HERSCHEL SPACE OBSERVATORY

Herschel Observation Planning Tool (HSpot) Changes in HSpot 6.0

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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 Phase 2 version for the OT2 Call for Proposals was made (HSpot v5.3.2).

HSpot users who have prepared previously observations with HSpot will be 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 have been made, few of these will directly affect observers in obvious ways. Observing modes are now quite stable, with changes now mainly being made in more specialist observing modes. Time estimates that were previously prepared with HSpot v5.0 are likely to be out of date and must always be re-calculated, although the differences are usually small.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 stable with good knowledge of the instruments 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 v5.3 and v6.0

HSpot 6.0 is our routine operations version of HSpot for the OT2 Call for Proposals. 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 have been 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. 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 incorporates some 14 further updates.

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), 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 6.0.0

HSpot 6.0.x represents mainly incremental changes over HSpot 5.3.2 and fine tuning. The biggest change from a user's point of view is some optimisation, particularly of second generation observing modes and some fine-tuning of particularly HIFI and PACS spectroscopy modes and well as a major update of associated documentation.

2.1.2. Main changes

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

  - Implication for user: This patch fixes a bug whereby the HSPOT fits reader could not deal with Herschel images which followed the FITS standard. As a consequence, it would discard extensions without data and so remove the WCS information, causing the image to be displayed without spatial or flux information. With this patch, images now display correctly.

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

  - Implication for user: This bug affected observers preparing observations of SSOs. The interpolation routine used was unable to deal with a change of sign in the direction of motion in R.A.

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

  - Implication for user: This bug was important for some observers who have observations in old, deprecated modes in their AOR files that cannot be read back in without HSpot crashing, meaning that such files could only be edited by hand.

  This is related to two other issues that have also been fixed:

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

  - Implication for user: This bug is only important when manipulating AOR files that have been edited to contain only the unscheduled observations of a larger dataset. If there are constraints such as follow-ons for which only part of the follow-on has been observed, HSpot would refuse to load the AOR file. Now, HSpot will skip the conflictive observations.

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

  - Implication for user: Similar in its implications to the previous two reports and self-explanatory.

- [PHS-1600] Overlay AORs from HROST on HSpot images.

  - Implication for user: This is an additional functionality to help users with duplication checking. For any target you can overlay AORs from HROST on an image to see what observations have been made of and around the target. You may then consult the data for any plotted observation in the database to see whether or not it duplicates your intended science and, if the observation

has already been executed, the execution details.

- [PHS-1496] Duplicating existing aors and saving in a new file produce a corrupted aor file.
  - Implication for user: On some occasions the process of duplicating AORs could produce a corrupted and unreadable output. This is now fixed.

- [PHS-1640] Yet more updates to HSpot Help.
  - Implication for user: Significant updates have been made in the On-line help to synchronise it with HSpot and to update information.

2.1.3. Other changes

- [PHS-1658] Unable to print the cover sheet of a proposal in HSpot
  - Implication for user: This option would fail in some circumstances due to an external configuration error. This option has been replaced with an option to print all or part of the proposal documentation as a PDF file.

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

- There have been no significant changes between HSpot 5.3.2 and HSpot 6.0.0.

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

- There are no significant changes in HSpot 6.0.0 relative to HSpot 5.3.2.

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

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

  Effect: When defining an AOR HIFI requires you to define a system of reference as "LSR", "Heliocentric", or "Geocentric". In old AORs these values are stored as lower case. HSpot's case sensitive reference frame test (introduced to ensure that this parameter had been updated correctly for new observations) was stopping some observers from reading back in their own AORs.

- [PHS-1637] Improper treatment of velocity shifts to an existing frequency setting.

  Effect: There was a problem when adding a red shift to an observation that was defined with a set Local Oscillator frequency.

- [PHS-1611] Dynamically add line tick on frequency editor when frequency is chosen by manual entry.

  Effect: A minor update to the frequency editor graphics as an aid when preparing AORs.

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

- There are no significant changes in HSpot 6.0.0 relative to HSpot 5.3.2.