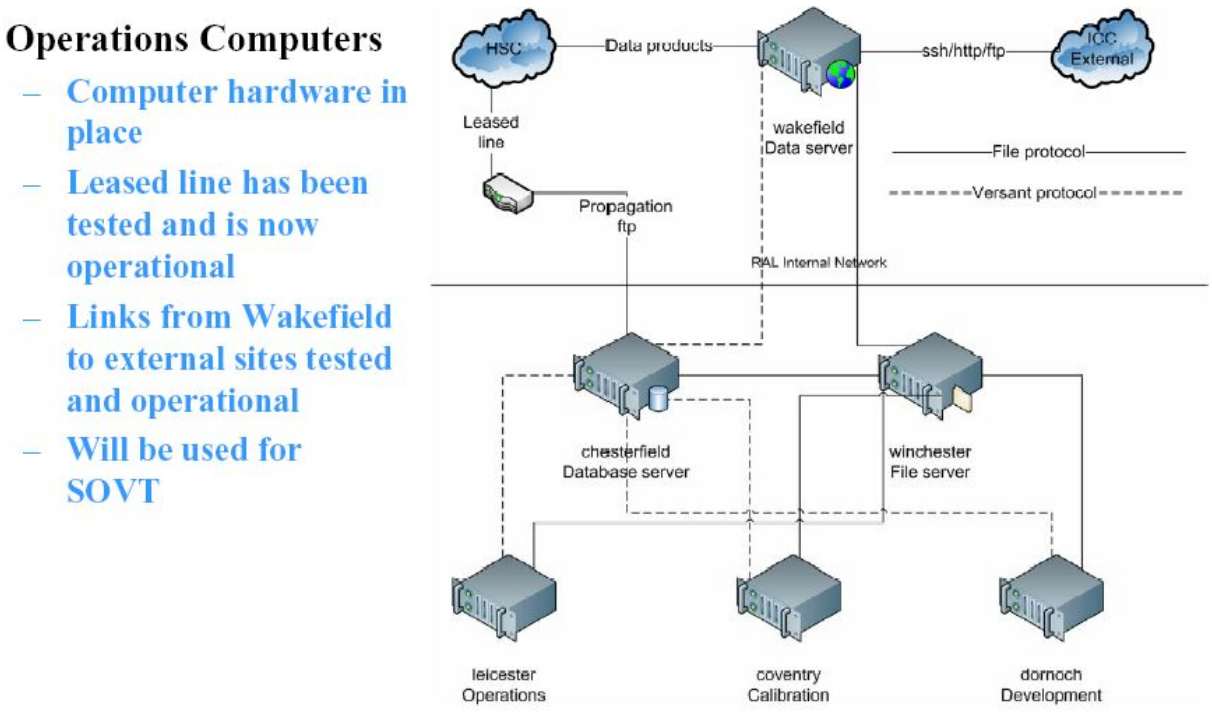
TBC

8.1.1.2 Database

TBC

8.1.2 SPIRE hardware configuration for SIMS

The SPIRE Hardware configuration for the SIMS is shown in the following flow diagram.



The SPIRE hardware configuration for the SOVT-2 test.

8.2 Planned activities

8.2.1 SIMS-1

Due to the pressure of other commitments, SPIRE will support the interfaces (i.e. daily Videocons, propagation, etc.), but not supply inputs for the Test Plan.

8.2.2 SIMS-2

As bullet points a top-level summary of SPIRE SIMS-2 activities is:

- No hardware changes are planned.
- The software needs to be upgraded to 0.6.7.
- Most of the elements of the Test Plan will be exercised, but SPIRE is not quite ready for the Bulk Data Transfer – this needs some more ID work from Steve Guest.
- SPIRE will run a Helpdesk and will have 10/7 support.

9. HIFI daily activities during SIMS

9.1 Introduction

This chapter defines the activities to be carried out by the HIFI ICC during SIMS.

