1. Introduction

This technical note is a first look in detail at the performance tests in terms of the test products which are needed in order to do offline analysis of the test data. It should be noted that as this is still a first look at the issue and both table contents and in particular metadata definitions are likely to be changed, therefore it is strongly requested that any implementation of the product definitions is done in such a way that their content is easily user configurable.

Still to do….

- The descriptive information here needs to be converted into parameter names. It is intended to include this as a cross reference matrix in the next iteration of this note, once the Data and TFCS ICDs have been updated. This cross reference may be one to one e.g. OBSID but is also likely to yield a one to many correspondence in some cases, such as cold black body temperature.
- Some of the functional tests also require QLA so this note will need updating with a functional test section when the final list of functional tests is available.
- This note does not consider the data produced by offline analysis which will need to be stored back in the database, this may be done later in a separate note.

2. Standard Data

As far as possible these tables are based on one instrument setting so for some tests a lot of tables will be produced. I think this is a better approach than trying to group together large chunks of data which might be suitable for one type of analysis but not another. It also seems a natural way to use a database.

Assumptions

- The commanding scheme has not yet been defined but for simplicity I've assumed one instrument/facility setting (cold bb temperature, chop frequency etc) to be identified by one step, this could lead to say multiple load curves, multiple chop cycles or multiple SMEC scans being identified by one step. In each case I think we can sort this out in analysis afterwards, but where further information is available, e.g. SMEC scan number, this has been included in the table.
- It is still not clear what we will be doing with the detector offsets. I'm assuming once we've established a nominal bias amplitude and frequency we will only set the offset once for each test by either direct command or automatic setting. Therefore for these observations I'm assuming we can put one value per detector in the metadata. For the load curve data the offset is essentially the data we are after so this should be in the tables, however it is not clear how this will be known unless the load curve commanding has some sort of offset setting for each bias step. Also given that the detector readout will be pretty insignificant compared with the offset is it worth combining the two in the load curve product as assumed or should we just use the offset?

Standard Metadata

<u>Standard Metadata</u>
Date, Time, Test-ID, OBSID, Step (TBC), detector bias amplitudes (note for load curves this will be meaningless), detector offsets (one per detector, meaningless for load curves), bias frequencies, detector temperatures, flip mirror position, array id, cooler temperatures

Standard Tables

<u>Noise Format 1</u>
Time
Detector data, all pixels

<u>Noise Format 2</u>
Frequency
Power Spectra all pixels

<u>PCAL Format</u>
Time
Detector data, all pixels
PCAL Current (probably downlink value)
PCAL Bias Voltage

<u>BSM Test Data Format</u>
Time
Detector data, all pixels
BSM chop axis position
BSM jiggle axis position

<u>Raster Data Format 1</u>
Time
Detector data all pixels
T/S X position
T/S Y position
T/S Z position

<u>Raster Data Format 2</u>
Time
Demodulated detector data all pixels
T/S X position
T/S Y position

T/S Z position

Load Curve Format 1
Time
Bias Level for Sub-array
Detector offsets all pixels in sub-array
Detector data all pixels in sub-array

Load Curve Format 2
Bias Level for Sub-array
Averaged detector data (offset plus value TBC) at each bias all pixels in sub-array

Time Constant Format
Chop Frequency
Averaged Demodulated Detector Output

FTS Format
Time
FTS Position

Spectrometer Format
Time
SMEC Encoder Position (need to check whether one or three)
SMEC LVDT Position
SMEC scan number
Detector data all pixels

Step and Look Format
Time
Detector data, all pixels
BSM chop axis position
BSM jiggle axis position
SMEC Encoder Position (need to check whether one or three)
SMEC LVDT Position
SMEC scan number

ZPD Format
Time
Detector data, all pixels
SMEC LVDT position
SMEC encoder position

3. Performance Test Specific Data Definition

PKU – Peakup

Observation Summary

Put the T/S at nominal pixel centre, of the pixel under test, set the demodulation, do a raster around the pixel, work out where the peak flux is, set this position for the next part of the test, separate OBSID to rest of test?

Data – assuming one of each data set for each pixel

Raster Data Format 1
Raster Data Format 2

Metadata

Standard + Hot BB Temperature or Laser Line wavelength, BSM position (if switched on), chop frequency, adopted centre pixel position in telescope simulator X,Y,Z coordinates, integration time per position, Step (TBC), pixel ID, lab temperature, lab humidity

BCT-P – BSM Chop Throw

Observation Summary

Possibly do a peak up with T/S to find the centre of the first pixel then chop with BSM between this pixel and another one. Repeat for other pixel pairs, could be separate OBSID for each pixel pair or separate step, unclear whether need to peakup each time. Likely to only be done with the photometer.

Data – assuming one set for peakup (or each pixel, see PKU), assuming one set per pixel pair per array

BSM Data Format

Metadata

Standard + Step, Pixel 1 ID, Pixel 2 ID, Hot BB Temperature, Telescope Simulator X, Y, Z positions (TBC). BSM commanded chop frequency (may not be necessary), integration time per chop position, OBSID of associated peakup observation (if used), adopted centre pixel position ID1 X,Y,Z (TBC), flip mirror position, lab temperature, lab humidity

BHD – BSM Holding

Observation Summary

BSM switched on, put BSM at an extreme position, hold it there, move to another extreme position etc. Do this for extremes in chop axis (2 positions), extremes in jiggle axis (2 positions), plus extremes in chop plus jiggle together (4 positions).

