



Herschel Observation Planning Tool (HSpot) Changes in HSpot 5.2

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Chapter 1. Introduction

HSpot is a complex and evolving system to which improvements are being made through a series of planned new releases at key dates in the Herschel schedule. Many of these changes are essentially invisible to the vast majority of users (additional specialist functionality used only by the HSC or the expert users at the ICCs, cosmetic improvements, changes to the Spot core, improved characterisation of instruments, bug fixes, proposal handling changes, etc.), some though may have a significant impact on all users, particularly those related to time estimation.

The purpose of this document is to give a guide to the main changes that have been made in the Astronomical Observing Templates (AOTs) for each instrument since the release of the final user version for the 2010 Call for Proposals was made (HSpot v5.0). HSpot users who have prepared previously observations with HSpot should be aware that there are numerous changes that will affect already prepared Astronomical Observation Requests (AORs); these are detailed in this document. Time estimates that were previously prepared with HSpot v5.0 may be out of date and must always be re-calculated, although the differences are usually small. Even when time estimates do not change, there are important underlying differences in the software that make a real difference to how the observations are executed on board, so even apparently neutral time estimator changes may be very important for your data. Since launch there have been regular changes in the software that controls the AOTs, with frequent changes of software version (Mission Configuration); each Mission Configuration links to a new time estimator version; while time estimation is now more stable as better knowledge of the instruments is available, there is a constant tweaking of the way that observations are taken to optimise data quality.

Users are strongly recommended to read this document in conjunction with the relevant Observers' Manuals and the [HSpot Users' Guide](#).

1.1. A note on changes made between HSpot v5.0 and v5.2

HSpot 5.2 is our routine operations version of HSpot for Phase 2 the OT1 Call for Proposals. A further slough of changes have been made to HSpot relative to the final Science Demonstration Phase version (4.4.4) to take into account the frequently major changes in the way that observations are carried out in flight compared to the pre-launch version. Science Demonstration Phase and early Routine Operations showed that some observing modes needed to be radically re-designed to optimise them and also showed the need for new, second-generation observing modes in some cases. At the same time, updates have been made in the Spot Core that have been incorporated in these releases. There have been several intermediate releases that astronomers did not see; often these patch specific functionality needed by the instruments in their Expert User mode that may have no impact on the astronomer save to give him a better understood and calibrated instrument and to allow the HSC to test changes in the code thoroughly before the are released to users. Many of the changes in these intermediate versions affect only the software specific to the HSC and ICCs such as the Mission Planning System, or the proposal processing, which the proposer will never see.

The 5.2 version of HSpot involves many changes. No less than 25 problems are fixed, or updates applied by HSpot 5.2.1 relative HSpot 4.4.4. Most were fairly small changes were required to bring HSpot in-line with in-flight reality, as the modification, or deprecation, or inclusion of observing modes requires other, related changes in HSpot. Some of the changes have been relatively complex to implement and have required iteration over intermediate versions to ensure that they are correct.

No attempt is made to describe every single HSpot change. Here we describe only the major changes that will have a significant effect on the way HSpot works or that will be obvious to the user.

Since the 4.4.4 release, the pre-launch method of functioning has become inadequate. Members of the HSC Instrument and Calibration Scientist Team are deeply involved in testing and quality control and have less time available for pure documentation, hence listings are given of the relevant bugs patched (System Problem Reports, or SPRs) and changes made (System Change Requests, or SCRs) tracked by the HSC rather than an analysis of changes. The ones reproduced and commented

in this document are just a small part of the fixes and updates that are routinely made on the system.

For each change, the problem or change request number is given (prefixed by "PHS-SxR" to say that it was raised on the Proposal Handling System), the title of the Bug Report or Software Change Request and brief details of its resolution and effects on HSpot.

Chapter 2. General HSpot updates:

This section describes the main updates to HSpot, relevant to all users, which have been made since the release of the updated version for the Open Time Call (OT1) was made (HSpot v5.1). Users are strongly recommended to read this document in conjunction with the [HSpot Users' Guide](#).

2.1. General changes

2.1.1. A note on the upgrade to HSpot 5.2.3

An update has been made to the Versant database manager at HSC, including recent patches to the system. This has required a new operational release of HSpot to link to the modified databases. There should be no visible effect at all for users. No other changes have been made in this version of HSpot.

2.1.2. Other recent changes

- [PHS-1556] Title of HSpot 5.2.x main window and Proposal Submission Tool window should refer to "OT1 Call Phase 2 Version"
 - [PHS-1562] Please update Help for HSpot 5.2 user release.
 - [PHS-1560] Minor update to Tip of the Day to keep the information up to date.
 - [PHS-1564] Further updates to HSpot on-line Help
 - [PHS-1579] Small change to HSpot Help to reflect the changes in overhead calculation for dithered maps.
- Effect:** Updates to the online documentation on HSpot to keep it in line with the latest changes.

