The GOME-2 instrument on MetOp...

Satellites, launch dates

Orbit
Polar, 750 km altitude, 26° inclination

Wavelength range
400–800 nm, 10 channels

Spectral resolution
FWHM: 2–6.5 nm (main channels)

Swath width
Depth: 1500 km, 800 km (strip)

Data rate
400 kbit/s or 360 Mbit/orbit

Commissioning 1: In-orbit verification

Main purpose
- Verify instrument complies to its requirements
- Compare in-flight to pre-flight performance
- Optimize timing and control parameters

Timing
- Launch: 1 week to Launch + 8 weeks

Areas covered
- Thermal, power, functional, performance
- Earth radiances

Reference data
- Requirements and pre-flight measurements

Analysis tools
- GPP, DABP
- Participants: ESA, EUMETSAT, Galicia Avionica, TPD

Mode
- Performance parameters checked

- Temporal accuracy, signal and noise, cross talk, light tightness
- LED
- Pixel-to-pixel gain variation, saturation, linearisation
- SLS
- Dispersion, spectral alignment/resolution/stability
- SLS via diffuser
- Sun
- Diffuser reflectivity

Commissioning 2: Validation

Main purpose
- Ensure that products satisfy the EPS End User Requirements and continuously improve to satisfy the evolving state of the art user requirements

Timing
- Launch + 8 weeks to Launch + 6 months
- Continuing with long-term validation activities

Areas covered
- Level 2 validation including feedback

Analysis tools
- GOMSFA, O3MSAF, O3MSAF on-line services

Participants
- EUMETSAT (lead), ESA, O3MSAF, additional scientific support as necessary

Level 1 Verification, Confirmation and Validation
GOME-2 level 1 products cannot be fully validated without feedback from the validation of level 2 products. A preliminary validation of the earthshine radiance measurements and albedo can be achieved by cross-checking the O3MSAF suite of tools: the main level 0–1 processor, offline tools for data visualisation, long-term monitoring and product quality statistics, and auxiliary tools. The main level 0–1 processor and the O3MSAF suite have been tested against each other. The main level 0–1 processor and the O3MSAF suite have been tested against each other.

Additional references
- Galicia Avionica, TPD (support), GMV (support)

Level 1 to 2 Ground Processor Prototype (GPP)
- A stand-alone level 0–1 processor has been developed at GMV. Initially primarily intended to be a testbed for algorithm development and creation of a reference test data set for the operational algorithms, it was subsequently made operational in a multi-platform suite of tools: the main level 0–1 processor, offline tools for data visualisation, long-term monitoring and product quality statistics, and auxiliary tools. The main level 0–1 processor and the O3MSAF suite have been tested against each other.

Level 2 Validation
Level 2 Validation of these products will be primarily based on comparison with other independently validated spatial and temporally collocated measurements. Sources of independent validation data sets include ground-based data, satellite-based data, aircraft- and balloon-based data. Validation of atmospheric constituent retrievals will be carried out at EUMETSAT in support of level 1 validation activities. Additionally, the O3MSAF suite provides validation services for automated comparisons of level 2 data products with measurements from selected ground-based stations. Feedback from the scientific community is also expected to provide valuable information.

Long-term monitoring

Main purpose
- Monitor instrument performance
- Condense and statistically analyse monitoring data

Instrument lifetime
- Level 2 products, in-flight calibration parameters

Data processing: Implementation

Level 1 to 1 Ground Processor Prototype (GPP)
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References
- The Second Global Ozone Monitoring Experiment (GOME-2) for...