Data – assuming one set for each position
BSM Data Format

Metadata
Just standard metadata.

BSM-P – BSM Photometer Characterisation

Observation Summary
Chopped blackbody through the telescope simulator. Peakup on a pixel with the telescope simulator then use the BSM to steer round the pixel in a 2-D raster. Not sure if peakup will be used on each pixel tested or after the first pixel

Data – assuming one set for peakup (or each pixel, see PKU), and one for each pixel
BSM Data Format

Metadata
Step no., Pixel ID, Telescope simulator co-ordinates X,Y,Z, Hot BB Temperature, integration time per raster position, OBSID of associated peakup observation (if used), chop frequency, lab temperature, lab humidity

BSM-S – BSM Spectrometer Characterisation

Observation Summary
Chopped blackbody through the telescope simulator, SMEC at ZPD. Peakup on a pixel with the telescope simulator then use the BSM to steer round the pixel in a 2-D raster. Not sure if peakup will be used on each pixel tested or after the first pixel.

Data – assuming one set for peakup (or each pixel, see PKU), and one for each pixel
BSM Test Data Format

Metadata
Step no., Pixel ID, Telescope simulator co-ordinates X,Y,Z, Hot BB Temperature, integration time per raster position, OBSID of associated peakup observation (if used), chop frequency, SMEC LVDT position, SMEC encoder position

CPC-P – PCAL Setup With Photometer Detectors

Observation Summary
Cold black body illuminates all detectors. Set photometer to initial bias, take a set of load curves, set PCAL to maximum current, repeat load curves, repeat for other PCAL settings, repeat for other BB settings. Assuming each PCAL setting is a step, each black body setting an OBSID.

Data – one set for each sub-array for each cold black body setting
Load Curve Format 1 for each sub-array
Load Curve Format 2 for each sub-array

Metadata
Step, Sub-array ID, cold black body temperature, PCAL current (uplink and downlink), PCAL voltage, integration time at each bias

CPC-S – PCAL Setup With Spectrometer Detectors

Observation Summary
Cold black body illuminates all detectors. Set the SMEC to ZPD (TBC). Set spectrometer arrays to initial bias, take a set of load curves, set PCAL to maximum current, repeat load curves, repeat for other PCAL settings, repeat for other BB settings. Assuming each PCAL setting is a step, each black body setting an OBSID. May try this with both ZPD and home.

Data – one set for each sub-array for each PCAL current setting for each cold black body setting
Load Curve Format 1
Load Curve Format 2

Metadata
Step, Sub-array ID, cold black body temperature, PCAL current (uplink and downlink), PCAL voltage, integration time at each bias, SMEC LVDT position, SMEC encoder position

CPT - PCAL Time Constant (Photometer)

Test removed

CSC-S – Spectrometer Calibrator Characterisation

Observation Summary
The instrument is set up with both the cold black body and SCAL in use. The SMEC is scanned TBD times over a short range about the ZPD at various velocities. This is repeated for various scan ranges. The whole thing is repeated for other SCAL settings. The whole thing is then repeated for each black body setting. It is not clear how we will order the exploration of this parameter space apart from the fact that the black body settings will definitely be done separately.

Data
One set for one array for one scan range, one scan velocity, one SCAL setting and one black body setting:
Spectrometer Format

Metadata
SCAL 2 command current, SCAL2 current, SCAL2 bias, SCAL4 command current, SCAL4 current, SCAL4 bias, cold black body temperature, SMEC scan velocity, SMEC scan range, no of SMEC scans (there may be more later!)

CSR-S – Spectrometer Calibrator Room Temperature Nulling

Observation Summary
Set up the spectrometer to look at the room. Take spectrometer scans for various SCAL settings to see which one best nulls the room.

Data
One set for each SCAL setting
Spectrometer Format

Metadata
Step, SCAL 2 command current, SCAL2 current, SCAL2 bias, SCAL4 command current, SCAL4 current, SCAL4 bias, lab temperature?, SMEC scan velocity, SMEC scan range, no of SMEC scans, (there may be more later!)

CST-S – Spectrometer Calibrators Performance With Time

Observation Summary
Set up the spectrometer to scan a cold black body with SCAL in use. Intermittent PCAL flashes are to check the stability of SCAL and this could be repeated for various SCAL/black body settings. For now I'm assuming we move the SMEC to ZPD to do this each time although we could do this at home (depends on results from CPC-S).

Data
One set for each SCAL/cold black body setting and one for each PCAL flash
Spectrometer Format for the scanning
PCAL Format for the flashes

Metadata
Scan data

Step, SCAL 2 command current, SCAL2 current, SCAL2 bias, SCAL4 command current, SCAL4 current, SCAL4 bias, SMEC scan velocity, SMEC scan range, no. of SMEC scans, (there may be more later!), cold black body temperature

DAB-P – Photometer Blanked Load Curves (AC Bias)

Observation Summary
Set of 'blanked' (i.e. looking at 4K) load curves for the photometer detectors, with a number (3, TBC) taken at each bias frequency. Time permitting we could also repeat this for other cooler settings.

