SQWG
L1 reprocessing V8.01
Analysis of unprocessed L1 products

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Outline

Overview: number of unprocessed orbits and reasons

Suggestions for fixing missing orbits

Analysis Procedure

- processing on development computers (Xeon 2.6 GHz with 32 GB RAM) in a script with foreach loop
- counting unique error messages in the log-file
- counting succesfully generated level-1b products
- Some processes fell into endless sleep and didn't return to the calling script
- So running a script in parallel which kills processes with CPU workload < 5%

Counts of successes and failures

- total unprocessed files : 774 (evenly spread over the years)
- total files flagged by SOST Level-0 quality check: 217
  (wrong sync word, file too small, etc)
- total processed (successful generation of L1b on node with 32 GB): 164
- total processed but failed due to errors: 313
- (the rest (297): crash without error message or process sleeping endlessly or level-0 too small or too big (> 600 MB))

Various error messages

- IT (Integration Time) is not a multiple of small IT : 65
- indizes do not match: icoadall >= nTotalCoaddings, is a packet missing ? : 8
- error in converting time : 6
- no azimuth scanner position provided : 87
- Unknown ISP ! : 180
- the BCPS xyz in mode n is bigger than the maximum BCPS (state duration) xxx : 16
- skipping calculation of sums : 65
- total orbits with error messages (not the sum of counts above) : 313

Causes of error messages

- Integration times are not multiples of a smaller time: no software co-adding possible (co-adding needed for straylight and polarisation calculation)
- Auxiliary packets (PMD, scanner positions) missing
- Downlink damaged

Very big and very small files

- Files bigger than 500 MB: 13
  - Files bigger than 1 GB: 7
- Files smaller than 100 MB: 49
  - Files smaller than 50 MB: 28
  - Files smaller than 3 MB: 5

Summary of reprocessing

- 47503 of 48277 orbits successfully processed.
- Remaining orbits failed due to two reasons:

  1. Because processor holds all data in memory it needs 8 GB RAM. Some processes ran out of memory on the compute nodes with 8 GB RAM.
  2. The rest failed due to Level-0 problems. Many of them can be jumped over by the processor. Therefore some error handling code needs to be added.

Suggestions for fixing orbits

- States causing error messages: catch error situation, skip and mark state unprocessable in Level 1b product. Source code update necessary (error handling code).
- Damaged Level-0 products (unknown ISP, difficult to jump over) : leave unprocessable (difficult to resync but possible). Scientific quality check necessary (are the data reliable ?).
- Files which failed due to insufficient memory and have been succesfully reprocessed on development computers: can they be added to the official data set ?
- Files with huge size (1 GB) due to level-0 inconsistencies: can they be reconsolidated ? (we have tools for cutting/assembling level-0 products) Or shall we leave them unprocessed ?
- Very small files: Generation of small level-1b product is mostly possible. To be decided (do we accept small Level-1b products ?)