HERSCHEL SPACE OBSERVATORY

Herschel Observation Planning Tool (HSpot): Changes in HSpot 6.x

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Chapter 1. Introduction

HSpot is a complex and evolving system to which constant improvements have been made through a series of planned new releases at key dates in the Herschel schedule. Many of these changes have been 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 have had 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 HSpot since the release of the final Phase 2 version for the OT2 Call for Proposals was made (HSpot v5.3.2).

HSpot users who have prepared previously observations with HSpot were well aware that there were numerous changes that affected already prepared Astronomical Observation Requests (AORs) between the 5.2 and 5.3 versions of HSpot. However, between the 5.3.2 version and 6.0.0, although many updates were made, few of these directly affected observers in obvious ways. Observing modes have been extremely stable during most of the mission, with changes now limited to fine tuning that affects very few observations. Time estimates that were previously prepared with earlier HSpot versions will show in red as out of date and must always be re-calculated, although any differences are invariably small and limited to a handful of AORs. 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 stable with good knowledge of the instruments available, there is a constant tweaking of the way that observations are taken to optimise data quality where changes are found that would be beneficial. **This process is continuing right through to helium exhaustion**.

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 v5.3.2 and v6.x

HSpot 6.x is our routine operations version of HSpot for scheduling observations from the OT2 Call for Proposals and through to end of helium, although there may possibly be a final, incremental update of HSpot for post-Operations. A further slough of changes have been made to HSpot relative to the final OT1 Call version (5.3.2). There has been a careful optimisation of the newer, second-generation observing modes. At the same time, some updates have been made in the Spot Core that have been incorporated in these releases. Between versions 5.2 and 6.0 there were numerous 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. This has continued through HSpot 6.3.0. 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, but which are essential to the success of observations.

Between the 5.3.1 version of HSpot and 5.2.3 no less than 27 problems were fixed, or updates applied. 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 were relatively complex to implement and required interation over intermediate versions to ensure that they are correct. HSpot 6.0.0 incorporated 14 further updates, with smaller numbers in later versions as observing modes became stable, robust and thoroughly flight-tested.

Increasingly though, as HSpot is used on operating systems far more modern than the ones for which it was designed and with multiple platforms that were not even contemplated at Herschel's launch, platorm-dependent problems are appearing (e.g. we cannot hope to support and Acceptance Test HSpot with every flavour of Linux, so have to take the most common ones as indicative of the behaviour of HSpot with the rest). Most of these are minor and have affected few users, others have been more widespread and extremely challenging to resolve.

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

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, "HCSS" that it was raised on the Herschel Common Software 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 final version version for Phase 2 of the Open Time Call (OT1) was made (HSpot v5.3.2). 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 6.3.0

HSpot 6.3.x represents mainly further incremental changes over HSpot 6.2.0 and another round of fine tuning. The biggest change from a user's point of view in HSpot 6.x has been a major update of associated documentation. Most of the changes are related to in-house proposal handling and observational scheduling issues; these are background issues that the astronomer does not see and are hence not documented here. The changes listed are all the changes relevant to users in the different HSpot 6.x releases.

2.1.2. Main changes

- [PHS-1752] No visibility windows for Solar System Objects after 2013 April 20.

  - Implication for user: As estimates of the helium lifetime have extended, the margin between the expected end of helium and the end of ephemerids for Solar System Objects and the expected end of helium has meant that there was almost no margin between the two dates and that no visibility windows could be calculated for targets with visibility that was only marginally past the most likely date for end of helium. The ephemerids have been extended to 2013 July 31 so that visibility windows can be calculated until then.

- [PHS-1737] HSPOT GUI fails to start up correctly (New installer).

  [PHS-1738] HSpot installer will not install on some versions of linux (New installer).

  - Implication for user: These two patches fix a series of problems that some users were having using Linux on different platforms, particularly recent releases. Either HSpot refused to install completely, or would install, but would crash on start-up. These issues have been fixed by changing the HSpot installer. HSpot should now install and run correctly on all common flavours of Linux.

- [PHS-1760] Background calculation fails for SSOs

  - Implication for user: As the helium has lasted longer than was envisiged we found that certain applications within HSpot were failing for Solar System Objects as the ephemerids that they use for their calculations were ending before the likely end of helium. The ephemerids hosted at IPAC that were used for background calculations have been extended well beyond the likely end of helium so that even if the estimate of remaining helium is significantly in error it will still be possible to carry out a full background analysis.

- [PHS-1698] HSPOT icons appear garbled when run under new Mac OSX operating system (LION).

  - Implication for user: This is one of the muliple minor issues that has appeared with new versions of operating systems due to incompatibilities that have appeared since HSpot was developed initially.