Data
One set for each bias frequency and each cooler temperature
Load Curve Format 1 for each sub-array
Load Curve Format 2 for each sub-array

Metadata
Step, TBD temperatures, sub-array ID, integration time at each bias, maybe more once commanding scheme is further developed

DAB-S – Spectrometer Blanked Load Curves (AC Bias)

Observation Summary
Same as DAB-P except using the spectrometer, the SMEC will be switched off

Data
Same as DAB-P

Metadata
Same as DAB-P

DAL-P – Photometer Optical Load Curves (AC Bias)

Observation Summary
The same as DAB-P but this time with the cold black body switched on. The load curves are done for a set of bias frequencies at each black body setting. If we have time we might also try heating up the cooler and repeating, probably at selected frequencies.

Data
One set for each bias frequency, cold black body setting and cooler temperature
Load Curve Format 1 for each sub-array
Load Curve Format 2 for each sub-array

Metadata
Step, TBD temperatures, cold black body temperature, sub-array ID, integration time at each bias, maybe more once the commanding scheme is further developed

DAL-S – Spectrometer Optical Load Curves (AC Bias)

Observation Summary
Same as DAL-P, but this time with the spectrometer. Not sure yet what we will do with the SMEC but my preferred option would be ZPD as this gives us greatest signal, but any position where we know the flux reaching the detectors is in principle OK

Data
Same as DAL-P

Metadata
Step, TBD temperatures, cold black body temperature, sub-array ID, SMEC LVDT position, SMEC encoder position, integration time at each bias, maybe more once the commanding scheme is further developed

DAM-P – Photometer Microphonics (AC Bias)

Observation Summary
Checks the photometer for microphonics using a vibrator, essentially take a time series with the vibrator switched off, then a time series with it switched on. It is not clear what settings are available or even if there is more than simply on/off, assuming one step for each setting.

Data
Noise Format 1
Noise Format 2

Metadata
Step, vibrator setting, cold black body setting, integration time

DAM-S – Spectrometer Microphonics (AC Bias)

Observation Summary
Same as DAM-P, SMEC is switched off

Data
Same as DAM-P

Metadata
Same as DAM-P

DMA-P – Photometer Mechanism Microphonics (AC Bias)

Observation Summary
Similar to DAM-P except this time we look for microphonics with mechanism movement rather than by using a vibrator. Test consists of taking a time series, then turning on a mechanism, and then moving it while taking data. Not sure yet about where we will do the three types of BSM movement (chop axis, jiggle axis, chop+jiggle axis) separately, current baseline is that we will. SMEC step and look operation not included.

Data
Assuming one step per movement type
Noise Format 1 all non BSM or Spectrometer steps
Noise Format 2 all steps
BSM Format if applicable
Spectrometer Format if applicable

Metadata
Noise Format 1
Step, cold black body temperature, integration time, SMEC scan range, SMEC scan velocity, number of scans

DMA-S – Spectrometer Mechanism Microphonics (AC Bias)

Observation Summary
Same as DMA-P with the spectrometer, assuming should be able to take noise data even though SMEC is moving as it is always looking at a 4K environment.

Data
Same as DMA-P

Metadata
Same as DMA-P

DNA-P – Photometer Noise Test (AC Bias)

Observation Summary
Big noise test involving exploring bias amplitude and frequency parameter space under dark conditions. Would be nice to explore this parameter space at different operating temperatures if we have time.

Data
One set for each bias frequency and bias amplitude setting
Noise Format 1
Noise Format 2

Metadata
Step, integration time

DNA-S – Spectometer Noise Test (AC Bias)

Observation Summary
Same as DNA-P with the spectrometer

Data
One set for each bias frequency and bias amplitude setting
Noise Format 1
Noise Format 2

Metadata
Step, integration time

DNC-P – Photometer Noise Test With Cold Black Body (AC Bias)

Observation Summary
Same as the main noise test DNA, except the black body is now switched on and set to give equivalent flux to the telescope.

Data
One set for each bias frequency and bias amplitude setting
Noise Format 1
Noise Format 2

Metadata
Step, cold black body temperature, integration time

DNC-S – Spectrometer Noise Test With Cold Black Body (AC Bias)

Observation Summary
Same as the main noise test DNA-S, except the black body is now switched on and set to give equivalent flux to the telescope.

Data
One set for each bias frequency and bias amplitude setting
Noise Format 1
Noise Format 2

Metadata
Step, cold black body temperature, integration time

DPL-P – Photometer Polarisation Check

Observation Summary
Detector polarisation check by looking through a polariser at various orientations. As this is easier done outside the cryostat we will use the hot black body source fed through the telescope simulator. A quick signal check will be done with the polariser absent first.

Data
One set for each pixel, the initial check then each polariser setting
Noise Format 1
Noise Format 2

Metadata
Step, hot black body temperature, integration time, telescope simulator X,Y, Z positions, pixel ID, lab temperature, lab humidity, chop frequency, polariser setting, associated peakup OBSID

DPL-S – Spectrometer Polarisation Check

Observation Summary
Spectrometer detector polarisation check by looking through a polariser at various orientations. The SMEC will be set to ZPD, not sure if SCAL is needed for room temperature nulling. As this is easier done outside the cryostat we will use the hot black body source fed through the telescope simulator. A quick signal check will be done with the polariser absent first.

Data
One set for each pixel, the initial check then each polariser setting
Noise Format 1
Noise Format 2

Metadata
Step, hot black body temperature, integration time, telescope simulator X,Y, Z positions, pixel ID, lab temperature, lab humidity, chop frequency, polariser setting SMEC LVDT position, SMEC encoder position, associated peakup OBSID

DRB-P – Photometer detectors relative response using the external black body

Observation Summary

Measure the response of a pixel to an external black body fed through the telescope simulator, changing attenuation gives linearity and point source coupling. By varying the chop frequency we can also measure the detector time constant. May need to peak up on each pixel first.

