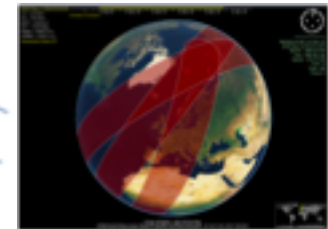
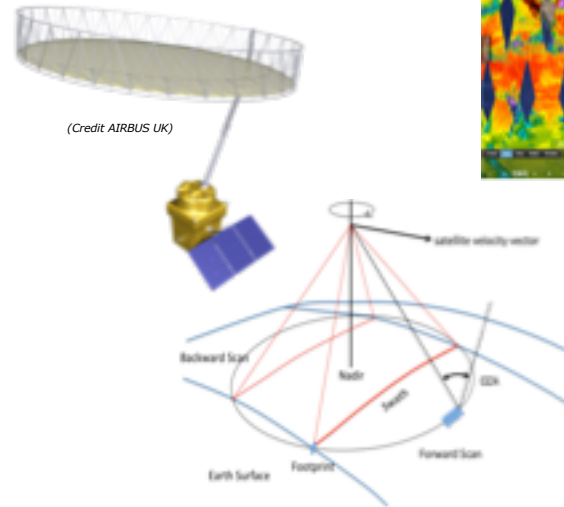
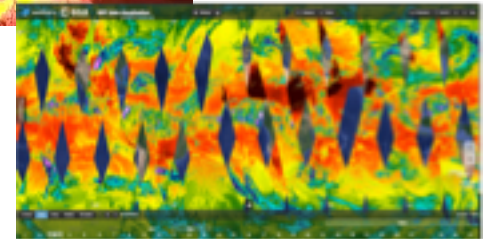
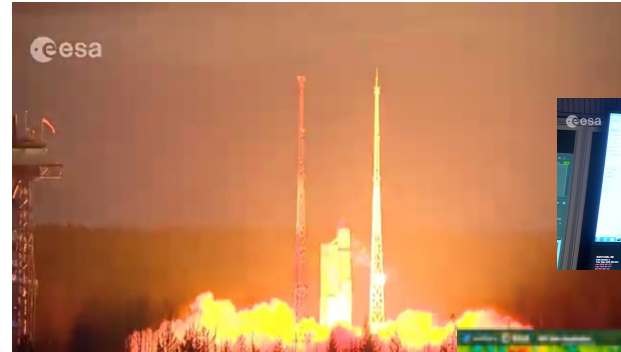


ESA Report To GHRSSST 19

C Donlon, ESA/ESTEC, Noordwijk, the Netherlands

Outline

- S3B Launch
- S3C&D status
- FRM4STS – FRM for SST
- SST validation using IR radiometers
- Ocean Virtual Laboratory and S3VIEW
- GHRSSST XX preparations Rome with CNR
- Phase A/B1 for 30-50m TIR mission
- Phase A/B1 for Wide Swath Microwave Radiometer mission



S3B Launch

- Launch campaign very intense
- Launch and injection without problems.
Launch was very specific to cater for subsequent activities to bring S3B into a tandem flight with S3A
- LEOP completed in record time (16 hours to completion!)
- Current activities are normal work to exercise all of the instruments and prepare for operations later this year.
- SLSTR in good shape – cooldown last week and initial results look great!



- A quick recall of C/D models contract specificities
 - a. S3C/S3D as identical as possible to S3A/S3B in order to replace the A/B models by the end of their life:**
 - Same orbit and ground tracks as A/B
 - Same interfaces with the Ground segment (FOS & PDGS) –as far as possible
 - b. The Sentinel-3C/D Baseline is identical to Sentinel-3A/B with the following main changes:**
 - Upgrade of the GNSS Receiver for operation with Galileo signals in addition to all GPS signals (including the post-2020 ones)
 - The procurement of DORIS is part of the industrial development (was in-kind contribution from France on Sentinel-3 A/B)
 - Feasibility of Moon Calibration for optical payload to be assessed
 - Applicability of latest ECSS “C series” to new equipment and to modified elements
 - c. The actual performance of the following activities to finalise Sent-3D will need to be covered by a follow-on contract:**
 - SLSTR calibration,
 - SLSTR and OLCI integration on platform;
 - S/C environmental test and remaining integrated test activities until FAR
 - d. Final launcher selection and Phase E1 activities also not included in current contract**
 - Current launcher requirements identical to S3A/S3B contract: compatibility with Rockot and VEGA environment
 - Rockot and (probably) VEGA to be discontinued by time of S3C/S3D launch: compatibility with final launcher (likely VEGA-C) will need to be assessed at a later stage