9.1.1 HIFI software configuration for SIMS

9.1.1.1 Software version

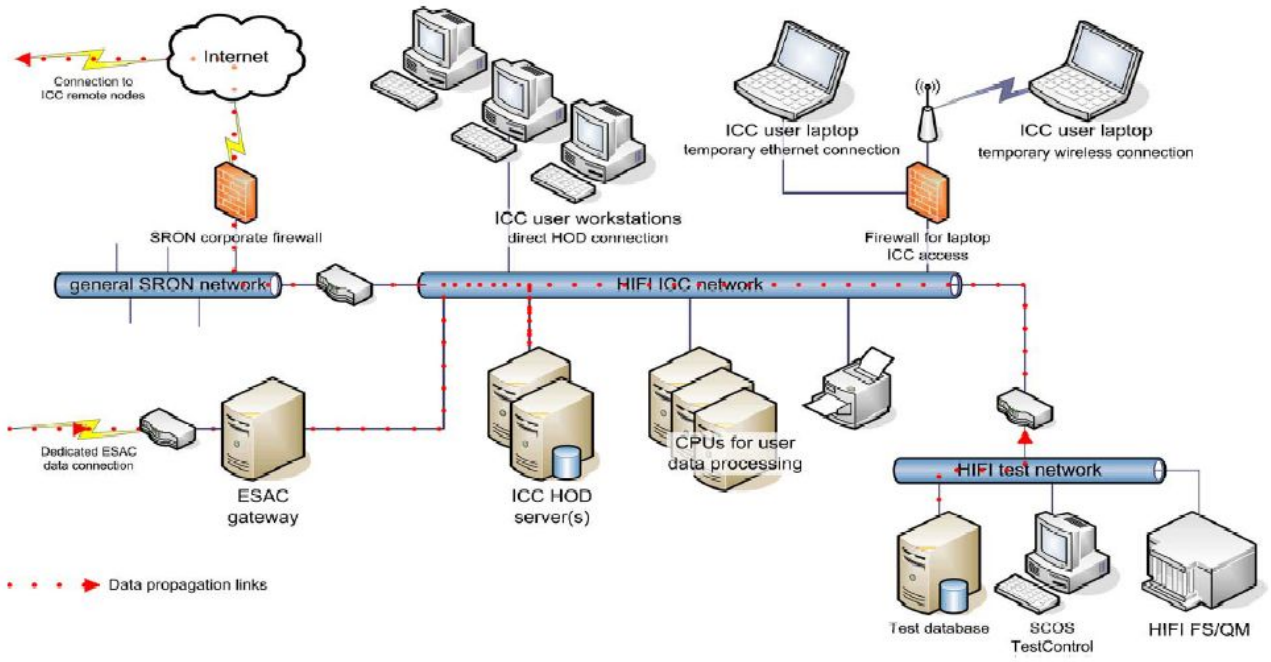
TBC

9.1.1.2 Database

TBC

9.1.2 HIFI hardware configuration for SIMS

The HIFI Hardware configuration for the SIMS is shown in the following flow diagram.



The HIFI hardware configuration for the SOVT-2 test.

9.2 Planned activities

9.2.1 SIMS-1

Due to the priorities in the HIFI project HIFI will not support both campaigns in a full 10hr/7day sense. Especially for or the SIMS 1 campaign in February the support will be fairly limited. HIFI intends to support the exercising of the interfaces in which we are involved; uplink deliveries, SxR processing in cCCBs and especially the database handling. HIFI is definitely not intending to have a full training in which the full ICC is involved, in principle we will only give normal workday support (we would appreciate it if you could as much as possible schedule the interface activities that HIFI must support during weekdays).

9.2.2 SIMS-2

For SIMS 2 HIFI does - at this time - intend to involve a full ICC, 10/7, and do training. We have called for a co-location period in March so many of our consortium partners should be at SRON for that period.

The HIFI SIMS-2 baseline is

HIFI will offer the same level of support as for SIMS-1 with the following additions:

- 10/7 support during the campaign, although the HIFI consortium meeting during week 2 may reduce the support level.
- Pipeline validation activities. There is a co-location at present to work on this.
- Training of ICC personnel to back up Michael Olberg.

No hardware upgrades are planned.