Data

One set for each pixel, bias, chop frequency, hot black body setting, attenuation, of
Noise Format 1
One set for each pixel, bias, hot black body setting, attenuation of
Time Constant Format

Metadata

Step, chop frequency (noise format only), integration time, telescope simulator X,Y,Z position, hot black body temperature, attenuation, pixel ID, lab temperature, lab humidity

DRB-S – Spectrometer detectors relative response using the external black body

Observation Summary

Measure the response of a pixel to an external black body fed through the telescope simulator, changing attenuation gives linearity and point source coupling. By varying the chop frequency we can also measure the detector time constant. May need to peak up on each pixel first. The SMEC is set to ZPD for this test.

Data

One set for each pixel, bias, chop frequency, hot black body setting, attenuation, of
Noise Format 1
One set for each pixel, bias, hot black body setting, attenuation of
Time Constant Format

Metadata

Step, chop frequency (noise format only), integration time, telescope simulator X,Y,Z position, hot black body temperature, attenuation, pixel ID, SMEC LVDT position, SMEC encoder position, lab temperature, lab humidity

DRL-P – Photometer detectors relative response using the laser

Observation Summary

Same as DRB except using the laser rather than the black body.

Data
Same as DRB

Metadata
Same as DRB except laser line wavelength instead of black body temperature

DRL- S – Spectometer detectors relative response using the laser

Observation Summary
Same as DRB except using the laser rather than the black body.

Data
Same as DRB

Metadata
Same as DRB except laser line wavelength instead of black body temperature

DSR-P – Spectral Response of Photometer Detectors

Observation Summary
The spectral response of the photometer is measured by scanning the hot black body source with the facility FTS. Depending on the pixel we may use the full range i.e. highest resolution, or part of the range lower resolution. Time constraints are likely to influence the number of pixels we are able to measure.

Data
I've not seen the minutes from the meeting with the Canadians but I'm assuming we are still planning to have separate files for the detectors and the FTS. Assuming one pixel per step.
Noise Format 1
FTS Format

Metadata
Step, Pixel ID, Hot black body temperature, Telescope simulator X,Y,Z position, FTS scan speed, FTS scan range, lab temperature, lab humidity

DSR-S – Spectral Response of the Spectrometer Detectors

Observation Summary
The spectral response of the spectrometer is measured by scanning the hot black body source with the facility FTS. We will use the full range for all pixels. The RSRF will also be measured with the SMEC but this test decouples the detector response with the spectrometer response.

Data

I've not seen the minutes from the meeting with the Canadians but I'm assuming we are still planning to have separate files for the detectors and the FTS. Assuming one pixel per step.
Noise Format 1
FTS Format

Metadata

Step, Pixel ID, Hot black body temperature, Telescope simulator X,Y,Z position, FTS scan speed, FTS scan range, SMEC LVDT position, SMEC encoder position, lab temperature, lab humidity

OBE-P – Out of band radiation check in the photometer using an edge filter

Observation Summary

Out of band radiation passing into the photometer is searched for using an edge filter. The test starts by taking a measurement with a laser line, then a second measurement is made with an edge filter placed in the beam. If possible a third measurement should be taken without the laser as a sanity check on detector behaviour but time constraints on powering the laser might make this impractical. Also, as OBFP (see below) has been deleted this one may follow as the same constraints apply.

Data

Separate data sets for each pixel with the filter and each pixel without the filter
Noise Format 1

Metadata

Step, pixel ID, laser line wavelength, Telescope simulator X,Y,Z position, lab temperature, lab humidity, filter position, chop frequency, integration time, associated Peakup OBSID

OBE-S – Out of band radiation check in the spectrometer using an edge filter

Observation Summary

Out of band radiation passing into the spectrometer is searched for using an edge filter. The test starts by taking a measurement with a laser line, then a second measurement is made with an edge filter placed in the beam. If possible a third measurement should be taken without the laser as a sanity check on detector behaviour but time constraints on powering the laser might make this impractical. The SMEC is placed at ZPD.

Data

Separate data sets for each pixel with the filter and each pixel without the filter
Noise Format 1

Metadata
Step, pixel ID, laser line wavelength, Telescope simulator X,Y,Z position, lab temperature, lab humidity, filter position, chop frequency, integration time, associated Peakup OBSID, SMEC LVDT position, SMEC encoder position

OBFP-P – Photometer out of band radiation search using the facility FTS

Test deleted as cryostat filtering is unlikely to allow OOB radiation to enter the instrument.

OBFP-S – Spectrometer out of band radiation search using the facility FTS

Test deleted

OBL-P – Photometer out of band radiation check using the laser

Observation Summary
Out of band laser lines will be used to check for OOB rejection. Several pixels will be tested with each line as it is quicker to drive the telescope simulator than to change lines.

Data
Noise Format 1

Metadata
Step, pixel ID, laser line wavelength, Telescope simulator X,Y,Z position, lab temperature, lab humidity, chop frequency, associated peakup OBSID

OBL-S – Spectrometer out of band radiation check using the laser

Observation Summary
Out of band laser lines will be used to check for OOB rejection. Several pixels will be tested with each line as it is quicker to drive the telescope simulator than to change lines. The SMEC will sit at ZPD.