Sentinel 3 Mission Status: Sentinel-3C/-3D



- **Sentinel-3C&D Satellite production Review completed 14th Feb'17, authorising the Phase D activities**
- **Reviews since SPR completion:**
 - a. Central Software CDR review end of September '17
 - b. Functional Chain Verification (FCV) TRR end of November '17
 - **Completion of activities expected in the Sept-Oct. 2018 timeframe**
- **Start of the S3C S/L mechanical integration of the units on the platform structure is planned beginning July**
 - a. S3C structure manufacturing completed and delivered in Oct'17 to TAS-I
 - b. S3C Propulsion Platform fully integrated (with dummy thrusters) and (proof) tested
 - c. Integration readiness Review (IRR-1) mid-June
- **Storage and maintenance plan still under consolidation between TAS-F and the various subco's**
- **Approach for launch of C and D models under consolidation as part of the Long Term Scenario (LTS)**
 - d. Latest proposal is to have C launched in 2022 timeframe to increase S3 constellation to three satellites
 - e. D model kept as replacement model (launch ~2025)
 - f. Implementation of (which) tandem phase on C and/or D to be discussed at a later stage



Sentinel 3 Mission Status: Sentinel-3 Next Generation



- Sentinel-3 Mission continuation after the C & D models covered under the CSC Extension
- **Various concepts under evaluation**
 - a. Separation of the Optical mission from the Topographic mission seems agreed at all levels
 - **Allows removing constraints placed by each mission on the other**
 - b. The optical mission will be carrying the next generation of SLSTR and OLCI
 - Since revisit time is arguably the most critical parameter that users request to improve for these observations, wider swath performances are foreseen as the necessary technological improvement, although other parameters could also be targeted
 - Two Sentinel-3 Opt S/L's will be required to provide the continuity to the optical mission
 - c. The sun-synchronous orbit continuity after Sentinel-3C and D has to be guaranteed by a continuation of the topographic component of Sentinel-3
 - Having a dedicated topographic component will allow selecting an optimal orbit for the sun-synchronous topographic component
 - Two wide-swath altimetry S/L's will be required to provided the continuity
- **The above concepts are reflected in the latest CSC Long Term Scenario presented to PBE0**
 - a. Scenario still under consolidation, final only at C-MIN 2019!
 - b. Final scenario likely to be influence by available ESA/EC budget for coming decade





Left:

ESR (right)