- [PHS-1755] Query errors when searching for catalogues in Vizier.

  - Implication for user: This bug was due to a change in configuration outside HSpot and meant

that HSpot options using Vizier catalogues were failing suddenly. Full functionality has now been restored.

- [PHS-1679] Overlay AORs from HROST on HSpot images (also the non-scheduled ones).

  - Implication for user: Users can now overlay any observation from the Herschel Reserved Observation list on an image, whether or not that observation has been scheduled already.

- [PHS-1590] Add capability to save an image + overlays as FITS.

  - Implication for user: Users can now save an image by overlay as a FITS file and not just as a one-dimensional image file (e.g. jpg).

- [PHS-1658] Unable to print the cover sheet of a proposal in HSpot.

  - Implication for user: A small incompatibility blocked this functionality, which is now restored.

- [PHS-1666] HSPOT fails in plotting SSO path for a date close to a turning point of a beginning retrograde motion.

  - Implication for user: HSpot would give an error when plotting a path if an Solar System Object was very close to its stationary point and starting to retrograde. This was a rarely-encountered interpolation problem and has been resolved now.

- [PHS-1580] HSpot should be able to deal with deprecated mode without crashing.

  [PHS-1639] Missing constraints in an xml should be acceptable when loading AORs.

  [PHS-1661] HSpot should be able to load only part of an AOR file when problematic AORs are found.

  - Implication for user: HSpot was very ungraceful in handling old AOR files which contained AORs using now-deprecated observing modes, or AORs with out of date parameters. Instead of crashing, it now gives a warning and does not load the deprecated or problematic AORs while loading the valid AORs correctly.

- [PHS-14] HSPOT fits reader does not follow FITS standards for images.

  - Implication for user: HSpot now follows FITs standard.

- [PHS-1756] Small updates are required to HSpot Help.

  - Implication for user: Further updates have been made in the On-line help to synchronise it with HSpot and to update information. This is the latest in a long series of updates to documentation in HSpot 6.x, some of them major, to keep the on-line documentation up-to-date.

2.1.3. Other changes

- [PHS-1739] New DDT/ToO proposals submitted through HSpot should generate an SMS alert.

  - Implication for user: ToO and DDT proposals that are submitted by the user via HSpot trigger an immediate SMS alert to the Herschel Project Scientist, the On-Call Astronomer and the On-Call Mission Planner. This ensures that urgent ToO and DDT proposals submitted to HSpot out of normal working hours are handled more rapidly than when only an e-mail alert is generated that may be missed out of normal working hours.

- [PHS-1711] Upgrade spot-common library to 19.9.3.

  [PHS-1719] Upgrade spot-common library to 19.9.5.

- Implication for user: Updates to the spot-common library update functionality of HSpot that is provided by the Spot Core (i.e. hard-wired). These are minor upgrades to resolve specific, small issues.

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 final version for Phase 2 OT1 Call was made (HSpot v5.3.2). 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-1733] Depth of coverage map fails in HSpot 6.1.0 Beta 5 over HCSS 8.0.2.

  Effect: Depth of coverage maps failed to generate due to a change in the version of some associated code. This has now been corrected.

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 final version for Phase 2 OT1 Call was made (HSpot v5.3.2). 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-1422] Remove SPIRE Spectrometer dead detectors from the AOR overlay.

  Effect: Self-explanatory.

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 final version for Phase 2 OT1 Call was made (HSpot v5.3.2). 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

- [HCSS-14970] HIFI time estimation fails with HSpot 6.1.0 on HCSS 8.0.0.

  Effect: Time estimation could fail in some exceptional cases due to underlying changes in the code called by time estimation. This has now been corrected.

- [PHS-1642] Synchronize spur table with latest hardware investigations.

  [PHS-1702] Update spurtable for OT2 Phase-2.

  [PHS-1725] Spurtable update for IF saturation: OT2 phase2.

  Effect: These update continuously information on HIFI spurs in the light of the most recent operational knowledge.

- [PHS-1683] Retire DBS Cross Map from HIFI Observing Modes in Public HSpot.

  Effect: This observing mode is no longer offered to users.

- [PHS-1515] Case-sensitive test for Frame parameter prevents old AORs from loading.

  Effect: The frame for observing parameters had to be in the correct case or HSpot would refuse to load AORs unless the file was edited manually This has now been corrected.

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 final version for Phase 2 OT1 Call was made (HSpot v5.3.2). 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

- [PHS-1697] HSpot: limit of Parallel Mode observations.

  Effect: Post-launch changes have very slightly modified the maximum permitted area for a Parallel Mode map meaning that a few old AORs give time estimation errors.