







Sentinel-6 mission overview

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Sentinel-6 Mission Overview

Status of Sentinel-6 Michael Freilich

Status and plans for Sentinel-6 B





Sentinel-6 Mission Overview

- Part of the European Union Copernicus Space Segment component
- Supporting Copernicus services: on Marine Environment Monitoring (CMEMS), and Climate Change (C3S)
- Cooperative mission, with contributions of ESA, NASA, EUMETSAT, NOAA and the support from CNES
- Continuation of the Global Mean Seal Level record initiated by TOPEX
- Continuation of the operational ocean altimetry services provided by Jason-3, in synergy with those from Sentinel-3
- Significant innovations at Space and Ground Segment levels



• Open Burst SAR (HR)

- Gives simultaneously conventional (LR) -> seamless transition from previous missions
- Digital altimeter architecture
 - Along with the high pulse repetition frequency, leads to very low noise
- HR and LR everywhere
 - Using on-board compression to provide HR and LR everywhere
- Climate quality by design
 - Stringent drift requirement (less than 1 mm/year) in EURD
- 1.5-centimeter NRT orbit accuracy on reference mission
 - Thanks to GNSS NRT processing on-ground (like Sentinel-3)
- Coastal focus on reference mission
 - Allowed by HR altimeter processing and HR Microwave Radiometer

Sentinel-6, an international partnership for Copernicus



EUM/JASCS/VWG/22/1334759, v1, 24 October 2022

Sentinel-6 Michael Freilich – High Precision Ocean Altimetry reference mission



Sentinel-6 Michael Freilich- important events and achievements

- ✓ The journey into operations was completed with the establishment as reference altimetry mission under CEOS in March, the release of the L2P/3 NRT/STC products in April, as well as of the first reprocessed data in July 2022
- ✓ Work ongoing to implement the improvements recommended in the commissioning
 - ✓ Baseline F07 in Sept 2022 (HRMR variables in MWR products, use of ECHO CAL, use of MOGF in NRT)
 - Baseline F08 soon to start end-to-end validation up to L2P (introduction of numerical retracker for LR) for re-processing in 2023
- ✓ L2P NTC products to be released in Nov, in line with the Entry of Service of the L3 NTC with S-6 Michael Freilich as reference mission in Dec 2022
- Sentinel-6 Validation Team continues to support these activities by providing valuable independent expert advice on the data quality (e.g. workshop in July 22 focusing on the re-processed data)
- ✓ In this Copernicus mission the partners have joint responsibility for the mission performance: the Mission Performance Working Group (NASA/ESA/NOAA/EUMETSAT/CNES) monitors the data and products quality and, together with the Project Scientists, steer evolutions and improvements of the overall mission value

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Sentinel-6 Michael Freilich – Space Segment and services availability



✓ Mission and service availability requirements are being met

- ✓ First Mission Performance Review planned in mid November
- ✓ Open access for all data check out EUMETSAT Data Centre and NASA/PODAAC presentation during this OSTST

Sentinel-6B satellite and launcher status



S-6B went into storage on 10 October 2022

Sentinel-6B Pre-Storage Acceptance Review completed successful in July 2022:

- Good qualification results of High Power Amplifier (HPA) on the Poseidon-4 instrument
- List of activities during and after storage agreed and documented
- Annual activations planned, De-storage in Q4 2024
- Comprehensive post-storage verification and Re-Acceptance Review in the first half of 2025, to declare satellite ready for shipping for a launch in November 2025
- NASA launcher procurement ongoing, confirmation of the launch vehicle and site expected in Q1 2023



Roadmap to launch and operations of Sentinel-6 B

- Tentative timeline of activities around an agreed launch for Sentinel-6B in Nov 2025
- Actual dates for de-storage and reacceptance activities will be tuned when \bullet the launcher vehicle and site is confirmed
- The duration of SatIOV and Commissioning will be adapted to the specific Sentinel-6 B relevant plans



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It is proposed to extend the mission by introducing a third satellite in the series (Sentinel-6C), as part of the Copernicus programme, using the same European – US partnerships as for Sentinel-6 Michael Freilich and Sentinel-6 B



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Conclusions and outlook

- Sentinel-6 is a cooperative mission within the EU Copernicus Programme, with contributions from ESA, NASA, EUMETSAT and NOAA and the support from CNES
- Focus is on continuation of the global mean sea level record and of operational ocean altimetry services in synergy with Sentinel-3, with important innovations at Space and Ground Segment levels
- Sentinel-6 Michael Freilich is currently the High Precision Ocean Altimetry reference mission under CEOS, with excellent performance and taking over from Jason-3
- Sentinel-6 Michael Freilich mission and service availability requirements are being met and improvements and evolutions highlighted during the Commissioning are being implemented as planned
- Sentinel-6 B is planned for launch in November 2025, the satellite is in storage and the launcher vehicle and site selection is ongoing
- A third satellite in the Sentinel-6 series is proposed under Copernicus, potentially extending the role of Sentinel-6 as High Precision Ocean Altimetry reference mission further up to 2036



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Thank you! Questions are welcome

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Sentinel-6 Michael Freilich- the journey into operations completed



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