

## Questions and answers

### IRC Imaging

1. *What is the saturation limit for detectors?*  
In the raw data, the physical limits are 12,500 counts for the NIR and 33,000 for the MIR.
2. *Is there any way to correct for latents?*  
We mask the saturated pixels, but for extended sources you may have to throw it away or it may be possible to use previous observations to correct the current image (e.g. by modeling the decay etc), although the latent decay is still not understood).
3. *How do we know if our observations are affected by latents, is there anything in the headers?*  
The ESA user support team searched and produced a list of observations of bright sources which can be checked with your observations. This only affects the MIR channels. The effect is small and will only affect faint and diffuse images.
4. *Although it is stated that distortion correction is not applied, while running the pipeline, the pipeline lists distortion correction during its processing.*  
The new version of the pipeline no longer corrects for distortion since it is thought to be a negligible effect.
5. *How are cosmic rays replaced ?*  
Cosmic rays are replaced with the median value of the surrounding pixels
6. *Is there an option to detect but not replace cosmic rays?*  
No.
7. *Why would you use avsigclip for even a few images?*  
Indeed the "sigclip" option works best when many image frames are available. else the bad pixels can bias the sigma significantly, since the mean (based on minmax rejection) is used to determine the sigmas. However, the "avsigclip" option work well on even a few image frames. For each line of pixels, the mean is estimated using the minmax rejection and the sigmas at each point in the line are scaled by the square root of the mean. The sigmas are then averaged to get a line estimate of the sigma. Then the sigma at each point in the line is estimated by multiplying the line sigma by the square root of the mean at that point.
8. *Does the scattered light module correct for the time dependent Earthshine?*  
No, it only corrects for the constant scattered light component
9. *In the IRC presentations we are advised to use the self darks supplied with our observations. If this is the case, what is the point of the super-darks ?*  
Note that although the super dark has higher signal to noise, the number of hot pixels has steadily increased throughout the mission. Therefore, the self darks are preferred since they provide a better mapping of the hot pixels although it is of course at the users discretion.
10. *Is there any means to deal with the straylight in the toolkit ?*  
No, not as yet.

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11. *Looking at the raw data, there seems no indication of the filter name, so how do we know which file corresponds to which filter ?*  
In the raw data there are filter.lst files that contain a list of raw data files.  
After running pre-pipeline, the irclog file contains details of the image files and corresponding filter names.
12. *Where is the IRC constants database ?*  
This is located in /where-IRC-is-installed/lib/
13. *Why is 2MASS used for WCS and not other catalogues that may be more appropriate for the MIR bands ?*  
2MASS is used because it is all sky.
14. *Is it possible to process more than one pointed observation with the pipeline in one attempt?*  
Yes, all raw files should be placed in one directory. Then make one working directory and run pre-pipeline and pipeline respectively.
15. *What are the .pl files in the stacked image directory ?*  
These are effectively weight maps but are not currently relevant
16. *Are there any methods or tools to correct for image artifacts / characteristics (e.g. muxbleed, column pull down)*  
Not as yet. Future versions may include corrections.

## IRC Spectroscopy

1. *Is the zero-order light masked out when extracting the spectra?*  
No, the zero-order light (marked as yellow circles in the two dimensional spectroscopy images) are not masked out. The user should verify that there is no contamination in the case where a yellow circle falls on one of their spectra.
2. *Is the background re-subtracted when changing the extraction box width and position in the plotting tool?*  
No, the background is subtracted in an earlier stage and it is not recomputed in the plotting tool.
3. *Is there a possibility of saving the processed spectra in .fits file format?*  
No, in the current version of the pipeline this is not possible, but will be implemented in a future release.
4. *What is the optimal extraction box width?*  
The optimal extraction box width is 3 pixels. Wider boxes introduce more noise and narrower boxes result in aperture corrections that are not appropriate.

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### FIS

1. *How we can confirm the detections of 'faint' sources?*  
Use /scut option to create images from individual scans and compare the results.
2. *ss\_run\_ss only searches for \*.fits.gz and not \*.fits files*  
It is the specification of the software to find the TSD FITS file correctly (and not image FITS files). We will consider this for future releases. For the moment please do not un-gzip the TSD fits file (this also saves your disk space).
3. *The image plot at the end of ss\_run\_ss run does not have proper coordinates. Coordinates were present in the previous version but now they are in pixel coordinates. They should have proper coordinates.*  
We will consider to make the images with proper coordinates.
4. *How much can we rely on the calibration?*  
Brightness of the diffuse radiation on the image should be correct. Point source flux after applying;  
- aperture correction factor  
- point source flux correction factor  
should be correct.  
There is unknown systematic difference between the flux integrated over the image and the point source calibration = point source correction factor. This is not yet well understood but possibly could be a very extended component of the PSF.
5. *Are the aperture correction factors measured on the modeled PSF?*  
At present they are from the calibration standards (asteroids). The curve of growth is very stable for all targets.
6. *Is the PSF circular?*  
No. Many factors contribute to the real PSF. Cross-talk, transients, detector pixel shape, optical aberration, etc. Providing accurate PSF information is an important issue that must be addressed.
7. *Which document should we cite for the FIS calibration?*  
For the moment the IDUM is the source of information. When calibration has been established, a dedicated paper will be issued. A list of official references is provided on the observer's support web page.
8. *What is the absolute accuracy of a pointing?*  
The current Slow-Scan tool corrects the systematic offset of the G-ADS position to boresight position, as well as aberration. According to the analysis of Mission Programme data, the absolute pointing uncertainty is roughly 10 arcsec in the SW band and 20-30 arcsec in the LW band (the large scatter in the LW band comes from position measurements on low-quality images).

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9. *Is the relative position during one pointing accurate?*  
Yes, so if the absolute position is calibrated by a source in the image, it should be applied to the whole image.
10. *How can we avoid overwriting the output files?*  
Use the TAG\_NAME='tag name' option. If it's used, the tag word is attached to the file name. Be careful that this option is NOT available when the /map option is used.
11. *Is any photometric tool available, and if so, will it be implemented in the official tool kit?*  
Un-official test versions of a photometric tool have been developed, but as yet we did not distribute them, because we are not sure whether the current tools extract sources correctly in all situations; e.g. in such cases as a source near very bright source, sources embedded in the cirrus background, etc. The unofficial photometric tool is available upon request to the developers through the AKARI Helpdesk. The provision of the official photometric tool is not yet decided.
12. *Can I use the same SS-Tools for the CDS mode?*  
The SS-Tool accept the CDS mode and you would obtain the final co-added image in the same manner as the integration mode. However, the calibration method for the CDS mode has not yet been established. If you observed the same object in both the normal integration mode and the CDS mode, scaling of the CDS data to the normal integration data is recommended. Otherwise, please ask more information about the CDS mode to the Helpdesk.