The HIFI objectives for SIMS-2 are:

1. Pipeline "walk-through" and extensive testing on SOVT-2 data.

2. Exercise trend analysis prototype.

3. Check HIFI procedure document against daily routines and complement/update where necessary.

4. Train people in mission planning system.

5. Test node distributed database system

    * Chained propagation
    * User access logging
    * Database lists (web pages)
    * Regular automatic db backups
    * Restore backups on another machine

6. Bulk product transfer

    * Automatic transfer
    * Product list (web pages)
    * Back-up of database

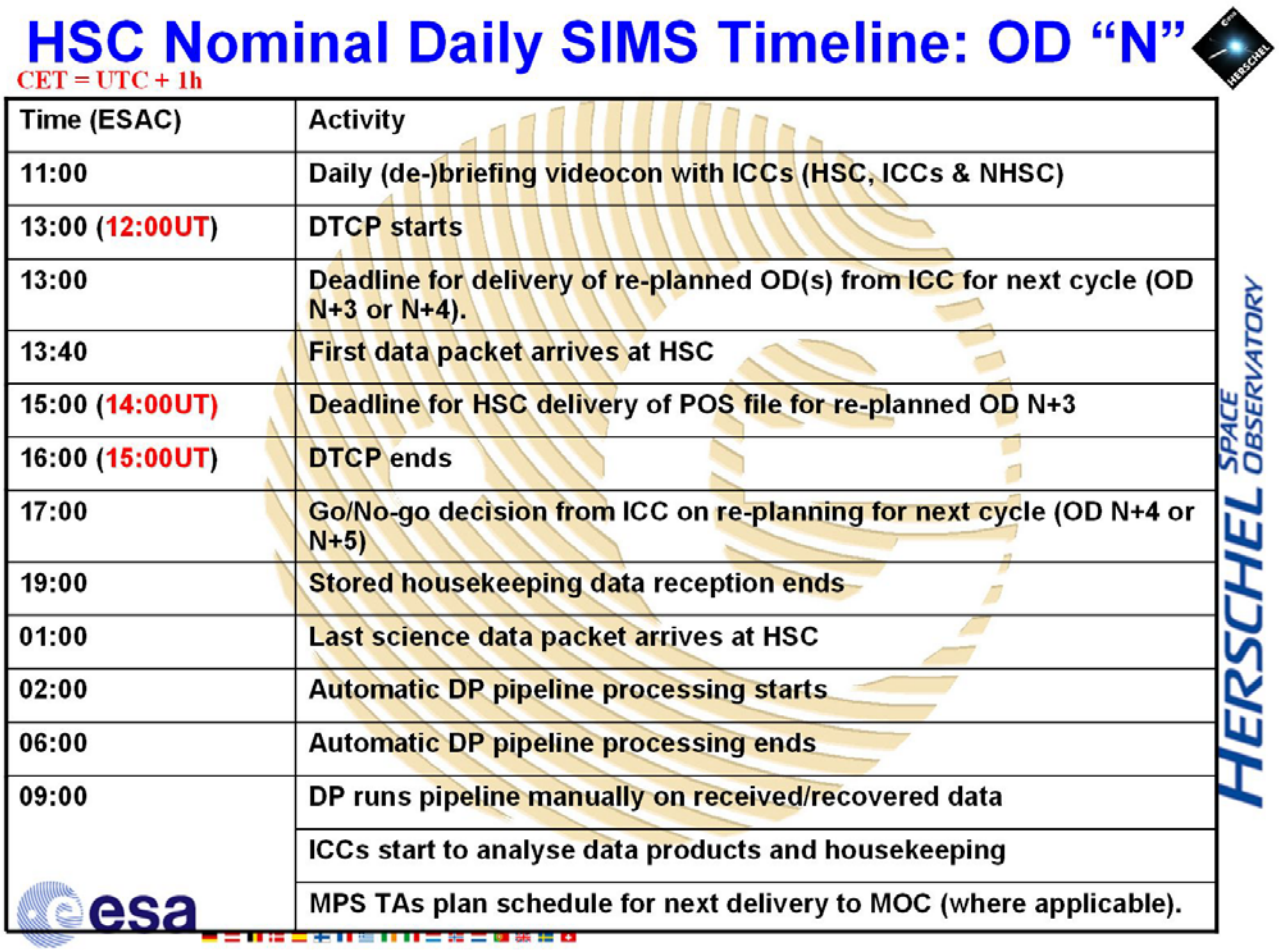
7. Verify that the spacecraft velocity is applied correctly for the HIFI frequency setting.

8. Perform a software update

10. HSC daily activities during SIMS

10.1 Introduction

The following figure gives a top-level overview of HSC daily activities during SIMS when the DTCP is being held at 12:00z.