Data
Noise Format 1

Metadata
Step, pixel ID, laser line wavelength, Telescope simulator X,Y,Z position, lab temperature, lab humidity, chop frequency, SMEC LVDT position, SMEC encoder position

OBP-S - Balancing of ports

Observation Summary

This test verifies that the two output ports of the SPIRE spectrometer have the same performance so that the nulling is performed evenly. The SMEC is scanned full range with the cold black body in the beam then the test is repeated with the cold black body switched off and SCAL in the beam. When we come to detailed scheduling the data might be obtained with by other tests (e.g. SMC-S for the black body) so this check may only be made in analysis.

Data

Spectrometer Format

Metadata

Step, cold black body temp, SCAL 2 command current, SCAL2 current, SCAL2 bias, SCAL4 command current, SCAL4 current, SCAL4 bias

OPB-P - Spatial mapping of each photometer pixel using the BSM

Observation Summary

To determine the relative spatial response of a pixel as a function of the near-beam position in the focal plane of the telescope simulator. The hot black body is used as a point source which is rastered by the BSM around a pixel. We will peak up first then do an offset raster (makes the analysis easier). Although this serves a slightly different purpose to BSM-P i.e. may require different rasters, we could consider combining these two tests.

Data

BSM Data Format

Metadata

Step, pixel ID, hot black body temperature, lab temperature, lab humidity, chop frequency, associated peakup OBSID, telescope simulator X,Y,Z position, integration time

OPB-S - Spatial mapping of each spectrometer pixel using the BSM

Observation Summary

Same as OPB-P except using spectrometer detectors, need the SMEC at ZPD to get max possible signal at raster edges.

Data

BSM Data Format

Metadata

Step, pixel ID, hot black body temperature, lab temperature, lab humidity, chop frequency, associated peakup OBSID, telescope simulator X,Y,Z position, integration time, SMEC LVDT position, SMEC encoder position

OPI-P – Photometer Pupil Scanning

Observation Summary

This test is used to determine instrument throughput. The laser is scanned across the pupil plane and the resulting signal vs angle is analysed to get the beam angular spread O. Along with the beam area, which is measured separately, the throughput AO is determined.

Data

One set for each pixel, each angular position
Noise Format 1

Metadata

Step, pixel ID, telescope simulator X,Y,Z position, chop frequency, laser line raster position (?,F), laser line wavelength, integration time per raster position, lab temperature, lab humidity, associated peakup OBSID

OPI-S – Spectrometer Pupil Scanning

Observation Summary

Same as OPI-P except with the spectrometer. The SMEC is set to ZPD.

Data

One set for each pixel, each angular position
Noise Format 1

Metadata

Step, pixel ID, telescope simulator X,Y, Z position, chop frequency, laser line raster position (?,F), laser line wavelength, integration time per raster position, lab temperature, lab humidity, SMEC LVDT position, SMEC encoder position

OSB-P - Spatial mapping of each photometer pixel using the hot black body

Observation Summary

Same as OPB except using the telescope simulator to do the rastering instead of the BSM, actually the results from this test is likely to be used to confirm the BSM pointing in OPB.No sure yet whether we will use this test to develop peakup.

Data
Raster Format 1
Raster Format 2

Metadata
Step, pixel ID, hot black body temperature, lab temperature, lab humidity, chop frequency

OSB-S - Spatial mapping of each spectrometer pixel using the hot black body

Observation Summary
Same as OPB except using the telescope simulator to do the rastering instead of the BSM, actually the results from this test are likely to be used to confirm the BSM pointing in OPB. SMEC is set to ZPD

Data
Raster Format 1
Raster Format 2

Metadata
Step, pixel ID, hot black body temperature, lab temperature, lab humidity, chop frequency, SMEC LVDT position, SMEC encoder position

OSL-P - Spatial mapping of each photometer pixel using the laser

Observation Summary
Same as OSB except using the laser instead of the black body. This has the advantage of coherence but the disadvantage of lack of stability.

Data
Raster Format 1
Raster Format 2

Metadata
Step, pixel ID, laser line wavelength, lab temperature, lab humidity, chop frequency

OSB-S - Spatial mapping of each spectrometer pixel using the laser

Observation Summary
Same as OSL-P except this time with the spectrometer. SMEC is set to ZPD

Data
Raster Format 1
Raster Format 2

Metadata
Step, pixel ID, laser line wavelength, lab temperature, lab humidity, chop frequency, SMEC LVDT position, SMEC encoder position

SCF-P – Spectrometer Channel Fringing Search

Observation Summary
To search for channel fringing in the spectrometer, we set the SMEC position and scan the FTS. For DSR we deeply sample at ZPD, for this test we sample other path differences.

Data
One data set per SMEC position per pixel
FTS Format
Noise Format 1

Metadata
Step, pixel ID, telescope simulator X,Y, Z position, black body temperature, integration time per raster position, lab temperature, lab humidity, SMEC LVDT position, SMEC encoder position, FTS scan speed, FTS scan range

SFC-S – Fringe Contrast and Spectral Response While Scanning

Observation Summary
To check the SMEC fringe contrast by scanning a set of lines, I'm not sure if SCAL is needed for room temperature nulling, assuming it isn't for now.

Data
One set for each pixel for each line wavelength used
Spectrometer Format

Metadata
Step, pixel ID, telescope simulator X,Y, Z position, black body temperature, lab temperature, lab humidity, SMEC scan range, SMEC, scan velocity, number of scans, OBSID of associated Peakup observation

SFL-S – Fringe Contrast and Spectral Response While Using Step and Look

Observation Summary
To check the SMEC fringe contrast by scanning a set of lines in step and look mode i.e. additionally using the BSM for chopping. I'm not sure if SCAL is needed for room temperature nulling.

