Reprocessing Scan Maps

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on behalf of the SPIRE ICC

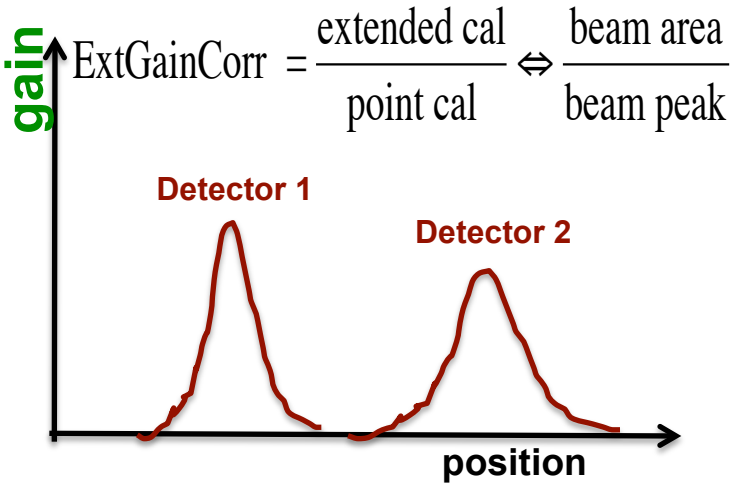
When do I need to reprocess my SPIRE maps?

- **Maps of extended sources:**
  Applying the extended gain correction (not included in standard pipeline) may improve a map of extended emission (e.g. star formation regions) significantly.
- **Maps with stripes:**
  - "Cooler burp" effect (uncorrected in standard pipeline)
  - Missed thermistor jumps
- **Problem that won't be solved by reprocessing:**
  - Telemetry drop off
  - Stray light due to nearby bright sources
  - Data saturation

Destriper + Extended Gain Correction

• Extended Gain Correction:

The correction is the ratio between calibrations for extended sources and for point sources. Since this ratio is different for different detectors, the correction has to be applied to Level-1 timelines of individual detectors. Then, new maps shall be made using these corrected timelines.



Without the correction:

With the correction:

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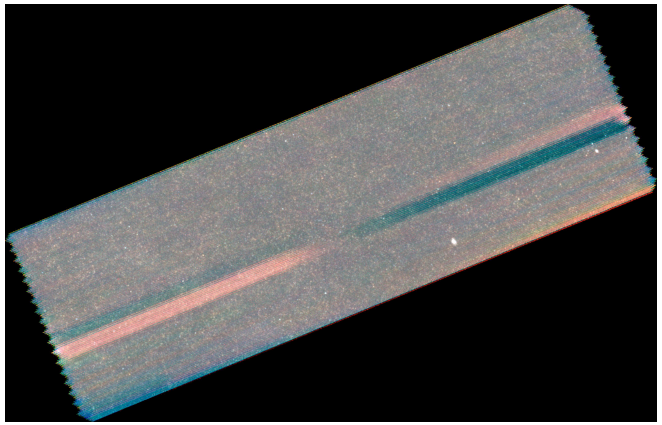
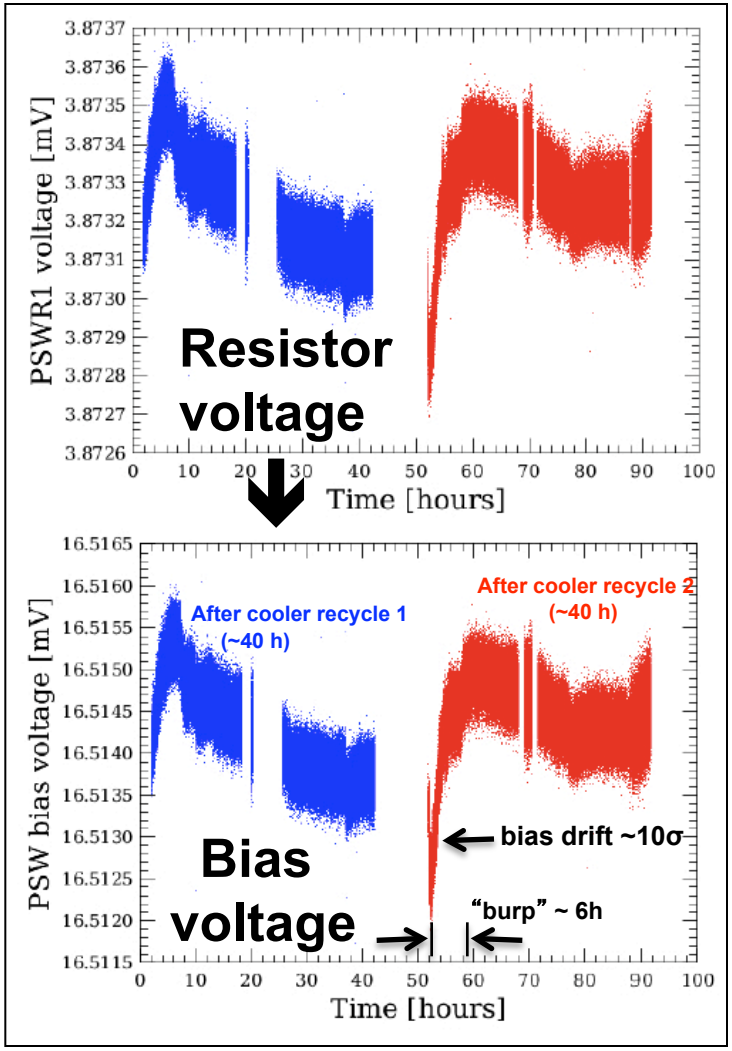
"Cooler Burp"