HSC Nominal Daily SIMS Timeline: OD "N"

CET = UTC + 1h

Time (ESAC)	Activity
11:00	Daily (de-)briefing videocon with ICCs (HSC, ICCs & NHSC)
13:00 (12:00UT)	DTCP starts
13:00	Deadline for delivery of re-planned OD(s) from ICC for next cycle (OD N+3 or N+4).
13:40	First data packet arrives at HSC
15:00 (14:00UT)	Deadline for HSC delivery of POS file for re-planned OD N+3
16:00 (15:00UT)	DTCP ends
17:00	Go/No-go decision from ICC on re-planning for next cycle (OD N+4 or N+5)
19:00	Stored housekeeping data reception ends
01:00	Last science data packet arrives at HSC
02:00	Automatic DP pipeline processing starts
06:00	Automatic DP pipeline processing ends
09:00	DP runs pipeline manually on received/recovered data
	ICCs start to analyse data products and housekeeping
	MPS TAs plan schedule for next delivery to MOC (where applicable).

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Note that, as shown in Section 2.4.4, in most cases the overhead on re-planning is such that, on OD-N, any re-planning would normally be for OD-N+4. However, there is the possibility, in an emergency, to go for a very fast turnaround cycle, re-planning OD-N+3: this though imposes extremely tight deadlines on deliveries and very little time for data analysis before re-planning.

10.2 Coordination activities during SIMS

The HSC will coordinate SIMS preparations through a series of weekly Videocons with the ICCs. See Section 2.4 for more details

During the execution of SIMS the HSC will organise daily briefings and de-briefings with all the interested parties in the SGS. See Section 12 for more details and also the daily timeline of activities at the HSC (above).

10.3 TM ingest and data propagation activities during SIMS

The HSC acts as the hub for TM ingest and data propagation to the ICCs. See Section 3.1.1 for details.

10.4 Community Support Group activities during SIMS

10.4.1 SIMS#1

Planned Community Support Group activities during SIMS-1 are:

- Reception and processing of input files delivered by the ICCs containing PV Phase observations (one calibration proposal per OD, with maybe the exception of the initial Pointing/Commissioning Phase OD), after revision and approval by the ICS team @ HSC following existing procedures.

- Generation of POS files corresponding to ODs 65 to 78 and delivery to MOC exercising the existing procedures for Mission Planning activities during PV Phase, including review by ICS team @ HSC and approval by the Project Scientist.

- Exercise procedures associated to Data Quality Control.

- Exercise de-commitment and re-planning of scheduled PV observations under various contingency scenarios.

- Verify correct ingestion of data products generated during the simulation exercise in HSA and access from ICCs.

10.4.2 SIMS#2

The aim of SIMS #2 for the Community Support Group is to exercise:

- General training
- Manual commanding
- Parallel Mode deliveries
- Long term mission planning with routine observations
- Software synchronisation
- Delivery and configuration tracking
- The staging database
- Quality Control tickets

The group expects to receive and have to react to some surprises in week 2 of SIMS #2.

One departure from strict reality will be the fact that hardware and software cannot be made ready in time to allow Mission Planning to follow an exactly realistic planning and delivery cycle if that requires the Mission Planners to start their simulation in the week before the designated simulation period. It will be necessary to arrange the simulation so that the Mission Planners are performing forward-looking activities in parallel with

other SIMS activities in the first week of the simulation. LM responded that the essential thing is that people are working in a realistic way. (The MPS activities don't have to be in series with the simulation period since the Uplink and Downlink activities are not strongly coupled. Their internal sequencing or timing must be realistic however.)

10.5 Instrument and Calibration Scientist team activities during SIMS #2

The aim of the ICS Team will be to check deliveries and procedures as well as exercise Quality Control on pipeline products. Overall, the role of the ICS Team is deeply connected with the ICCs and they themselves that should speak for instrument calibration, backed-up by the ICS Team, in line with the mission design and the long emphasis on heavy co-location of the Calibration Scientists during the Development Phase..

10.6 Software maintenance team activities during SIMS

The HCSS Software Maintenance Team is responsible for maintaining the core HCSS software, including the uplink chain, telemetry ingestion, database and common libraries. The uplink chain comprises the Proposal Handling System (PHS), Scientific Mission Planning System (SMPS), Common Uplink System (CUS) for instrument commanding and MIB (spacecraft database) ingestion.

Maintenance of the Data Processing (DP) code is handled separately by the DP team and instrument teams. However, the maintenance team is responsible for making releases of the entire system, including DP, and installing them on the ESAC systems.

The role of the Software Maintenance Team during the simulations will be:

- To prepare and install the HCSS software needed for the simulations,

- To investigate and fix critical problems arising during the simulations,

- To make and install new software releases as necessary,

- To configuration control software changes and releases.

