SLSTR L1 & marine L2 products

SLSTR instrument

- Sentinel-3 SAFE:
  - Standard Archive Format for Europe (SAFE), specific to Sentinel-3 and to SLSTR/OLCI/SRAL
  - Designed to act as a common format for archiving and conveying data within the European 3D orbitring capabilities
  - Designed to be compliant with Open Archival Information System (OAIS)
  - Designed to meet the requirement of various data users (e.g. IFREMER)
  - Reflects the KDDA specifications for specific calculation in the 3D domain of KDDA (EGADS 61-1-9-1-3, Blue Book, 2008)

- SLSTR file name convention

MMNN__SS__TTTTTT__DATA__START__DATA__STOP__<CREATION__TIME__filename__DDG__RADD__all_data.txt

The European Space Agency; The European Commission Copernicus Programme; The Space Agency; IFREMER; IFREMER, 38 Rue du Port Blanc, 95000 Fontaine, France

SLSTR SAFE readers

Python

Carbon: Fire and open source python modules for the ingestion, registration, and writing of primary source production data into a SAFE file

Sentinel Application Platform (SNAP)

http://step.esa.int/main/toolboxes/snap/

SLSTR L2 SST algorithms

- N2 – across-track single-view day-time retrieval (3.7 μm and along-track view are unused)
- N3 – across-track single-view night-time (along-track view unused)
- D2 – dual-view day-time (3.7 μm and 1.37 μm)
- D3 – dual-view night-time (all channels used)
- N3R – N3 with SST retrieval coefficients robust to stratospheric aerosol loading events (major volcanic eruptions)
- NIR – SST retrieval coefficients (also from missing or invalid data in the L0 format)

The dependence of the choice of SST algorithm on the presence of desert dust or stratospheric aerosol, the across-track swath position and the solar geometry in the two instrument views.

SLSTR image grids

- Geolocation: computing the orthorectification (i.e. longitude, geodetic latitude both corrected for the Digital Elevation Model (DEM)), and altitude with the reference ellipsoid (WGS84) and corresponding (x,y) cartesian coordinates of the center of each instrument pixel for each view and three of the four grids defined in SLSTR L1b products:
  - 1km grid for TIR and fire channels
  - 0.5km grid stripe A for Visible/NIR and SWIR channels
  - 0.5km grid stripe B for SWIR channels only
- all parameters indexed on image grid – continuity req.
- remapping from instrument curved scans to uncurved grid in quasi-Cartesian system uses the nearest neighbor method with retaining pixels that are not used (i.e. orphan)
- remapping keeps original pixel positions (nearest method) therefore image grid does not look so regular close to swath edge (oblique view and swath edge)
- using image and detectors, and cosmetic fill pixels

Instrument → image grid

- Duplicate pixel
- Non-duplicate pixel
- Optional pixel

The change in coordinate system from the pixel calculated from missing or invalid data in the L0 format
- The SLSTR scan has been optimized to allow a complete observation of the two IBs and the VIS orbitation unit every two scans (6.5 s) and the acquisition of both Earth views (near and oblique) every scan (6.5 s)
- Because of the larger swath widths of the SLSTR, the scan period was increased to 360 ms, compared to 250 ms for AATSR
- This choice also reduces the scan speed to 200 rpm (instead of 400 rpm of AATSR)
- Allowing heritage mission qualifications to cover the 7.5 years operation requirement for the scanner bearing lifetime
- However it is necessary to continuously scan on the ground along track TIR of 2 km (satellite speed of 7.6 km/s) by means of two 1 km-RD VI and BD detector pixels and four 0.5 km-RD VI/SWBD detector pixels (instead of 3 of AATSR)

Instrument → image grid

- Procedure remaps the measured radiard and along-track instrument pixels from their positions on the curved instrument scan to a uniform grid of points in the common quasi-Cartesian co-ordinate system
- It uses a nearest neighbor method. No pixels that are not used (i.e. orphan pixels)
- In艺 order to obtain orphan pixel are stored not matter - associated indices are used in the image grid of each orphan pixel.
- The detectors from the sensors are interleaved in a quasi-random fashion determined by effect of the wobble of the spacecraft and surface topology on the L1b remapping process.