

Geoid, Mean Sea Surface and Mean Dynamic Topography Splinter.

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Ocean Surface Topography Science Team Meeting (OSTST)

21-25 October, 2019
Chicago, Illinois

The banner features a timeline of ocean surface topography satellites orbiting Earth, with the Moon in the background. The satellites shown are:

- TOPEX/Poseidon (1992-2006)
- Jason 1 (2001-2013)
- OSTM/Jason 2 (2008)
- Jason 3 (2016)
- Sentinel-6A (2020)
- Sentinel-6B (2025)

Logos for the participating organizations are displayed at the bottom:

- cnes
- NASA
- EUMETSAT
- esa

1

Geoid/MSS/MDT recommendations for Jason-2 EoL(2016)

Considering the importance of Jason-2 EoL for geodetic applications and for

- Improving the MSS for further improving the quality of oceanographic/operational use of satellite altimetry.
- Improving the MSS in preparation for future high resolution missions (i.e., SWOT)

The Splitter recommends the following:

1. The Splitter encourages efforts to maximize the operating time of Jason-2 and the importance of completing at least 2 sub-cycles of 369 days or longer.

2. The OSTST stresses the importance to maximize coverage and precision even in the case of degradation of the accuracy.

3. The OSTST
minimize data

4. If Jason-2
cycle close to

5. Stressing

6. Stressing
hoc recommendation

**HUGE THANK TO THE SPACE AGENCIES
FOR PROVIDING SCIENTIST
WITH JASON-2 EOL MISSION**

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second sub-

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Presentations

Five Oral presentations

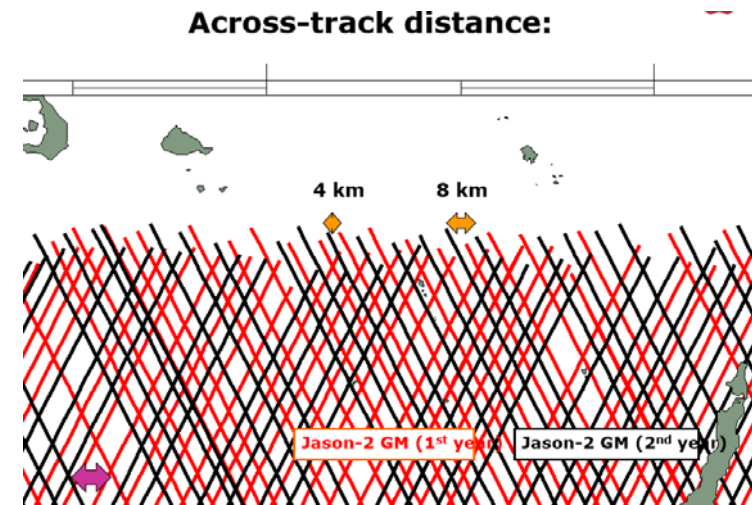
- Marine Gravity from the first two cycles of the Jason-2 LRO extension of Life mission (Andersen & Abulaitijiang)
- ESA's new satellite-only gravity field model via the direct approach (DIR-R6) (Bruinsma et al.)
- New CNES-CLS18 Mean Dynamic Topography of the global ocean from altimetry, gravity and in-situ data (Mulet et al)
- A new combined mean dynamic topography model – DTUHH19MDT (Knudsen et al,)
- Improvements and limitations of recent mean sea surface models: importance for Sentinel-3. (Pujol et al,)

Four posters:

- GOCE User Toolbox and Tutorial (Knudsen et al.)
- New CNES CLS 2019 mean sea surface: first validation (Schaeffer et al,)
- The new CNES CLS 2019 marine gravity anomaly model: first validation in the Mediterranean. (Schaeffer et al.),
- Geomed2: High-Resolution Geoid Models of the Mediterran (Bruinsma et al.,)

Andersen and Abulaitjiang: Marine Gravity from the first two cycles of the Jason-2 LRO extension of Life mission