Problem reports on non-critical problems will be handled as normal work both during and following the simulations period.

10.7 Data Processing activities during SIMS

All science data will go through both automatic and manual pipeline processing and posterior archiving. See Section 5.3 for details.

10.8 Computer and network Support activities during SIMS

The following CSG people will be supporting SIMS-1 from 2/Feb/2009 until 16/Feb/2009:

- Jose Manuel Blanco (8x5 on-site + rest of the time on-call)

- Daniel Tapiador (8x5 on-site + rest of the time on-call)

- Computer Operators providing 24x7 on-site support from 2/Feb/2009 until 10/Feb/2009. The rest of the time in 12.5x7

Ruben Álvarez will be coordinating the CSG support (8x5 on-site + rest of the time on-call)

10.9 Archive Support activities during SIMS

The planned Archive Support activities for SIMS are:

- Verify correct ingestion of the products into the HSA

- Verify correct access of the data by the ICCs

- Verify that Data Quality Control information is properly generated and processed according to the established procedures

10.10 HSC Support during SIMS

The baseline for coverage during CoP/PV Phase is 10/7, i.e. 10 hours per day, seven days a week. During CoP/PV the basic measure of time is not the week, but the cycle - PACS/SPIRE/HIFI/Parallel (or similar). This cycle does not respect weekends or holidays, thus if the SIMS campaigns are to reflect operational reality, they must be baselined for 10/7 coverage. In this way we will identify the operational problems that result from not having all personnel or support services available on any particular day.

All personnel will be rostered to staff the mission in such a way that each person works 5 days (of 10 hours each) on and then has 2 days off. Group Leaders will provide a roster for their group, showing a 5-on-2-off coverage of the group functions spanning the duration of each of the SIMS campaigns.

All teams should also maintain provision for possible on-call cover, where needed, reacting to contingencies as they would during the real PV Phase.

11. NHSC activities during SIMS

11.1 Introduction

The NASA Herschel Science Center (NHSC) has been established by NASA to support to astronomical community based in the USA in its use of the Herschel Space Observatory. As part of its charge to NASA, the NHSC must provide a detailed understanding of the Herschel science instruments, data processing, and the general ground and flight systems. To fulfil, in part, this charge, the NHSC has established close ties with the three Instrument Control Centres and the Herschel Science Centre that include general support of testing. The test support includes all phases of Herschel ground and flight testing.

11.2 NHSC Science Liaison to the HSC

To maintain a direct link with HSC during the Herschel mission, NHSC is providing a full time NHSC/HSC Liaison Scientist who will reside in Spain for the duration of the cryogenic mission. At least half the Liaison Scientist's time will be spent on HSC activities under direction of the HSCOM. SIMS provides an important opportunity for the NHSC representative to assume his liaison role at HSC and to participate in active testing in an operationally realistic way.

11.3 NHSC SIMS Activities

The HIFI ICC will chain-propagate data to the NHSC during SIMS.

12. Briefing and reporting procedures during SIMS

12.1 Introduction

SIMS is, above all, a large team exercise that tests out all interactions, both human and systems in the SGS. SIMS will test the fast turn-around times and demanding feedback interactions of the PV Phase of spacecraft activities. This makes the rapid flow of accurate information between centres of the maximum interest to all for the effective and efficient execution of SIMS. Similarly, many individuals are involved in the overall machinery, each adding their own small piece to the overall jigsaw of actions and interactions, very few of whom have an overall view of the entire system. This makes the free flow of information essential so that each person involved in the tests appreciates the importance of their own work to the Big Picture.

For SIMS the interactions will be facilitated by a series of daily telecon and Videocon briefings and de-briefings similar to those implemented in the SOVT exercises. It is expected that all personnel on-shift will attend the daily HSC briefing.

12.1 The daily briefing structure

The daily briefing structure follows the template in Appendix 1 and is determined by the following strictures:

- Seven centres are involved on two continents and three time zones ranging from UT-7h to UT+2h.
  - Timings are a compromise that will generally not be perfect for anyone, but attempt to reduce inconvenience to individual groups as much as possible.
- It was judged optimal to have the HSC/SGS briefing at the start of each working day, so that all ICCs become aware of any developments during the night that might affect their working schedule for the next 24 hours. But not all ICCs are on the same time zone, so this morning briefing must not be too early in the morning. However this constraint also yields a fundamental incompatibility between the requirements of SPIRE and for NHSC for which a later time slot becomes a start time well after midnight.

