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PACS Stable Developer Build 7.0 1786 (12/04/2011)

Known Problems

- PACS-3604 Solar system object processing: when applying some pipeline tasks, on archive spg products, the task might fall over when looking for 'naifid' in the metadata.
- The unchopped range spectroscopy ipipe scripts are not linked from the pipeline menu. They are available in the build in scripts/pacs/scripts/ipipe/spec/

Photometer Processing

- PacsSpr:3525 Improvements for SSO scan maps
    - ♦ Implement both ways of correction by keyword 'linear'.
    - ♦ Default stays currently with the old behaviour (linear = True)
    - ♦ Old behavior :

      ```
      frames = correctRaDec4Sso(frames, horizonsProduct=horizonsProduct, timeOffset=timeOffset, orbitEphem=orbitEphem)
      frames = correctRaDec4Sso(frames, horizonsProduct=horizonsProduct, timeOffset=timeOffset, linear=1, orbitEphem=orbitEphem)
      ```

    - ♦ New implementation :

      ```
      frames = correctRaDec4Sso(frames, horizonsProduct=horizonsProduct, timeOffset=timeOffset, linear=0, orbitEphem=orbitEphem)
      ```
- PacsSpr:3079 Add start time of last cooler recycling to meta data of products A new calibration product was introduced : CoolerRecyclingTimes
  It is currently available if you update you caltree :
  Menu -> Edit -> Preferences -> PacsCalibration -> Updater -> activate ICC Server
  Tools -> pacs-cal -> run Updater
  In the near future this file will be updated after every OD
  A convenience tool
  times = extractCoolerRecTimes(obs, calTree)
  returns the last cooler recycling of an observation.
- PacsSpr:3275 Map2signalCubeTask gets an additional shortcut: m2sc (besides map2signalCube)
- PacsSpr:3401 Change the oder applying SIAM and Aberration correction
    - ♦ This shall have very minor impact on the coordinates, but correct reverse order of uplink
- PacsSpr:3465 speed thresholds in filterOnScanSpeed are ignored
    - ♦ Filter on scan speed is not yet used in the pipeline, but shall be used in IA scripts
- PacsSpr:3527 IIndLevelDeglitching reports the same quality flags as MMTDeglitching

- PacsSpr:3560 the MapIndex failed in loop mode, if more than one tile was commanded

Spectrometer Processing

Spectrometer Product improvements:

- PacsScr:2945 Frames and PacsCube meta data is made consistent for every product change (like select or join)
- PacsScr:3461 additional meta keywords added: onOffSource, minWave, maxWave, nodCycle, lineId
- PacsScr:2915 All masks which are not excluded in rebinning are propagated from PacsCube to PacsRebinnedCube. They can be obtained with the getFlag() method which returns a Flag dataset, which is similar to a PACS mask.
- PacsScr:3206 calTree version is now in meta data of products
- PacsScr:2454 We have now two more sliced products: SlicedPacsCube and SlicedPacsRebinnedCube. SlicedPacsCube offers the same functionality as SlicedFrames, but SlicedPacsRebinnedCube has limited functionality, since it does not have a blocktable. Add, remove and replace work, but selection should be done with the **pacsSelectSlices** task.

Each slice is described by the following slice info meta keywords (recognizable by description prefix "SLICE_INFO:"):

Keyword	Values	Description
lineId	0..N	Numerical ID of a distinct wavelength range (usually a line scan)
lineDescription	string	Which spectral line has been observed (or tells that it is a range scan)
nodPosition	A/B	Nodding position
nodCycleNum	1..N	Nodding cycle number
isOffPosition	false/true	Is it an off position according to the IsOutOfField status?
onOffSource	0,1,2	Based on new ONSOURCE/OFFSOURCE Status keywords: 0 = not science, 1 = on-source, 2 = off-source
rasterId	N M	first value: raster column, second value: raster line
calBlock	false/true	Belongs to slice to a calibration block?
minWave	float	Minimum wavelength of range
maxWave	float	Maximum wavelength of range
aotMode	string	AOT mode

Also, since these keywords are now always consistent with the BlockTable and Status contents they can and should be used for slice selection. The new task **pacsSelectSlices** does this meta-keyword based selection. It has the same interface as the selectSlices Python function.