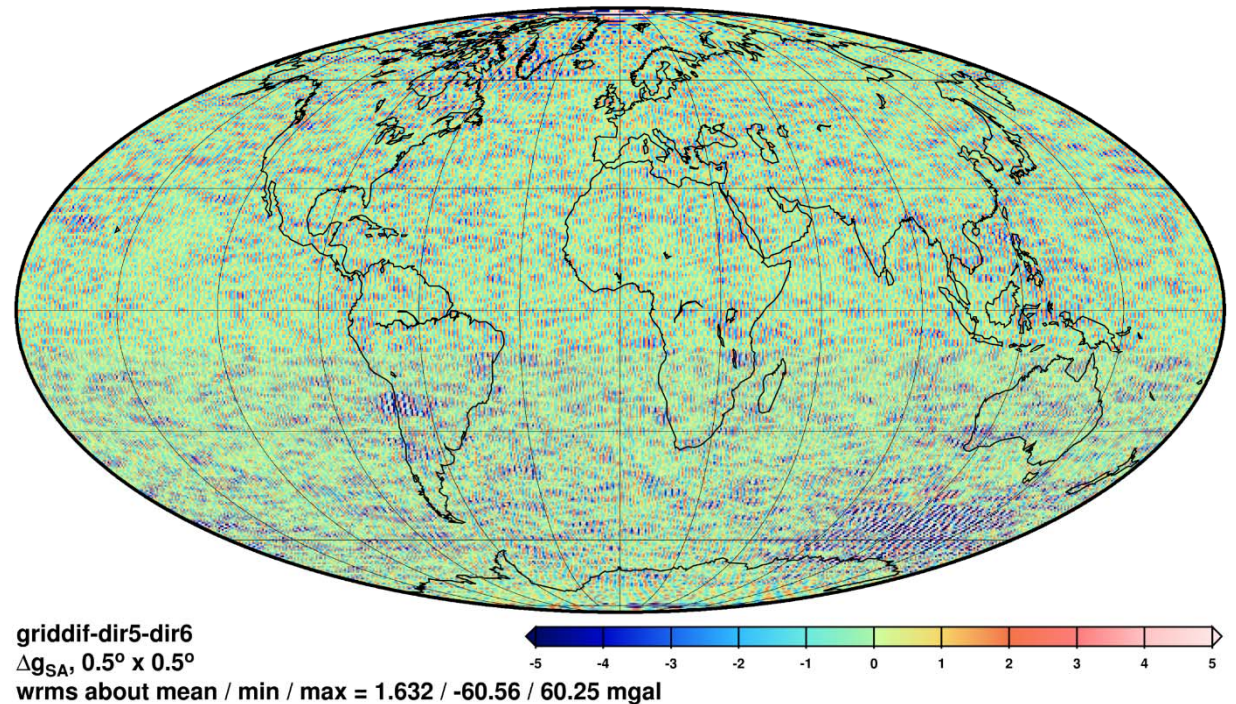
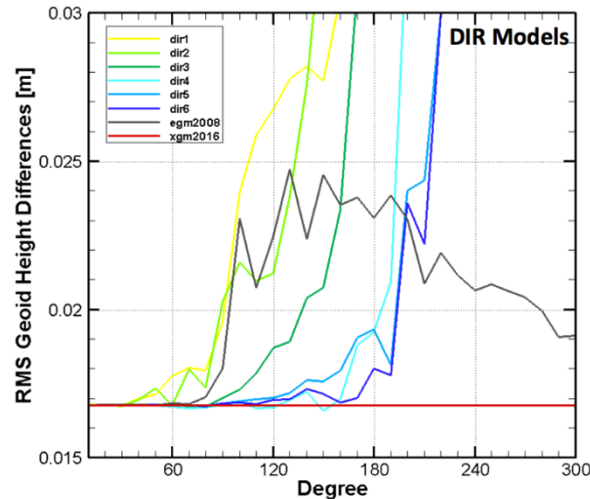
Data	Std	Percent improvement Wrt Jason1 GM gravity
Jason-1 GM (1 year)	2.76	0 %
Jason-2 (1 st LRO)	2.77	~-1 %
Jason-2 (2 nd LRO)	2.78	~-1 %
Jason-2 (all)	2.68	4%
C2 only (8 years)	2.66	5%
SA only (3 years)	2.67	4%
Combinations:		
C2+SA+J1	2.58	7%
C2+SA+J2	2.57	7%