The following structure has been adopted:

12.1.1 Morning briefing

12.1.1.1 Timing

10:00 UT, 11:00 CET

SPIRE is on GMT (= UT) while the HSC, PACS and HIFI are on CET (UT+1h). Timed to allow the HSC and ICCs to react to overnight events and, in the case of detecting problems, to analyse and resolve them, if possible, but making it as early in the working day for all centres as is practical.

Note that the timing is very bad for the NHSC (UT−7h) as it implies a 03:00am start. It is important that co-location will be possible of NHSC personnel who will then brief personnel at the NHSC.

12.1.1.2 Expected duration

30 minutes (45 maximum).

12.1.1.3 Frequency

Daily for All days of SIMS

12.1.1.4 Format

Videocon

12.1.1.5 For whom?

HSC + NHSC + ICCs

12.1.1.6 Purpose

This is the main daily de-briefing and briefing of planned activities for the new day for all personnel involved in SIMS, with the exception of MOC. Each team will report on its activities, their status, tests completed successfully, anomalies noted and system status following a set meeting template. The purpose of the Videocon is to give all actors in SIMS the fullest possible picture of what is happening overall and that this information be obtained first-hand from the people carrying out the activities. All personnel at the HSC are expected to attend. Town Hall format, with roving microphone to allow those present to question the speakers.

This morning briefing will set-up all participants for the day's activities.

12.1.2 Local briefings at HSC

12.1.2.1 Timing

To be combined with the main Morning briefing. Where necessary, the HSC team (HSC + SAT + ECSG) may meet 15 minutes ahead of the start of the morning Videocon for local notices.

12.1.2.2 Expected duration

15 minutes (maximum)

12.1.2.3 Frequency

Daily for All days of SIMS.

12.1.2.4 Format

Live in ESAC. Room A-23A (TBC).

12.1.2.5 For whom?

All HSC personnel on duty, plus local supporting groups (ESAC Computer Support, SAT).

12.1.2.6 Purpose

- To inform all personnel working on SIMS of the status of activities and of any anomalies that will impact on their daily work.
- Also as a team-building exercise so that each member of the team knows and understands where his or her own work fits into the Big Picture.

13. APPENDIX I – Template for Daily De-briefings

Date:

TEMPLATE FOR THE DAILY (DE-)BRIEFING (v3.0)

***De-briefing part* (all cases main discussion offline) :**
PURPOSE is to record major status: Some slots may be empty with Status NOMINAL.

0. Declare functions represented and Spokespersons:

HSCOM/HSCDM/PS	☐	
SYS.ENG./scoe	☐	
HSC/HCSG	☐	
HSC/DP	☐	
HSC/Instr.Cal.	☐	
HSC/Software Maint.	☐	
HSC/HSA	☐	
HIFI ICC	☐	
PACS ICC	☐	
SPIRE ICC	☐	
NHSC	☐	
Comp.Supp.	☐	
Test COORD.	☐	

1. Status of the Spacecraft
(by System Engineer, Test Coordinator or Meeting Chair)

4. Status of the ICC systems and main ICC events of the previous or ongoing OD
(ICC Representatives)
- events as planned
- deviations from the plan

- HIFI

- PACS

- SPIRE

5. Status of NHSC systems and main NHSC events of the previous or ongoing OD
(by NHSC Representative)
- events as planned
- deviations from the plan

6. Outcome of principal activities of the OD
(by Test Coordinator, System Engineer, Function, ICC or NHSC Representatives as appropriate. Only major items reported in extreme brevity.)

7. Declare success/fail of OD events per Instrument, ICC, HSC or for the Spacecraft (as appropriate)

Briefing Part (Day n):

0. Declare primary functions for upcoming OD and their Spokespersons
(If different from de-briefing)

HSCOM/HSCDM/PS	☐	
Sys.Eng/SCOE	☐	
HSC/HCSG	☐	
HSC/DP	☐	
HSC/Instr.Cal.	☐	
HSC/Software Maint.	☐	
HSC/HSA	☐	
HIFI ICC	☐	
PACS ICC	☐	
SPIRE ICC	☐	
NHSC	☐	
Comp.Supp.	☐	
Test COORD.	☐	

NB: Any of the below timeline sections could simply involve the statement : Follows baseline plan Ref.nnn

1. Significant events for the next OD
(by Test Coordinator, System Engineer, ICC, Function or NHSC Representatives, as appropriate)
- for the first briefing of any campaign only the Test Coordinator or System Engineer should:
  - overview the first 5 ODs of the campaign
  - recap overall scope & goals of whole campaign

Principally a wrap-up summary and look-ahead by the Test Coordinator.