2.1.3. Other changes

- [PHS-1520] CLONE -Concatenating dithered observations should have no penalization
 - Implication for user: This has an important impact on dithered maps with SPIRE as, previously, HSpot was adding a slew overhead to each AOR when scan maps were dithered to sample them better. The new implementation of overhead calculation removes this penalisation for taking better maps.
- [PHS-1577] Wrong computation of overheads?
 - Implication for user: Similar to [PHS-1520]. For dithered maps with PACS no overhead will be applied for scan legs with centres that are separated by less than 3 arcminutes.
- The Spot Core version incorporated into HSpot 5.2 is now 18.9.19, while HSpot 5.0.4 had 18.9.17. The Spot Core has thus advanced two versions since HSpot 5.0.4.
 - Implication for user: There are some small changes in the appearance of HSpot as well as new, or modified options. New text and screen shots have been incorporated into the HSpot Manual, where required.
- [PHS-1546] HSpot does not take into account explicit time constraints when calculating AOR visibility.
 - Implication for user: When a time constraint has been added to an AOR HSpot will now show

the correct, time-constrained visibility for the observation.

- [PHS-95] HSpot4.1: AOR overlay does not update the visibility windows.
 - Implication for user: This is an old bug whereby if a constraint is added to an AOR and then the AOR is overlaid on an image, the overlay does not update if the constraint is then modified or removed.

Chapter 3. PACS-related HSpot updates:

This section describes the main updates to HSpot that are relevant to PACS users that have been made since the release of the updated version for the OT1 Call was made (HSpot v5.1). PACS users are strongly recommended to read this document in conjunction with the [PACS Observers' Manual](#) and the [HSpot Users' Guide](#).

3.1. Most recent changes

- [PHS-1543] Enable HSPOT line flux estimate fields for PACS SED modes.

Effect: Users can now define line flux estimates in HSpot. This allows the proper capacitance to be defined when acquiring the observation. This is particularly important for very bright and very faint targets.

- [PHS-1571] PACS Line Spectroscopy AOR cannot be read in HSpot 5.2.

[PHS-1482] PACS mapping with unchopped grating scan AOR parameters are reset when they are read in a new HSpot session.

[PHS-1488] PACS Line/Range Spectroscopy front ends: change line flux upper limit.

[PHS-1576] Enable HSPOT line width and line width unit fields for PACS SED modes.

Effect: The patching of four bugs that affect PACS spectroscopy users.

Chapter 4. SPIRE-related HSpot updates:

This section describes the main updates to HSpot, relevant to SPIRE users, which have been made since the release of the updated version updated version for the OT1 Call was made was made (HSpot v5.1). SPIRE users are strongly recommended to read this document in conjunction with the [SPIRE Observers' Manual](#) and the [HSpot Users' Guide](#).

4.1. Most recent changes

- [PHS-1473] Change the limit on penalizing SPIRE concatenated dithered observation.

Effect: Previously, when SPIRE observations were concatenated in a dithering pattern, a slew overhead was charged for the different positions. HSpot now recognises these as a single observation if the offset is less than 3 arcminutes rather than the previous 15 arcseconds.

Chapter 5. HIFI-related HSpot updates:

This section describes the main updates to HSpot that have been made, which are relevant to HIFI users, implemented since the release of the updated version for the OT1 Call was made (HSpot v5.1). HIFI users are strongly recommended to read this document in conjunction with the [HIFI Observers' Manual](#) and the [HSpot Users' Guide](#).

5.1. Most recent changes

- [PHS-1512] Default HSpot line tables contain many incorrect LSR frequencies/wavelengths.
Effect: The patching of this bug has obvious benefits to anyone using the default line lists.
- [PHS-1549] Wrong band edges in band 1a when default GUI open in HIFI point or mapping AOTs.
Effect: There was a problem when using the default settings without editing them.
- [PHS-1528] Remove pop up window asking whether LO frequency should be changed or not.
Effect: The redshift correction is now applied automatically to ensure correct centring and thus to stop lines falling out of the window when an LO change is made.
- [PHS-1534] Re-enable HIFI DBS-X mode.
Effect: This mode was temporarily disabled while it was undergoing an extensive re-design. It is now available again.
- [PHS-1524] Target LSR vs SSB velocity not correctly taken into account in some cases.
Effect: In some cases the redshift needed to correct the wavelength to the Local System of Rest was read as zero even when correctly defined in the target list.
- [PHS-1362] Spectral Survey Message
Effect: The message that sometimes appeared when selecting a Spectral Survey AOR, advising erroneously that only the WBS is used in this mode has been removed.

Chapter 6. SPIRE PACS Parallel Mode-related HSpot updates:

This section describes the main updates to HSpot that have been made, which are relevant to SPIRE PACS Parallel Mode users, implemented since the release of the updated version for the OT1 Call was made (HSpot v5.1). Parallel mode users are strongly recommended to read this document in conjunction with the [SPIRE PACS Parallel Mode Observers' Manual](#) and the [HSpot Users' Guide](#).

6.1. General changes to SPIRE PACS Parallel Mode AOTs

- There are no significant changes to this observing mode in HSpot 5.2.