Spectrum Explorer

- New extension panel to edit masks is now fully working:
    - PacsSpr:3348 mask viewing in the SE not working with PacsCubes
    - PacsScr:3235 Make sure that the Spectrum Explorer gets updated properly after product changes
    - PacsSpr:3366 mask editing with the spectrum explorer
- PacsSpr:2658 Select All/None buttons for blocks in PacsSpectrumSelectionPanel do not update the Spectrum Explorer plot
- PacsScr:3388 Some more improvements for the PACS extensions of the Spectrum Explorer
- PacsScr:3369 Improve performance of PACS part of updating the spectrum explorer

Pipeline / Ipipe Scripts

- PacsSpr:3036 All level-2 tasks now do an internal loop over line ID. They behave now the same as the level-0/1 tasks: If you do not select a particular line/range before then the level-2 tasks just process all lines/ranges. As a consequence the level-2 products have changed a bit:
    - The wavelength grid is now also stored in a list context, since one needs to pass several ranges from task to task.
    - We no longer have a list context for each line ID within another list context: All slices of a level-2 product are now stored in a single list context. This is much more practical when selecting slices based on arbitrary criteria.
- PacsSpr:3214 The pacsSliceContext task now contains all the rules in the ipipe scripts as default rules: Also, it slices by line ID, raster column, raster line, nodding position, nod cycle number, is out of field and band. The rules in the scripts are also now optional and merely for information.
- The interactive pipeline scripts (ipipe) are now tested in the nightly tester
- PacsSpr:3295 the interactive pipeline scripts (ipipe) are moved in the build from the directory scripts/pacs/spg/pipeline/ipipe/spec to scripts/pacs/scripts/ipipe/spec since they had to be moved to the package pacs_scripts

Task Improvements

- PacsSpr:3451 Wrong coordinates in Spectrometer results -> PacsSpr:3454: update of spec spatial cal file
- PacsSpr:3459 Improvements in wavelength calibration scatter for spectral pixels in band B2B -> wavelength calibration file updated
- PacsSpr:2454 PacsCube and PacsRebinnedCube can now be sliced (slicedPacsCube, slicedPacsRebinnedCube)
- PacsSpr:2840 Status item "GratingCycle" and "IndexInCycle" is now created for unchopped modes
- PacsSpr:2477 Each task has a category now in the user reference manual
- PacsSpr:3408 detection of celestial poles in PacsCube
- PacsSpr:3397 slicedSummary for unchopped advanced script: info tool updated
- PacsSpr:3320 unchopped interactive pipeline scripts -> restructured

Temporary Pools

- PacsScr:3304: Saving intermediate data on machines with low memory is now done more clever: The slices are only saved to the temporary pool when the memory usage is more than 75% and the sliced product contains more than one slice.
- HcssSpr:12637: We have now one temporary pool per HIPE session which is removed after closing HIPE. **Known problem:** these pools are stored in a directory 'null value' wherever you start HIPE (HcssSpr:12911).
- The temporary pools of HIPE are now written under a directory 'null value' which is created where you start HIPE (HcssSpr:12911).
  Workaround: Set the following property in your user.props file:

```
hcss.ia.pg.temporalpoolparent = ${user.home}/.hcss/lstore
```

These temporary pools are called **tmp_product_sink_NNNNN**

- These temporary pools should be removed after you close HIPE, but they are not.

Mask Framework

- New /updated documentation :
    - How to work wih masks: http://herschel.esac.esa.int/twiki/bin/view/Pacs/HowToWorkWithMasks
- PacsSpr:1603: Finally we have a new Mask interface that provides real Mask2d, Mask3d and Mask4d data types.
    - The interface is like the Boolnd interface and (hopefully) all jython accessor methods are implemented.
    - Please find it documented here: http://herschel.esac.esa.int/twiki/bin/view/Pacs/HowToWorkWithMasks
    - Note: the old Mask interface is still available and works as before
- PacsSpr:2926 a new Mask Array Viewer displays Masks with their correct size (also the timeline).
    - It is accessible from the mouse contextual menu in the hipe variables section or from the observation context viewer.
    - The displayed values are boolean (although the hcss viewers match true to 1 and false to 0. This is Sprd HcssSpr:12776).
    - Opening a Mask Product with the Mask Array Viewer shows an additional drop down menu to select from all masks, opening a (previously Int3d) mask array displays only this array as Bool2d, Bool3d or Bool4d (depending on the masks dimensions).
- PacsSpr:3464: masks access with the []-notation from an observation context (obs->frames->mask->getMask(...)) works now (like: obs.refs["level1"].product.refs["HPSFITR"].product.refs[0].product["Mask"].getMask("Glitch"))