Delta-briefing (n+1):

Any additional points arising overnight

- HSC
- HIFI
- PACS
- SPIRE
- NHSC

14. APPENDIX II – Template for reporting SIMS Tests or Activities

One of the limitations observed in the SIMS #1 campaign was the lack of systematic reporting of testing and activities carried out. Given that the campaign suffered initially from continuous problems that greatly reduced its utility for systematic testing of procedures, this lack was ultimately not a grave issue. However, for SIMS #2 full reporting activities will be instituted using the template form below.

HSC SIMS #2 Campaign
Test or activity report

Tester(s)	
Date	**Time start (if applicable)** **Time end**
Module used	
Description of planned activity & procedure(s) used	

Result(s):

Declare activity success or failure:

15. APPENDIX III – HSC TEAM ROSTER FOR SIMS-2

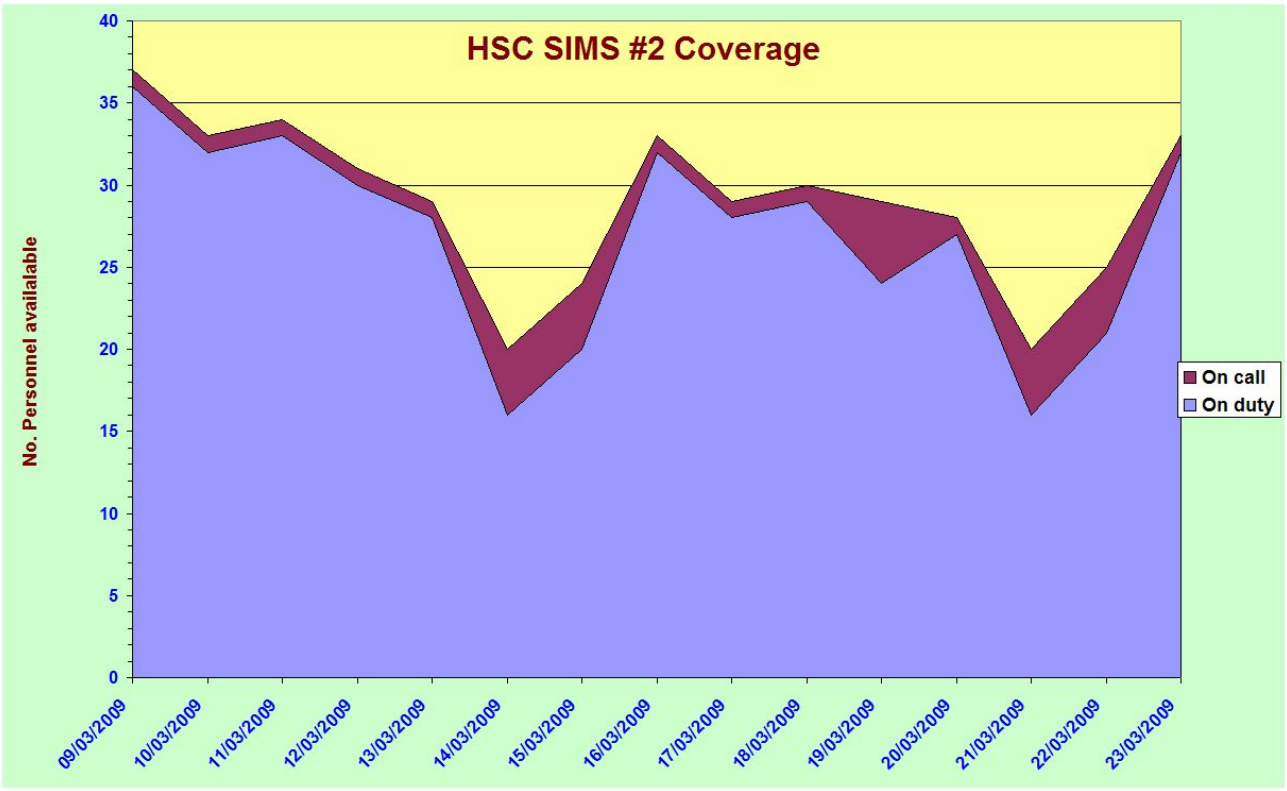
The team roster, as of March 9th, is as below.