Data
For each pixel pair for each line:
Step and Look Format

Metadata
Step, pixel ID1, pixel ID2, telescope simulator X,Y, Z position, black body temperature, lab temperature, lab humidity, SMEC LVDT position, SMEC encoder position, no of chop cycles per position, BSM commanded chop frequency (may not be necessary), integration time per chop position, OBSID of associated peakup observation (if used)

SMC-S – SMEC Scanning Characterisation

Observation Summary
This test characterises the behaviour of the SMEC mechanism with the detectors by exercising its velocity, scan range parameter space. We would time permitting also check different backgrounds with the cold black body.

Data
One set per black body setting per scan range per scan velocity
Spectrometer Format

Metadata
Step, Cold black body temperature SMEC scan range, SMEC scan velocity, number of scans

SML-S – SMEC Step and Look Characterisation

Observation Summary
This test characterises the behaviour of the SMEC mechanism with the detectors by exercising the step and look mode. Unfortunately as step and look requires a source plus background to be present we have to use the telescope simulator and only do one pixel at a time, unlike SMC where we can get at all the detectors.

Data
One set per pixel
Step and Look Format

Metadata
Step, pixel ID1, pixel ID2, telescope simulator X,Y, Z position, hot black body temperature, lab temperature, lab humidity, no of chop cycles per SMEC position, BSM commanded chop frequency

(may not be necessary), integration time per chop position, OBSID of associated peakup observation (if used)

SZP-S – SMEC ZPD Determination

Observation Summary

Modulate the signal by progressively moving the SMEC to a position then back to home then to the next position etc. Should do this with fine resolution near expected ZPD position.

Data

ZPD Format

Metadata

Step, integration time per step, cold black body temperature

4. Cross Reference Between Metadata and Performance Tests

Test / Meta-Data	FKU	ECT-F	EHD	ESM-F	BSM-S	CFC-F	CPC-S	CFE-F	CSC-S	CSR-S	CST-S	DAE-F	DAB-S	DAL-F	DAL-S	DAM-F	DAM-S	DMA-F	DMA-S	DNA-F	DNA-S	DNC-F	DNC-S	DFL-F	DPL-S	DFE-F	DRB-S	DFL-F	DRL-S	DSF-F	DSR-S	CEE-F	OBE-S	CEL-F	OBL-S	CEF-F	OPB-S	CFI-F	OPI-S	CSE-F	OSB-S	CSL-F	OSL-S	SCF-S	SFC-S	SFL-S	SMC-S	SML-S	SZP-S
Standard Metadata																																																	
Date	\	\	\	\	V	\	V	[	V	V	V	\	V	\	V	\	V	\	V	\	V	\	V	\	V	\	V	\	V	\	V	\	V	\	V	\	V	\	V	\	V	\	V	V	V	V	V	V	V
Time	\	\	\	\	V	\	V	€	V	V	V	\	V	\	V	\	V	\	V	\	V	\	V	\	V	\	V	\	V	\	V	\	V	\	V	\	V	\	V	\	V	\	V	V	V	V	V	V	V
Test-ID	\	\	\	\	V	\	V	|	V	V	V	\	V	\	V	\	V	\	V	\	V	\	V	\	V	\	V	\	V	\	V	\	V	\	V	\	V	\	V	\	V	\	V	V	V	V	V	V	V
OBSID	\	\	\	\	V	\	V	€	V	V	V	\	V	\	V	\	V	\	V	\	V	\	V	\	V	\	V	\	V	\	V	\	V	\	V	\	V	\	V	\	V	\	V	V	V	V	V	V	V
Step (TBC),	\	\	\	\	V	\	V	t	V	V	V	\	V	\	V	\	V	\	V	\	V	\	V	\	V	\	V	\	V	\	V	\	V	\	V	\	V	\	V	\	V	\	V	V	V	V	V	V	V
bias amplitudes[1]	\	\	\	\	V	\	V	€	V	V	V	\	V	\	V	\	V	\	V	\	V	\	V	\	V	\	V	\	V	\	V	\	V	\	V	\	V	\	V	\	V	\	V	V	V	V	V	V	V
bias frequencies[1]	\	\	\	\	V	\	V	(	V	V	V	\	V	\	V	\	V	\	V	\	V	\	V	\	V	\	V	\	V	\	V	\	V	\	V	\	V	\	V	\	V	\	V	V	V	V	V	V	V
detector offsets	\	\	\	\	V	\	V		V	V	V	\	V	\	V	\	V	\	V	\	V	\	V	\	V	\	V	\	V	\	V	\	V	\	V	\	V	\	V	\	V	\	V	V	V	V	V	V	V
detector temperature	\	\	\	\	V	\	V		V	V	V	\	V	\	V	\	V	\	V	\	V	\	V	\	V	\	V	\	V	\	V	\	V	\	V	\	V	\	V	\	V	\	V	V	V	V	V	V	V
flip mirror position	\	\	\	\	V	\	V		V	V	V	\	V	\	V	\	V	\	V	\	V	\	V	\	V	\	V	\	V	\	V	\	V	\	V	\	V	\	V	\	V	\	V	V	V	V	V	V	V
array id	\	\	\	\	V	\	V		V	V	V	\	V	\	V	\	V	\	V	\	V	\	V	\	V	\	V	\	V	\	V	\	V	\	V	\	V	\	V	\	V	\	V	V	V	V	V	V	V
cooler temperature	\	\	\	\	V	\	V		V	V	V	\	V	\	V	\	V	\	V	\	V	\	V	\	V	\	V	\	V	\	V	\	V	\	V	\	V	\	V	\	V	\	V	V	V	V	V	V	V
Test Specific Metadata																																																	
Hot BB Temperature	\	\	›	\	V	›	X	[	X	X	X	›	X	›	X	›	X	›	X	›	X	›	X	\	V	\	V	›	X	\	V	›	X	›	X	\	V	›	X	\	V	›	X	V	V	X	X	V	X

