AEOLUS
3rd ANNIVERSARY CONFERENCE
28.03–01.04 2022
TAORMINA, ITALY
The Aeolus Payload Data Ground Segment:
first 3+ years of Near Real Time operations

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MISSION REQUIREMENTS

**MR-10:** ESA shall implement NRT delivery of L1b data to users, delivery of a L2B processor and L2A, L2B, L2C, calibration and auxiliary products […]

**MR-140:** The mission shall ensure **L1B data delivery (timeliness) within 3 hours of sensing**, in particular for the areas influencing European weather on short range (12-72 hrs)

**MR-150:** The mission shall ensure a horizontal track wind observation **data availability of at least 95%** within a repeat cycle during routine operation in phase E2

**MR-160:** The mission dataset length shall be at least 3 years
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Aeolus Payload Data Ground Segment

- Acquisition Service
  - Svalbard
  - Troll
  - Downlink Plan
  - VCO/1/2 Files

- KSAT NW
  - Processing Facility (APF) Transmission
  - L0/1/2 products
  - Aux Files Monitoring Files

- EO NW
  - Dissemination Facility (ADDF) Amsterdam
  - L0/1/2 products
  - Monitoring Files
  - Reference Archive ADS Luxembourg, Nice

- L2/MET Processing Facility Reading
  - L1/2 products
  - Aux Files Monitoring Files

- X-Band TM

Preservation Element
- ESRIN - Frascati
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Aeolus PDGS Operations: Overview

- Aeolus PDGS operations outsourced to European industry
- Operations ensured through network of tailored operational services and collaboration of specialised teams
- PDGS Operation management at ESA-ESRIN
- Selected core tasks under direct ESA management: Mission Planning, PDGS validation and deployment management
- COSA service (KSAT): x-band data acquisition; systematic generation of L0/L1A/L1B/L2A data, dissemination of L1B data to ECMWF for further processing
- DAMI service (ECMWF): systematic generation of L2B + AUX MET/TEL data; Aeolus assimilation into medium range weather forecast model (L2C generation), L2B distribution to Eumetsat
- DISC (Consortium/DLR): Data quality and improvement
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Aeolus COSA Service/KSAT:

- Combined usage of Svalbard and Troll X-band stations ensures global NRT data coverage (111 passes/week: 74 Svalbard, 37 Troll)
- A new dedicated antenna built at Troll for the Aeolus mission (1st pass 20th March 2019)
- Systematic processing of L0/L1B/L2A data and dissemination of L1B to ECMWF for further processing
- 24/7 support and monitoring of acquisition and processing

COSA Service website: https://www.ksat.no/cosa
L2B wind observations have operationally been assimilated in ECMWF LWDA (Long-Wind Data Assimilation)
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Mission Timeline (2018-2020)

- **Aeolus Launch**
  - 22 Aug 2018

- **FM-A Switch On**
  - 31 Aug 2018

- **Aeolus Start Mission**
  - 17 Aug 2018

- **Baseline-1**
  - 15 Oct 2018

- **Baseline-2**
  - 16 May 2019

- **Baseline-3**
  - 24 Jun 2019

- **Baseline-4**
  - 05 Sept 2019

- **Baseline-5**
  - 05 Mar 2020

- **Baseline-6**
  - 20 Apr 2020

- **Baseline-7**
  - 12 May 2020

- **Baseline-8**
  - 30 Sept 2020

- **Baseline-9**
  - 09 Jul 2020

- **Baseline-10**
  - 11 Oct 2020

- **Baseline-11**
  - 19 May 2020

- **First Planning**
  - 21 Jun 2019

- **First Wind Measurement**
  - 28 Jun 2019
  - 13:54:23

- **ESA L1B/L2B NRT public data release**
  - 12 May 2020

- **EUMETCast distribution of Aeolus data**
  - 19 May 2020

- **ECMWF starts the operational use of Aeolus data**
  - 03 Mar 2020

- **Meteo-France starts operational use of Aeolus data**
  - 30 Jun 2020
Mission Timeline (2021-2022)
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Aeolus Data Access Points

Aeolus Data Dissemination Server (public: L1B/L2A/L2B/L2C + AUX inputs for L2B processing):
https://aeolus-ds.eo.esa.int/oads/access/

Aeolus VirES: https://aeolus.services/

ECMWF pick-up point: Aeolus NRT L2B data in BUFR format: https://acquisition.ecmwf.int/index.html
1295 days generated the following **numbers** of a consistent, consolidated and validated set of data records which is declared as **Master**, i.e. usable for any future higher level re-processing campaign or future analysis.

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<th>Instrument</th>
<th>VC1</th>
<th>L0</th>
<th>L1A</th>
<th>L1B</th>
<th>L2A</th>
<th>L2B</th>
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**Master Archive datasets & Numbers**

- **FMA**: 284 days from 06/09/2018 to 17/06/2019
- **FMB**: 1011 days from 24/06/2019 to 28/03/2022

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*THE EUROPEAN SPACE AGENCY*
The overall acquisition proficiency covering the period June 2019 – February 2022 was 99.8%
99.56% of the L1B products have been systematically disseminated in less than 3 hours from sensing start time.

99.15% of the L2B products have been systematically disseminated in less than 3 hours from sensing start time.
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Aeolus Data Downloads per Month

- N. Downloaded Products
- N. Cumulative Downloads


Data categories: L0, L1A, L1B, L2A, L2B, L2C, TLMX, MPL, GRND_TRACK, AUX, Cumulative
Virtual Research Environment for Aeolus [Aeolus-VRE]

https://vre.aeolus.services

https://notebooks.aeolus.services
Mission Planning - Wind Timeline (2018-2022)
CONCLUSIONS

✓ Aeolus Ground segment operations ensured through network of tailored operational services and collaboration of specialised international teams
  ✓ Stable operations are a key facilitator of scientific results
✓ Operational mission objectives as per MRD fully met in 3+ years of Aeolus operations!
  ✓ Science telemetry availability: 99.8%
  ✓ Data NRT production/delivery performance:
    ✓ 99.5 % of L1B made available in (far) less than 3 hours
    ✓ 99.1 % of L2B BUFR made available within 3 hours
✓ PDGS achieved an impressive number of milestones in 3+ years (14 baseline deployments, 3 reprocessing campaigns, continuous Mission Planning operations), also taking advantage of the flexibility of the PDGS design and the relevant teams expertise
THANK YOU!