SUMMIT pipeline summary

Aim:
Produce a "high" quality calibrated image from science data using as much data as possible

How:
Pipeline waits until
- observation is 90% complete, or
- scan pattern complete, or
- the time elapsed since a map was made previously exceeds a limit, or
- observation completes

Notes
- In practice a new map is usually made every 2 to 10 minutes, depending on observation type (DAISY maps made more often)
- New data will arrive as a map is being made and the pipeline will process all of the new data once the map is made (no data are omitted)
- Uses the default dimmconfig.lis config file
  - calibrators use dimmconfig_bright_compact.lis
  - pointing/focus use specialized configs optimized for the SUMMIT pipeline
- Creates a co-added image as the observation progresses (if applicable) and coadds images across observations to improve signal-to-noise
- Applies most recent flatfield to new raw data if not making a map this time round (saves some time when map-making)
- Displays most recent map and coadd using Gaia (updated when new map is made)
- Pointing and focus maps and all focal-plane mosaics are displayed using Kapview (KAPPA display)
- Calculates pointing and focus offsets (but these are not used by the TSS)
- Maps calibrated in mJy/beam using default FCFs
- FCFs are calculated from observations of calibrators for comparison
- Tonight page shows most recent map and updated coadd

Where:
- 450 um: sc2dr1
  - /jcmtdata/reduced/dr1/scuba2_450/YYYYMMDD
- 850 um: sc2dr3
  - /jcmtdata/reduced/dr3/scuba2_850/YYYYMMDD
Output files:

Maps

- `sYYYYMMDD_NNNNN XXX_cal.sdf`
  - most recent map for current observation
- `gsYYYYMMDD_NN_XXX_mos.sdf`
  - coadded map for current target (may include data from multiple observations)
  - NN will be the number of the first observation in the coadd
- `sYYYYMMDD_NNNNN XXX_reduced.sdf`
  - most recent map for pointing source
- `gsYYYYMMDD_NN_XXX_reduced.sdf`
  - coadded map for pointing source
- `gsYYYYMMDD NN_XXX_foc.sdf`
  - output cube from focus observations (Az-El-SMU, viewable in Gaia)
  
  Where YYYYMMDD is the current UT date, NNNNN is the zero-padded observation number (e.g. 00036), NN is the non-zero padded observation number (e.g. 36) and XXX is the wavelength (either 850 or 450). The "g" prefix indicates a "group" product.

Logfiles

- `log.noise`
  - estimate of noise (mJy/beam) in current group coadd
- `log.nefd`
  - estimate of NEFD, effective NEFD and extrapolated zenith NEFD (in mJy/beam.√s) from current map
- `.oracdr_PID.log`
  - Pipeline log file (PID is the ORAC-DR process ID)
- `log.fcf`
  - Flux conversion factors derived from calibrators
- `log.beam`
  - Beam size derived from fits to calibrators
- `log.pointing`
  - Pipeline estimate of pointing offsets (arcsec)
- `log.focus`
  - Pipeline estimate of best-fit SMU position
- `log.bolonoise`
  - Bolometer noise (in pA/√Hz) and effective NEP (in W/√Hz)
- `log.flatfield`
  - Responsivity statistics from flatfield solutions (A/W)
Other data files

- `sYYYYMMDD_NNNNN_SSSS_XXX_respmos.sdf`
  - responsivity focal-plane mosaic (flatfield)
- `sYYYYMMDD_NNNNN_SSSS_XXX_noimos.sdf`
  - time-domain noise (2–10 Hz) focal-plane mosaic
- `snxYYYYMMDD_NNNNN_SSSS_flat.sdf`
  - flatfield solution (1 per subarray)
- `snxYYYYMMDD_NNNNN_SSSS_rawflat.sdf`
  - raw flatfield for use in map-making

Where (as before)

- `YYYYMMDD` = current UT date
- `NNNNN` = zero-padded observation number
- `SSSSS` = zero-padded subscan number
- `XXX` = wavelength
- `snx` = subarray identifier (e.g. `s8a`)

Monitoring the pipeline

- Important/useful results in **green** (some in **yellow**)
  - number of bolometers from flatfield
  - pointing/focus estimates
  - NEFD
- Warnings in **cyan**
- Errors in **red**
- Watch for:
  - large changes in the number of bolometers
  - blank pixels at the source centre (pointing/focus)
  - FCFs wildly different from defaults and/or discrepant effective beam areas
  - number of bolometers in map
  - map appearance - streaks, obvious patterns