- Every time when SPIRE is switched on after a cooler recycle, the first ~6 h sees a rapid drift of the bias voltage.
- It causes abnormal drifts in detector timelines, which in turn cause stripes in maps observed during the "cooler burp" period.

An example of stripes caused by cooler burp:





- In user pipeline, there is an optional module for the correction of this effect.

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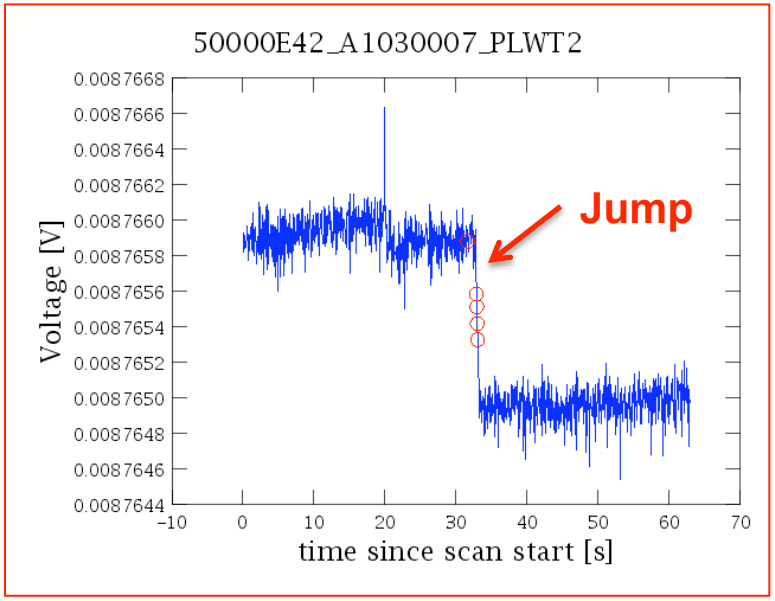
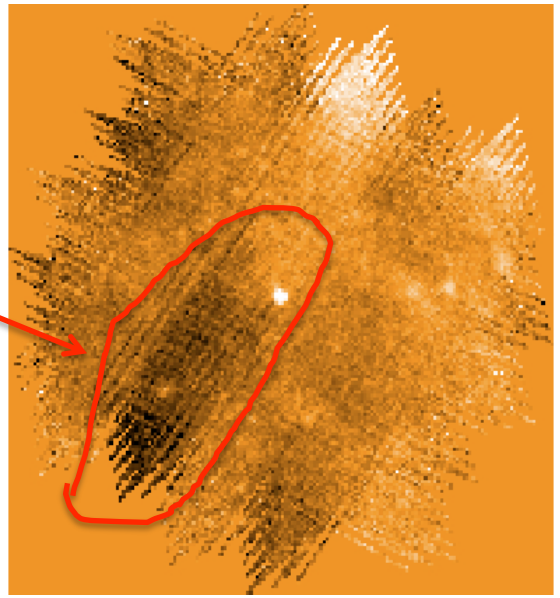
Thermistor Signal Jump

- Sudden (spontaneous?) jump in a thermistor timeline.
- The average frequency is ~ 1/day.
- Effect: The pipeline uses thermistor timelines in the correction for detector signal drift due to temperature drift. A thermistor "jump" affects this correction, introducing artificial stripes in the final map.





- The automatic thermistor jump detector in the pipeline has a failure rate of ~ 3%.
- If you see a broad stripe such as that in the example, you need to reprocess the data (mask the affected thermistor manually).

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