Jason-2 is the ONLY Geodetic mission which can decrease the track distance below 8 km (past GM's) in a systematic way to 4 km after 2 years and 2 km after 4 years. Hence it will enable mapping of finer and finer scale in the gravity field not mapped before and likely enable us map bathymetry with finer scale than ever before.

Bruinsma et al. ESA's new satellite-only gravity field model via the direct approach (DIR-R6)

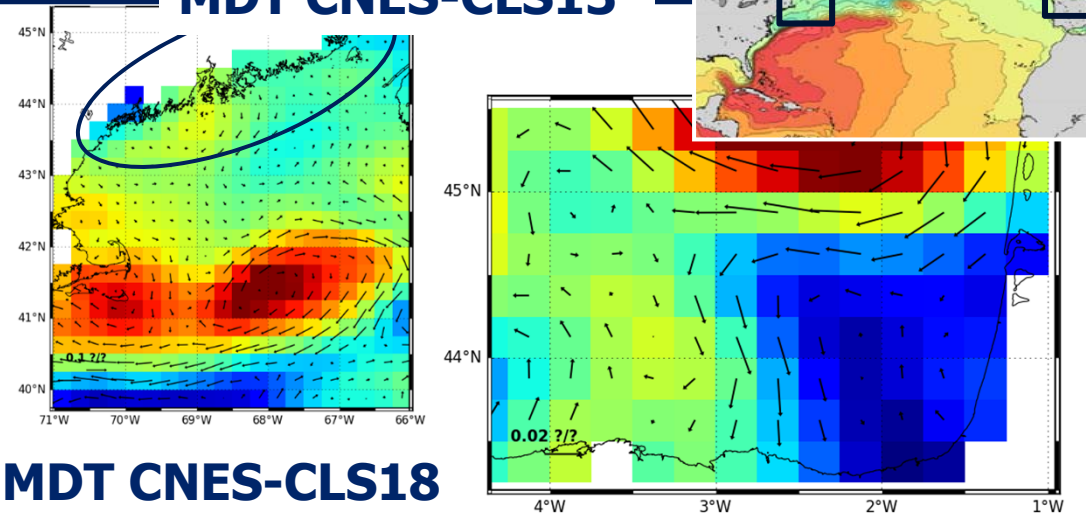
GOCE-DIR-R6 is available and significantly more accurate than previous GOCE model releases.



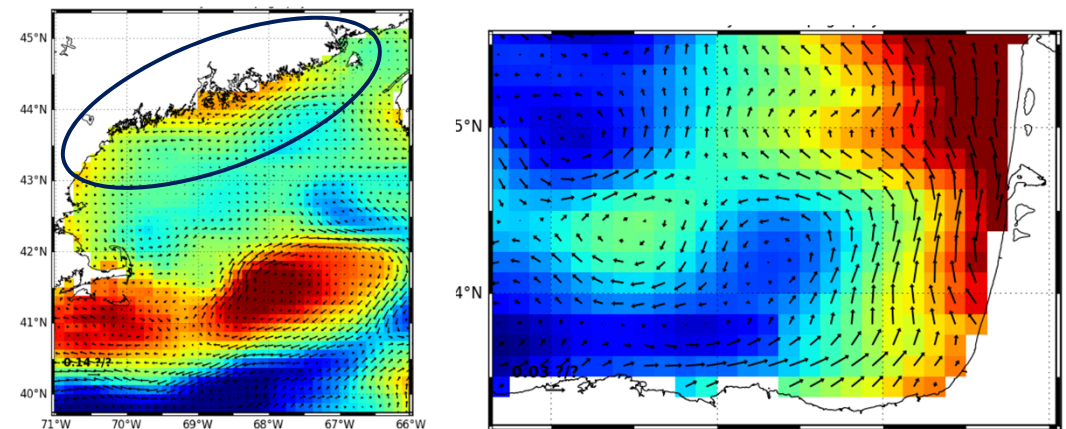
Mulet et al. New CNES-CLS18

- Most significant in coastal areas and in strong western boundary currents
- Validation/feedbacks done also by beta users: Thanks a lot to all of them to their valuable feedbacks !!
- **Further improvements needed: At short scales, At high latitudes, In coastal areas**