Version: 09/03/2009	09/03	10/03	11/03	12/03	13/03	14/03	15/03	16/03	17/03	18/03	19/03	20/03	21/03	22/03	23/03
Leo Metcalfe	x	x	x	x	x	x	x	x			x	x	x	x	x
Larry O'Rourke	x	x	x	x	x	O	O	x	x	x	O	x	O	O	x
Mark Kidger	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
Jon Brumfitt	x	O	O	x	x	x			x	x	x	x	x		
Rafael Andrés	x	x	x	x	x	x	x	x			x	x	x	x	
Pedro Gómez	x	x			x	x	x	x	x			x	x	x	x
Daniel Galán							x	x	x	x			x	x	x
Antonio Villacorta	x	x	x	x			x	x	x	x	x			x	x
Paolo Pesciullesi	x	x	x	x	x			x	x	x	x	x			x
Pedro García Lario	x		x	x	x	x	x	x	x	x	x	x			x
Eva Verdugo	x	x	x	x	x	O	O	x	x	x	O	x	O	O	x
Rosario Lorente	x	x	x	x	x			x	x	x	O	x	x	x	x
Álvaro Llorente	x	x	x	x	x	x	O	x	x	x					x
Fernando Rodríguez	x		x	x	x	O		x		x	x	x	O	x	x
Mar Sierra		x	x	x	x		x		x	x	O	x	x	O	x
Jean Matagne	x	x	x	x	x			x	x	x					x
Anthony Marston	x	x	x	x	x			M	M	M	x	x	x	x	x
Roland Vavrek	x	x	x	x	M					x	x	x	x	x	x
Bruno Altieri	x	x	x		x	x	x	x	x	x				x	x
Ivan Valtchanov	x	x	x	x			x	x		M	M	M	M	M	M
Luca Conversi	x	M	M	M	M			x	x	x	x	x			M
Miguel Sánchez	x	x	x			x	x	x	x	x	x	x			x
Bruno Merín	x	x	x	x	x			M	M	M	x			x	x
David Teyssier															
Jorgo Bakker	x		x	x	x			x	x		x	x	x	x	x
Paul Balm	x	x	x	x	x			x	x	x	x	x			x
Javier Díaz	x	x		x	x	x	x		x	x	x	x			x
José Osinde	x	x	x		x	x	x	x		x	x	x			x
Stephan Ott	x	x	x	x	x			x	x	x	x	x		x	x
Davide Rizzo	x	x	x	x			x	x	x		x	x		x	x
Juan Carlos Segovia	x	x	x	x		x	x	x	x	x	x				x
Jaime Sanz	x	x	x	x	x			x	x	x			x	x	x
Thanos Tsounis	x	x	x	x			x	x	x	x			x	x	x
Asier Abreu	x	x	x		x			x	x	x		x	x	x	x
Javier Arenas	x		x	x	x	x	x	x		x	x	x			x
Daniela Coia	x	x		x	x	x	x	x			x	x	x	x	
Beatríz González	x	x	x			x	x	x	x	x	x			x	x
Julio Rodríguez	x	x	x	x	x			x	x	x	x	x	x	x	
Michael Clayton	x	x	x	x	x	x	x	x	x	x		x			x
Timothy Lock	O	O	O	O	O			O	O	O		O			O
Hugo Costa						O									
Nicolas Fajersztejn							O								
Javier Castellanos											O		O	O	
On duty	36	31	32	30	28	16	20	32	28	29	24	27	16	21	32
On call	1	2	2	1	1	4	4	1	1	1	5	1	4	4	1

Note that Thursday March 19th (shown in green) is a Bank Holiday at ESAC.

The last three names on the list are the members of the Satellite Archives and Virtual Observatory Team who

will provide supporting weekend cover.



Level of coverage by HSC Personnel during SIMS #2.

Ideally we would expect to see an even level of coverage through the SIMS #2 campaign. In reality we see a quite inhomogeneous distribution with a peak each Monday, ramping down through the week to a minimum on Saturday. This may simply reflect the expected level of coverage during the PV Phase of the Herschel mission that HSC Team Leaders foresee.