Cold BB Temperature	›	›	›	›	X	\	V	(	V	X	V	›	X	\	V	\	V	\	V	›	X	\	V	›	X	›	X	›	X	›	X	›	X	›	X	›	X	›	X	›	X	›	X	X	X	X	V	X	V
Laser Line wavelength	\	›	›	›	X	›	X	l	X	X	X	›	X	›	X	›	X	›	X	›	X	›	X	›	X	›	X	\	V	›	X	\	V	\	V	›	X	\	V	›	X	\	V	X	X	V	X	X	X
BSM position	\	›	›	›	X	›	X	(	X	X	X	›	X	›	X	›	X	›	X	›	X	›	X	›	X	›	X	›	X	›	X	›	X	›	X	›	X	›	X	›	X	›	X	X	X	X	X	X	X
chop frequency	\	›	›	›	X			t	X	X	X	›	X	›	X	›	X	›	X	›	X	›	X	\	V	\	V	\	V	›	X	\	V	\	V	\	V	\	V	\	V	\	V	X	X	X	X	X	X
adopted centre pixel position in T/S X	\	\	›	\	V	›	X	(	X	X	X	›	X	›	X	›	X	›	X	›	X	›	X	\	V	\	V	\	V	\	V	\	V	\	V	\	V	\	V	›	X	›	X	V	V	V	X	V	X
adopted centre pixel position in T/S Y	\	\	›	\	V	›	X	(	X	X	X	›	X	›	X	›	X	›	X	›	X	›	X	\	V	\	V	\	V	\	V	\	V	\	V	\	V	\	V	›	X	›	X	V	V	V	X	V	X
adopted centre pixel position in T/S Z	\	\	›	\	V	›	X		X	X	X	›	X	›	X	›	X	›	X	›	X	›	X	\	V	\	V	\	V	\	V	\	V	\	V	\	V	\	V	›	X	›	X	V	V	V	X	V	X
Integration time	\	\	›	\	V	\	V	[	X	X	X	\	V	\	V	\	V	\	V	\	V	\	V	\	V	\	V	\	V	›	X	\	V	\	V	\	V	\	V	\	V	\	V	V	X	V	X	V	V
Pixel ID 1	\	\	›	\	V	›	X	(	X	X	X	›	X	›	X	›	X	›	X	›	X	›	X	\	V	\	V	\	V	\	V	\	V	\	V	\	V	\	V	\	V	\	V	V	V	V	X	V	X
Pixel ID 2	›	\	›	›	X	›	X	l	X	X	X	›	X	›	X	›	X	›	X	›	X	›	X	›	X	›	X	›	X	›	X	›	X	›	X	›	X	›	X	›	X	›	X	X	X	V	X	V	X
lab temperature	\	\	›	\	V	›	X	(	X	V	X	›	X	›	X	›	X	›	X	›	X	›	X	\	V	\	V	\	V	\	V	\	V	\	V	\	V	\	V	\	V	\	V	V	V	V	X	V	X
lab humidity	\	\	›	\	V	›	X	t	X	V	X	›	X	›	X	›	X	›	X	›	X	›	X	\	V	\	V	\	V	\	V	\	V	\	V	\	V	\	V	\	V	\	V	V	V	V	X	V	X
BSM chop frequency	›	\	›	\	V	›	X	(	X	X	X	›	X	›	X	›	X	\	V	›	X	›	X	›	X	›	X	›	X	›	X	›	X	›	X	›	X	›	X	›	X	›	X	X	X	V	X	V	X
Peakup OBSID	›	\	›	\	V	›	X	(	X	X	X	›	X	›	X	›	X	›	X	›	X	›	X	\	V	\	V	\	V	\	V	\	V	\	V	\	V	\	V	›	X	›	X	V	V	V	X	V	X
SMEC encoder position	›	›	›	›	V	›	V		X	X	X	›	X	›	V	›	X	›	X	›	X	›	X	›	V	›	V	›	V	›	V	›	V	›	V	›	V	›	V	›	V	›	V	V	X	V	X	X	X
SMEC LVDT position	›	›	›	›	V	›	V		X	X	X	›	X	›	V	›	X	›	X	›	X	›	X	›	V	›	V	›	V	›	V	›	V	›	V	›	V	›	V	›	V	›	V	V	X	V	X	X	X