MDT CNES-CLS13



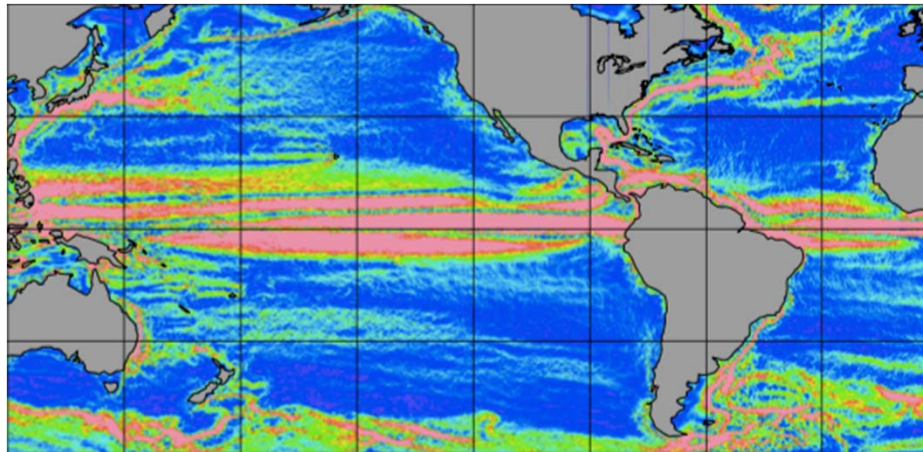
MDT CNES-CLS18



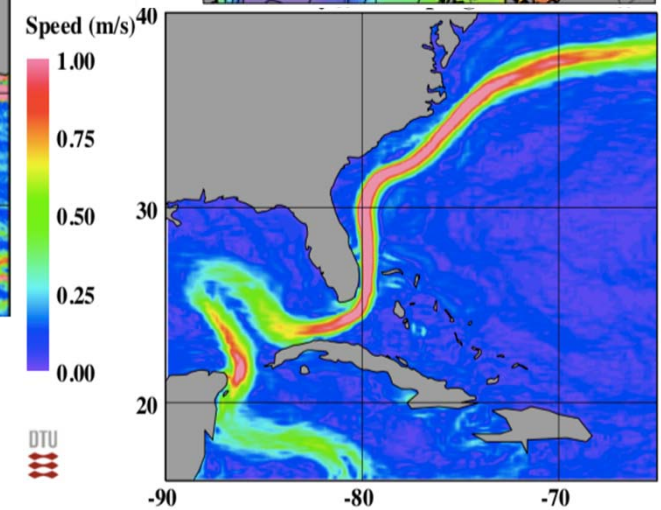
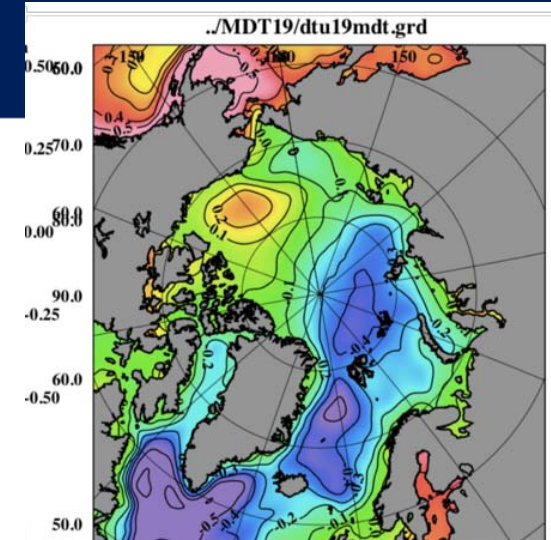
Knudsen et al. The new MDT - DTUHH19MDT

