

HERSCHEL USERS GROUP

MINUTES OF SEVENTH MEETING ESTEC, 14 OCTOBER 2013

Members attending: M. Barlow, L. Decin, D. Elbaz, E. Falgarone, P. Hartogh, L. Hunt, C. Kramer, M. Meixner, A. Noriega-Crespo, D. Rigopoulou (chair), G. Stacey, A. Weiss (telecon)

HSC Staff attending: G. Pilbratt, P. Garcia-Lario, A. Marston, B. Merin, E. Verdugo

SUMMARY

The 7th Herschel Users Group (HUG) meeting was the first meeting to take place, after the end-of-Helium, in the so-called “post-operations” phase of the Herschel mission. The meeting was devoted to a detailed discussion of the products and functionalities of the Herschel Science Archive (HSA). Following the HUG recommendations on archival products and functionalities that formed part of the minutes of the 6th HUG meeting, the Herschel Science Centre (HSC) provided feedback on whether their implementation was feasible/realistic.

In the post-operations era, the focus of the HUG has naturally shifted towards ensuring that the final products that are/will become available in the HSA are of the highest possible standards but also that the accompanying tools will meet the needs of astronomers for years to come. The HUG would like to see the HSA become the most popular archive for the astronomical community which is entering the era of ALMA.

The salient points from the meeting are as follows:

1. Herschel Science Archive Products

After discussion with the HSC and taking into consideration manpower and resources available, the HUG considers top priority the immediate availability in the HSA of the following products:

1.1 SPIRE:

1.1.1 SPIRE-P: A standalone FITS file that contains three extensions: The standard pipeline (SPG) Level 2 product, the RMS map and the S/N map (all in FITS format). The coordinates of the RMS map should be Equatorial. In addition, the appropriate most recently measured beam size and relevant information on how the image was calibrated should be given in the header. There should be one of these ‘standalone’ products for each SPIRE band.

1.1.2 SPIRE-S: A standalone 1-D spectrum file should be made available using a point source calibration (in any format FITS or ASCII), one for the central SLW detector and one for the central SSW detector. All repeats in each AOR should be co-added. In addition, a FITS file should be made available containing the spectra from all the detectors, calibrated using an 'extended source' calibration.

1.2 PACS:

1.2.1 PACS-P: A standalone FITS file that contains three extensions: The standard pipeline (SPG) Level 2.5 product (i.e. the combination of orthogonal scans), the RMS map and, S/N map (all in FITS format). The coordinates of these two products should be in the same units as the main data product. One such 'standalone' product should be made available for each PACS band.

1.2.2 PACS-S: A standalone data cube in FITS format containing spectral data from a central 3x3 spaxel extraction producing a single calibrated spectrum for point sources (in either ascii or FITS format). If scans of more than one line were carried out then a FITS file should exist and correspond to each line scan, wavelength range scan or SED-range spectral segment (for instance scans containing spectra of the second order should have their own fits file). All repeats in an AOR should be co-added.

1.3 HIFI:

1.3.1 It would be highly desirable to make products (Level 2) available in formats other than the standard HIPE format (e.g. CLASS). The HUG is aware that the CLASS-compatible FITS files do not contain the full header information available in the standard pipeline (SPG) products. For many users however, the CLASS headers may be sufficient, and in any case the SPG products remain available. The HUG considers that the availability of the data in another format that is widely used in the astronomical community is very important.

1.3.2 It would be beneficial to many users if co-added cubes of both polarisations (H,V) could be offered as SPG products. The small offsets of the HIFI beams between H/V for the different bands (a typical example of instrument specific information) could be documented in the HIPE-generated headers.

The view of the HUG is that the standard pipeline (SPG) products in the archive (available as a tarball) although all-inclusive might pose a challenge for those archive users that are unfamiliar with the structure of HIPE files. It must be noted that the recommendations **are not intended to replace the products currently available but should be offered in the HSA in addition to the standard pipeline (SPG) products. The HUG stresses that SPG products must remain unchanged.**

2. Mappers Report

The HUG was impressed with the reports on comparisons of the Map-Makers for SPIRE-P and PACS-P. While the various SPIRE-P mappers perform there is scope for improvement of the final product in the case of PACS-P. The HUG would like to encourage the PACS-

ICC together with the HSC to make a swift decision on the best way forward for mapping observations with PACS-P.

3. HUG Survey

The HUG will carry out a survey to canvass the community's experience using the HSA. Given that a new version of the archive (HSA 5.2) is expected to become available by the end of the year, the HUG has decided to carry out the survey in early 2014.

1. INTRODUCTION

The Herschel Users' Group (HUG) held its seventh meeting at ESTEC on October 14th 2013. The format of the 7th meeting was slightly different than previous ones both in duration and focus. The meeting was devoted to discussing the specific feedback received from the HSC and the ICC teams on the HUG recommendation on archival products. As has been stressed in the past with the end of the "active" data collecting phase of the Herschel mission, the focus naturally shifts to matters related to the HSA and in particular on the data products available and the ease and accessibility of the archive. The HUG recognises that resources, as well as manpower, are limited within the HSC and the instrument teams, hence, prioritisation is imperative.

There was only one presentation from the Project Scientist and this can be found on the HUG web pages <http://herschel.esac.esa.int/HUG.shtml>

2. HERSCHEL SCIENCE ARCHIVE (HSA)

With the end of Herschel's active (data collecting) phase of the mission the Science Archive becomes the focus of the Herschel Legacy. The HSC has already invested in manpower and technology to develop a system that will serve the needs of the astronomical community in the years to come. The HSA has been fully operational and will continue to be the main provider of Herschel products during Herschel Post-Operations and beyond ensuring the lasting value of the Herschel Legacy. With that in mind, the HUG made a number of recommendations (which can be found in the minutes of the HUG#6 meeting) for archival products and functionalities. The minutes/recommendations were made available in July 2013 and following that the HSC and the ICC teams have considered the suggestions made by the HUG.