Sub-array ID	›	›	›	›	X	\	V	[	X	X	X	\	V	\	V	›	X	›	X	›	X	›	X	›	X	›	X	›	X	›	X	›	X	›	X	›	X	›	X	›	X	›	X	X	X	X	X	X	X
PCAL command current	›	›	›	›	X	\	V	ε	X	X	X	›	X	›	X	›	X	›	X	›	X	›	X	›	X	›	X	›	X	›	X	›	X	›	X	›	X	›	X	›	X	›	X	X	X	X	X	X	X
PCAL current	›	›	›	›	X	\	V	l	X	X	X	›	X	›	X	›	X	›	X	›	X	›	X	›	X	›	X	›	X	›	X	›	X	›	X	›	X	›	X	›	X	›	X	X	X	X	X	X	X
PCAL bias voltage	›	›	›	›	X	\	V	ε	X	X	X	›	X	›	X	›	X	›	X	›	X	›	X	›	X	›	X	›	X	›	X	›	X	›	X	›	X	›	X	›	X	›	X	X	X	X	X	X	X
SCAL2 command current	›	›	›	›	X	›	X	t	V	V	V	›	X	›	X	›	X	›	X	›	X	›	X	›	X	›	X	›	X	›	X	›	X	›	X	›	X	›	X	›	X	›	X	X	X	X	X	X	
SCAL2 current	›	›	›	›	X	›	X	ε	V	V	V	›	X	›	X	›	X	›	X	›	X	›	X	›	X	›	X	›	X	›	X	›	X	›	X	›	X	›	X	›	X	›	X	X	X	X	X	X	X
SCAL2 bias voltage	›	›	›	›	X	›	X	(	V	V	V	›	X	›	X	›	X	›	X	›	X	›	X	›	X	›	X	›	X	›	X	›	X	›	X	›	X	›	X	›	X	›	X	X	X	X	X	X	X
SCAL4 command current	›	›	›	›	X	›	X		V	V	V	›	X	›	X	›	X	›	X	›	X	›	X	›	X	›	X	›	X	›	X	›	X	›	X	›	X	›	X	›	X	›	X	X	X	X	X	X	X
SCAL4 current	›	›	›	›	X	›	X	[	V	V	V	›	X	›	X	›	X	›	X	›	X	›	X	›	X	›	X	›	X	›	X	›	X	›	X	›	X	›	X	›	X	›	X	X	X	X	X	X	X
SCAL4 bias voltage	›	›	›	›	X	›	X	ε	V	V	V	›	X	›	X	›	X	›	X	›	X	›	X	›	X	›	X	›	X	›	X	›	X	›	X	›	X	›	X	›	X	›	X	X	X	X	X	X	X
SMEC scan velocity	›	›	›	›	X	›	X	l	V	V	V	›	X	›	X	›	X	\	V	›	X	›	X	›	X	›	X	›	X	›	X	›	X	›	X	›	X	›	X	›	X	›	X	X	V	X	V	X	X
SMEC scan range	›	›	›	›	X	›	X	ε	V	V	V	›	X	›	X	›	X	\	V	›	X	›	X	›	X	›	X	›	X	›	X	›	X	›	X	›	X	›	X	›	X	›	X	X	X	X	V	X	X
No. of SMEC scans	›	›	›	›	X	›	X		V	V	V	›	X	›	X	›	X	\	V	›	X	›	X	›	X	›	X	›	X	›	X	›	X	›	X	›	X	›	X	›	X	›	X	X	V	X	V	X	X
Microphonic Vibrator setting	›	›	›	›	X	›	X	t	X	X	X	›	X	›	X	\	V	›	X	›	X	›	X	›	X	›	X	›	X	›	X	›	X	›	X	›	X	›	X	›	X	›	X	X	X	X	X	X	X
Polariser setting	›	›	›	›	X	›	X	ε	X	X	X	›	X	›	X	\	V	›	X	›	X	›	X	\	V	›	X	›	X	›	X	›	X	›	X	›	X	›	X	›	X	›	X	X	X	X	X	X	X
Beam attenuation	›	›	›	›	X	›	X	(	X	X	X	›	X	›	X	›	X	›	X	›	X	›	X	›	X	\	V	\	V	›	X	›	X	›	X	›	X	›	X	›	X	›	X	X	X	X	X	X	X
FTS Scan speed	›	›	›	›	X	›	X		X	X	X	›	X	›	X	›	X	›	X	›	X	›	X	›	X	›	X	›	X	\	V	›	X	›	X	›	X	›	X	›	X	›	X	V	X	X	X	X	X

FTS Scan range	›	›	›	›	X	›	X		X	›	X	›	X	›	X	›	X	›	X	›	X	›	X	›	X	›	X	›	X	\	V	›	X	›	X	›	X	›	X	›	X	›	X	V	X	X	X	X	X
No. FTS Scans	›	›	›	›	X	›	X		X	X	X	›	X	›	X	›	X	›	X	›	X	›	X	›	X	›	X	›	X	\	V	›	X	›	X	›	X	›	X	›	X	›	X	V	X	X	X	X	X
Edge Filter Position	›	›	›	›	X	›	X		X	X	X	›	X	›	X	›	X	›	X	›	X	›	X	›	X	›	X	›	X	›	X	\	V	›	X	›	X	›	X	›	X	›	X	X	X	X	X	X	X
Pupil ?	›	›	›	›	X	›	X		X	X	X	›	X	›	X	›	X	›	X	›	X	›	X	›	X	›	X	›	X	›	X	›	X	›	X	›	X	\	V	›	X	›	X	X	X	X	X	X	X
Pupil F	›	›	›	›	X	›	X		X	X	X	›	X	›	X	›	X	›	X	›	X	›	X	›	X	›	X	›	X	›	X	›	X	›	X	›	X	\	V	›	X	›	X	X	X	X	X	X	X

Notes:

1. Not useful for load curve tests