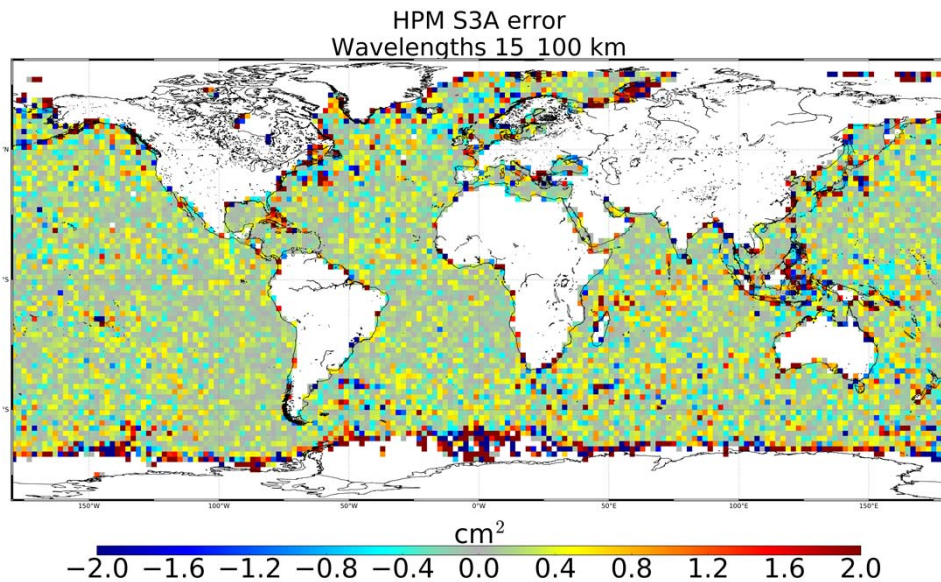
New MDT integrating altimetry with drifters

Speed (m/s)



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- Good performances of recent MSS models tested at short wavelengths ([100, 15km])
 - Significant reduction of the omission errors vs CNES_CLS_2015 model
 - Residual commission errors observed on DTU_2018
- Hybrid Mean Profiles defined along uncharted tracks still remain more performant than the grid MSS models
 - ➔ Sentinel-3A HMP implemented in operation L3 processing since April 2019
- **Important to reduce the MSSs error in order to access to the small scale signal with SWOT during the first months of the mission**

Discussion questions

Jason-2 issues

Interest in reprocessing the last part of the 2nd LRO not available in GDR?

Jason-3 issues

- **Should Jason-3 be placed in an interleaved orbit (like Jason-2)? Or should Jason-3 go directly into a geodetic phase? Likely End 2021.**
- What end-of-life orbits should be considered for after the interleaved phase?
- Reconstitute an EoL group to study possibilities?

Other

- Value of extending the reference period to 30 years?
- MDT issues – MSS-> MDT errors.
- Data for validation (Independent satellite)
- MSS with/without DAC(IB)

Other from organizers

- How should we advance coastal, hydrology, cryosphere, and ocean altimetry?
- Should the OSTST try a joint meeting with other teams (Argo, SWOT, etc.)? If so, what other groups?
- Are there suggestions about how lower the carbon footprint of the meeting?

Recommendations

- Reconstitute the Jason EoL group to initiate the study of possible moving J-3 into a “controlled” geodetic orbit after the Jason-CS/S6 commission phase and to maximize the benefit to both oceanography and geodesy (mean sea surface).
- Study possibilities to use and continue the Jason-2 LRO to gain 2 km across-track spacing.
- Acknowledging that by 2021 there will be at least 3 operating ERM missions, recommend to study the value of putting Jason-3 in an interleaved mission vs geodetic mission for operational usage and for oceanographic purposes.