SPIRE information for the Herschel Calibration Workshop

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SPIRE calibration source requirements

This note gives a brief overview of the SPIRE instrument and it's requirements on calibration sources and models.

SPIRE instrument overview & sensitivity estimates

A good overview of the SPIRE instrument, science goals, and performance estimates is given in the following embedded documents.

"The Herschel-SPIRE instrument" – M.Griffin et al. SPIE 2004 (Glasgow)	Talk given at the "Dusty & molecular universe" conference – Paris – 27-29th October 2004
 spie04_spire_5487-16.pdf	 dusty04_Paris4_SPIRE.pdf

Both of these documents give the latest sensitivity estimates, but no indication of the high-flux limit (dynamic range). At higher flux levels, the response of the detectors will depart from linearity in a graceful manner, which can be calibrated out with a small associated error. However, there will come a point at which we will have to change the offsets, which we want to avoid unless really necessary. As a guide, the in-band (200-700μm) flux from Uranus is expected to be at the upper end of our dynamic range, beyond which we would need to change the offsets.

Requirements on calibration sources

Source requirements for photometer:-

- Point-like sources (in 18" beam)
- Within normal dynamic range of SPIRE
  - Not too faint – well above confusion limit - >~100mJy
  - Not too bright – small correction for non-linearity - <~200Jy
  - These figures are rough estimates
  - To assist with occasional observations of bright sources, bright calibrators may be useful
- Non-variable, or known variability
- Good sky distribution – need to define what good sky distribution means for Herschel
- Well modelled/known SEDs with in-band accuracies > SPIRE requirement (10%)
  - No line contamination is desirable

Source requirements – spectrometer

- Similar dynamic range to photometer – numbers TBD
- Line fluxes accurately known or predicted
- Point-like
- Non-variable
- Several observable lines available - desirable
- Good sky distribution
- Lines must be well isolated
  - Coverage of FTS dynamic range
- All above bullets apply to line spectroscopy, for spectrophotometry (low-resolution), the photometer requirements apply (with minor changes to the numbers)

Web links to SPIRE information

General SPIRE page at Cardiff University
http://www.astro.cf.ac.uk/groups/instrumentation/projects/spire/
Compilation of SPIRE documents may be found here:-
http://research.uleth.ca/spire/
Dusty & molecular universe flyer
http://astro.estec.esa.nl/Herschel/Publ/2004/dusty04_Paris0_Flyer.pdf
Community information on Herschel
http://astro.estec.esa.nl/Herschel/community_info.shtml