



Herschel Reserved Observations List Tool User's Requirements

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1 Introduction

1.1 Purpose and scope

The purpose of this note is to define the User's requirement for the Herschel Reserved Observations List tool (ROL tool) that will be provided to the astronomical community for the Key Programmes Open Time proposal entry that will start on 5 July 2007.

The Reserved Observation List is the list of all approved Astronomical Observation Requests (AORs) that have been entered as part of the phase-2 submission of proposals for the Key Programmes Guaranteed Time. This list is communicated to the astronomical community for information and to avoid the submission of duplicated observations. The ROL contains thousands of AORs; likewise a KP OT proposal may consist of hundreds of AORs that the astronomer may need to check for duplication with reserved observations. With this scenario in mind, a tool will be offered to facilitate to search in the ROL and to display the results of the search in a convenient way. This document describes the user's requirements for the implementation of such a tool.

In addition to the KP OT proposal entry, it is expected that the tool will be used to search the Reserved Observations List during any call for proposals that will be organised for the Herschel Space Observatory in the future.

1.2 Definition of terms

Astronomers prepare and submit Herschel proposals with the Herschel Observation Planning Tool (HSpot). A proposal contains at least one AOR or Astronomical Observation Request. An AOR is the equivalent of "observation" in Herschel terms, and it is the basic unit for the observatory mission planning. AORs can be defined in HSpot for fixed and moving targets. Moving targets are Solar System Objects and fixed targets are any other astronomical source; this is the nomenclature that will be used in this document. Further explanations on AORs and HSpot can be found in [RD-2] and [RD-3]

1.3 Acronyms

AOR Astronomical Observation Request
AOT Astronomical Observation Template
HIFI Heterodyne Instrument for the Far Infrared
KP Key Programmes
NAIF Navigation Ancillary Information Facility



OT Open Time

PACS Photodetector Array Camera and Spectrometer

ROL Reserved Observations List

SPIRE Spectral and Photometric Imaging Receiver

1.4 Reference Documents

RD-1 Announcement of opportunity for Key Programmes: Policies and Procedures, Herschel-HSC-DOC-0888, version 1.1, 2 February 2007

RD-2 Herschel Observer's Manual, Herschel-DOC-0876, version 1.0, 1 February 2007

RD-3 HSpot Users' Guide, Herschel-DOC-0788, version 1.0, 1 February 2007

2 Requirements

HCSS-ROL-010 The user shall be able to search the Reserved Observations List through a Web interface.

HCSS-ROL-020 The parameters to specify a query shall be:

- 1 For fixed targets : Position (RA and Dec), and radius around the specified position.
- 2 For moving targets: NAIF Identification

HCSS-ROL-030 For fixed targets, it shall be possible to enter a file with a list of Positions (RA and Dec) as input for the search.

HCSS-ROL-040 For moving targets, it shall be possible to enter a file with a list of NAIF Ids as input for the search.

HCSS-ROL-050 For moving targets, the AORs in the ROL that match the query will be those with the same NAIF Ids as specified in the search.

HCSS-ROL-060 For fixed targets, the AORs that match a query will be those in which the "AOR sky area" overlaps totally or partially with the circle specified by the user. The "AOR sky area" depends on the AOT and pointing mode, and it is defined as:

HIFI Band radius (arcmin)

b1 0.325

b2 0.250

b3 0.209

b4 0.175

b5 0.159

b6 0.109

b7 0.109 (sic)

SPIRE radius (arcmin)

SPIRE Photometry 4.472



SPIRE Spectroscopy 2.6

PACS radius (arcmin)
PACS Photometry 1.956
PACS Spectroscopy 0.554

For mapping modes the AOR radius is calculated as:
 $\text{radius} = \text{acos}(\cos(\text{xmap}) * \cos(\text{ymap}))$

where xmap, ymap are computed from AOR data (either xsize, ysize or stepsize, separation, numpoints, numlegs). An extra, fixed size is added to both x and y map sizes to take into account largest detector sizes. Currently, the following values are being added to the map sizes (in both x and y directions):

HIFI: 0.75 arcmin
SPIRE and SPIRE/PACS parallel: 4.0 arcmin
PACS: 1.75 arcmin.

HCSS-ROL-070

The AORs in the ROL matching the query shall be displayed in a table, with the following information:

- 1 For fixed targets: Position of target, RA and Dec (for maps this is the center of the map) as given by the AOR
- 2 Target name as appears in the AOR
- 3 For fixed targets: Distance between target and position entered by user
- 4 AOR radius (arcmin)
- 5 Proposal identification
- 6 Instrument
- 7 Observing mode information as given by Hspot. Conversion table from input file to output of the tool is given in Appendix A.
- 8 For moving targets: NAIF Id as given by the AOR

The output of the tool shall also include:

For fixed targets : Position (RA and Dec) and search radius entered by the user.
For moving targets: NAIF Id as entered by the user



3 Appendix A

Conversion table from input file to output of the tool.

Mode	Sub-mode	Output
SpirePhoto	point	Point Source Photometry
SpirePhoto	small	Small Map Photometry
SpirePhoto	large	Large Map Photometry
SpireSpectrometer		Spectroscopy
PacsPhoto	point	Point Source Photometry
PacsPhoto	small	Small Source Photometry
PacsPhoto	largeRaster	Chopped Raster
PacsPhoto	largeScan	Scan Map
PacsLineSpec	point	Line Spectroscopy pointed
PacsLineSpec	dithered	Line Spectroscopy pointed with dither
PacsLineSpec	large	Line Spectroscopy mapping
PacsRangeSpec	point	Range Spectroscopy pointed
PacsRangeSpec	dithered	Range Spectroscopy pointed with dither
PacsRangeSpec	large	Range Spectroscopy mapping
HifiFS	fs-freq	Frequency Switch Spectral Scan
HifiFS	freq	Dual Beam Switch Spectral Scan
HifiPoint	dbb	Single Point Dual Beam Switch
HifiPoint	fs	Single Point Frequency Switch
HifiPoint	pos	Single Point Position Switch
HifiPoint	load	Single Point Load Chop
HifiMapping	fly	On-the-fly Mapping
HifiMapping	raster	DBS Raster Mapping
HifiMapping	cross	DBS Cross Map
HifiMapping	fs-raster	OTF mapping w/Frequency Switch
SpirePacsParallel		Parallel