The recent HUG#7 meeting was devoted to discussing the feedback provided by the HSC and the ICC teams as to which of the HUG recommendations are feasible/easy to implement and associated timescales. Although all HUG recommendations were deemed as feasible and realistic not all of them can/will be implemented.

Items 1.1.1 through 1.3.2 (which can be found in pages 1 & 2 of this document) outline what the HUG considers as immediate priority for implementation in the HSA as soon as possible.

In particular, the HUG considers that having a number of 'standalone' products for each instrument/observing mode will be tremendously beneficial for the wider astronomical community that is not necessarily familiar with the specifics of the Herschel mission and its suite of instruments. As has been stressed in the past, these 'standalone' products should not, in any way, be seen as products that should replace the SGP which are also available in the HSA.

In addition to these top priorities the HUG suggests that:

1) Making files available in ASCII format (this is particularly relevant to data from **PACS-S** and **SPIRE-S**) would be beneficial for quick look purposes. Although the HUG appreciates the argument on the VO compatibility that should be adhered to by Herschel archive products, VO tables are capable of handling ASCII formats (e.g., IPAC tables, http://irsa.ipac.caltech.edu/applications/DDGEN/Doc/ipac_tbl.html).

2) **For HIFI** : The HIFI team had a scheduled ICC team meeting the week following the 7th HUG meeting to discuss the recommendations. The initial feedback from the team noted that although the recommendations were realistic they would not all be considered for implementation. The HUG notes that availability of CLASS compatible products should be an immediate priority. The HUG recognises that additional work is needed for this to be implemented and appreciates the team's efforts in constantly improving their products. However, CLASS products are rather popular among the heterodyne astronomical community and the HUG view is that they will attract more users in the archive.

3. INSTRUMENT SPECIFIC ISSUES

SPIRE-P: the details of the new flux calibration scheme (beam-sizes and colour corrections used) should be stored (if possible) in the fits header of the file. The paper outlining the methodology followed should be clearly linked from the current SPIRE Observer's manual and from within HIPE if possible.

PACS-S: it would be beneficial to users for the FITS header of PACS-S files to be shorter and they various keywords grouped according to functionalities. The current layout of the FITS header is too long with vital information being hard to recover especially by novice users.

4. MAP-MAKING REPORTS

The HUG received draft copies of the map-making reports from the SPIRE-P and PACS-P teams. The HUG was very impressed with the extensive testing of the various map-making tools and wishes to congratulate the instrument teams for their efforts in producing such detailed and highly informative reports.

SPIRE-P: The HUG felt that there are no major issues for the SPIRE-P mappers however, the results of the report should be made available to the community.

PACS-P: The situation is slightly different for the PACS-P mappers. Extensive testing and comparison of the outputs indicates that perhaps there is scope for improvement in the quality of the final PACS-P products. Although the report makes no recommendations with respect to any of the mappers reviewed, the HUG strongly encourages the PACS team (in consultation with the HSC) to compile a list of recommendations for users according to the specific needs of their project (e.g. deep imaging/points/sources vs. extended emission). Should the conclusion of the testing of the various PACS-P mappers result in altering the currently available mapper within HIPE then the HUG recommends that the change be implemented as soon as possible.

6. COMMUNITY SUPPORT AND COMMUNICATIONS WITH USERS

A number of brief updates on various aspects of User Support were presented and briefly summarized. A new version of the Archive (HSA v. 5.2) is foreseen for release towards the end of the year. The HUG acknowledges the efforts of the HSC Archival team and their continued work on improving various functionalities of the archive.

The HSA is now accessible through the Vizier and Simbad databases which will certainly improve its visibility. The HSC is in contact with the ALMA-ARCs with the aim to enhance the visibility of the HSA among the ALMA community.

The HUG welcomes HSC plans to organize a specialized workshop focusing on issues related to spectroscopy. The workshop will take place in early 2014. The HUG recommends that the workshop should focus on outstanding issues of data reduction with PACS-S and SPIRE-S (especially in the case of extended emission or mapping) and HIFI (outstanding issues with data reduction).

In addition, HSC will continue with their successful series of workshops for newcomers as well as various webinars related to more specialized topics.

9. HUG MATTERS

The HUG will continue its mission during POP and will endeavour to advise the Project Scientist and the HSC on matters relevant to Herschel users. The frequency of the HUG meetings will drop to once per year or more if necessary. The HUG will make an effort to coordinate its meetings with the HST meetings – with the HUG ones preceding the HST ones. This scheme will likely come into effect after April 2014.

The HUG has decided to carry out a survey of the community's experiences with the HSA. The likely date for the survey will be in February 2014. As with the previous HUG survey, the questionnaire will be decided in consultation with the HSC and the ICC teams.

The date for the next HUG meeting was provisionally set for mid-April 2014.

10. ACKNOWLEDGMENTS AND THANKS

The HUG wishes to thank Göran Pilbratt and the HSC staff for hosting a highly productive and informative meeting.

11. AGENDA OF THE MEETING

Monday Oct 14th 2013

13:00 – 14.30 : HUG closed session

14:30 –15.00 : Presentation from Project Scientist

15:00 – 17:00: Open discussion on HUG recommendations on HSA products

17:00 – 17:30 : brief updates

17:30 – 18:00 : HUG internal matters