

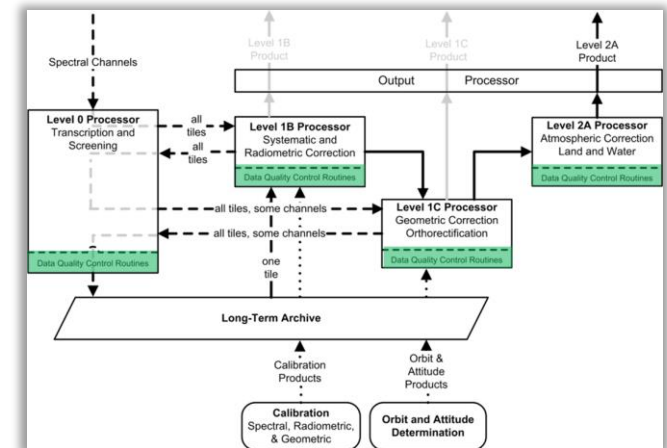
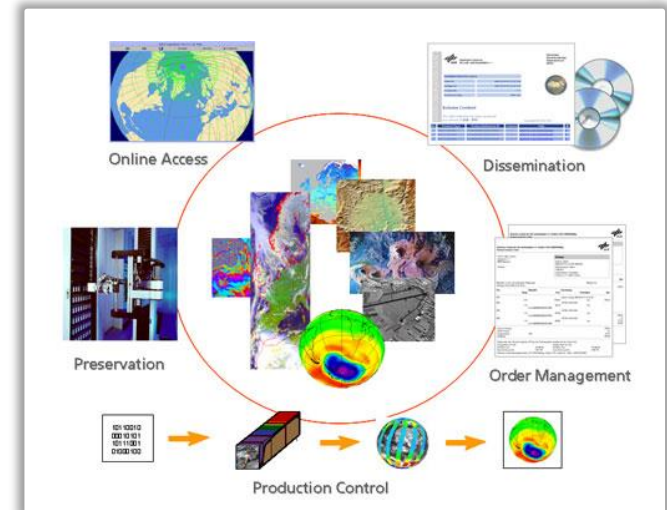
EnMAP ARD / CARD4L Metadata

Martin Bachmann et al., DLR
for the EnMAP Ground Segment

Overview

- DLR's multi-mission infrastructure „DIMS“
 - Incl. TerraSAR-X, ENVISAT and others
 - GEOSERVICE: ISO19115 & INSPIRE
 - Current topics: ARD-compliant hosting of S-1 & S-2 archives

- EnMAP – German Hyperspectral Mission
 - COPERNICUS contributing mission
 - Launch: Q1 2022
 - Processing up to L2A (ortho-rectified BOA reflectance)
 - L2A: tiled products, 218 bands
 - Processing similar to DESIS @ ISS
 - Complete sample products available:
https://www.enmap.org/data_tools/testdata/



EnMAP – Product Specifications & Metadata

- Archived product: L0+ incl. metadata up to L2A
- L1B, L1C, L2A (land & water) user product generation on demand
- L2A product: Databcube + Quicklooks + 8 QualityLayers + XML Metadata
- **CARD4L-SR (V.5.0) is suitable for hyperspectral data**



EnMAP Ground Segment
EnMAP HSI Level 1 / Level 2 Product
Specification Document

Doc. ID EN-PCV-ICD-2009-2
Issue 1.5 excerpt and draft
Date 30.11.2018
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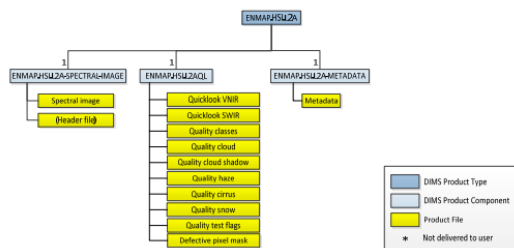


Figure 3-3 L2A product files.

@ L0, L1B, L1C, L2A:

Layers:

- Quicklooks (VNIR, SWIR)
- Classification
- Cloud
- Cloud shadow
- Haze
- Cirrus
- Snow
- QC flags (sat., strip., quality)
- Defective Pixel Mask

Metadata:

- Data Quality
- Geo. accuracy (matching)
- Atm. conditions
- ...

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ENMAP.HSI.L2A-SPECTRAL_IMAGE	Earth image measurement data covering 1 tile (30x30km) in orthorectified geometry	ENMAP01-__L2A-DTnnnnnnnn_yyyymmddThhmssZ_nnn_Vnnnnn_nn_yyyymmddThhmssZ_SPECTRAL_IMAGE(.TIF,BSQ,BIP,BIL,JPEG2000)	tif, bsq, bip, bil, jpeg2000 (selectable by user)	<639 MB
		ENMAP01-__L2A-DTnnnnnnnn_yyyymmddThhmssZ_nnn_Vnnnnn	Envi header file (only for	10 KB

Obstacles reg. full „target“ conformity

- Auxiliary information (esp. reference image, DEM + derivatives) partially commercial
- Traceability of instrument lab. calibration would require industry commitment / likely change of contracts
- Parts of the geo/spec/rad calibration information is provided within metadata (RPCs, spectral smile)...
- ... other parameters (esp. straylight) too exhaustive to be provided
- In-orbit radiometric performance will be documented within publications, uncertainty budget @ L2A in development

Summary Self-Assessment Table

	Threshold	Target
1. General Metadata		
1.1 Traceability	n.a.	no
1.2 Metadata Machine Readability	ok	ok
1.3 Data Collection Time	ok	no
1.4 Geographical Area	ok	ok
1.5 Coordinate Reference System	ok	ok
1.6 Map Projection	ok	ok
1.7 Geometric Correction Methods	n.a.	ok
1.8 Geometric Accuracy of the Data	n.a.	ok
1.9 Instrument	ok	ok
1.10 Spectral Bands	ok	ok
1.11 Sensor Calibration	n.a.	no
1.12 Radiometric Accuracy	n.a.	no
1.13 Algorithms	ok	partially
1.14 Auxiliary Data	ok	no
1.15 Processing Chain Provenance	n.a.	no
1.16 Data Access	ok	ok
1.17 Overall Data Quality	n.a.	ok
2. Per-Pixel Metadata		
2.1 Metadata Machine Readability	ok	ok
2.2 No Data	ok	ok
2.3 Incomplete Testing	ok	ok
2.4 Saturation	ok	partially
2.5 Cloud	ok	ok
2.6 Cloud Shadow	ok	ok
2.7 Land/Water Mask	n.a.	ok
2.8 Snow/Ice Mask	n.a.	ok
2.9 Terrain Shadow Mask	n.a.	no
2.10 Terrain Occlusion	n.a.	no
2.11 Solar and Viewing Geometry	ok	no
2.12 Terrain Illumination Correction	n.a.	no
2.13 Aerosol Optical Depth Parameters	n.a.	tbd
3. Radiometric and Atmospheric Corrections		
3.1 Measurement	ok	no
3.2 Measurement Uncertainty	n.a.	partially
3.3 Measurement Normalisation	n.a.	no
3.4 Directional Atmospheric Scattering	ok	ok
3.5 Water Vapour Corrections	ok	ok
3.6 Ozone Corrections	n.a.	ok
4. Geometric Corrections		
4.1 Geometric Correction	ok	ok