

# Herschel Cross Calibration Workshop

## Splinter 1. Spectrometry: Issues and Priorities

### Summary:

- Cross-calibration sample completeness:
  - Classification of point and extended cross calibration sources is not homogeneous across instruments (e.g. IRC+10216, NGC7027, NGC 6302 are considered by HIFI as point source, but extended for PACS & SPIRE)
  - Agreement that CRL 618 is a point source. Suggestion for W Hya as point source (this source is within HIFISTARS programme).
  - A dedicated HSA search for spectral mapping observations of the extended sources G34.3, NGC7023, S140, W49N to assess what is already there for use case b) and decide if additional observations are needed (Elena Puga and ICCs)
- Intended Coordinates:
  - The coordinates of the cross-calibration sources are the same, but mismatch found in the commanded coordinates has been found for HIFI on NGC6302 and AFGL2688. This affects the present comparison for these sources. Design of the HIFI calibration observations (3x3 nyquist sampled raster map) expects to give interpolation of the spectrum at any coordinate within the map. Action HIFI to decide what coordinates to give for Cycle 60-61.
- Definition of analysis output
  - Present approach of spectral line flux comparison at the respective native spectral resolution needs to be compared with the results degrading the HIFI resolution to SPIRE and PACS's. In the case of HIFI-SPIRE it is more complicated to convolve to the unapodized spectrum, but it can be done (Peter Imhof). Quantitative line flux determinations are obtained from the unapodized spectrum. The tools for HIFI to PACS are already in place.
- Analysis output format homogenization
  - The output format will be proposed by PACS. SPIRE and HIFI to comment.

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- Open Items:
  - Mispointing corrections:
    - \_ Mispointing affects PACS severely, the pointing offset correction tool is underway. The 3x3 spaxel spectra coadding in the mean time mitigates the mispointing problem for PACS. The 3x3 point source correction is not yet available but it will soon be. New extraction in the PACS rebinned map will be obtained.
  - Source Extent:
    - \_ Two approaches:
      - Search for available spectral maps to determine the source size at the line frequency.
      - Continuum photometry maps for SPIRE and PACS. 2D Gaussian fit in each channel for size estimate. This method is being used in SPIRE.
  - Line Contamination
    - \_ HIFI input to assess number of line components to fit for SPIRE.
  - Fitting strategy (a priori assumptions on centroid, width, other free parameters and error calculation)
    - \_ PACS and SPIRE line fitting approaches are very similar since they fit a list of significant lines that are detected by eye. Peter Imhof will increase the number of lines to fit in the line contamination cases and include those in the output.

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- Roadmap:
  - Touchbase more frequent than Cross-calibration workshops triggered by Elena Puga.
  - Contact points: Michael Migo Mueller (HIFI), Pierre Royer (PACS), Peter Imhof (SPIRE)
  - Next telecon: mid-February, frequency: TBD, proposal: 1-2 months.