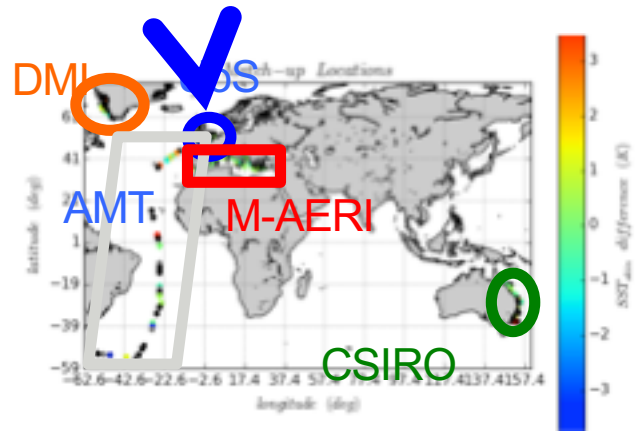
European Space Agency

S3 SLSTR validation using ship borne TIR radiometers

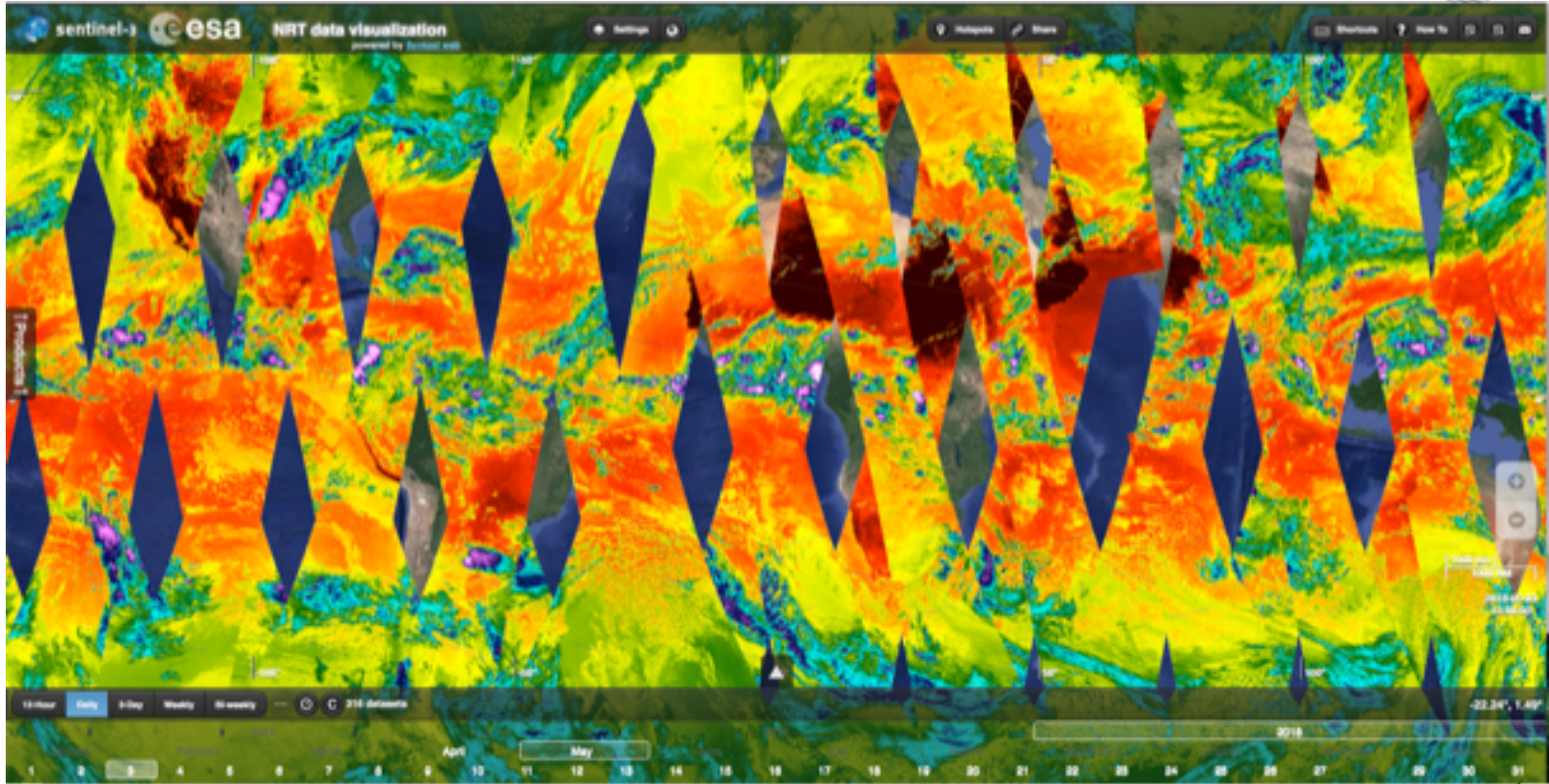
- Project to ensure that FRM TIR ship borne radiometers are used to collect validation data
- Critical time as we are entering the S3 Tandem phase
- Implemented using FRM procedures and protocols
- KO April 2018 with a duration of 24 months
- See Fred Wimmer Presentation on Wednesday



<http://www.ships4sst.org>



ESA S3-VIEW Service



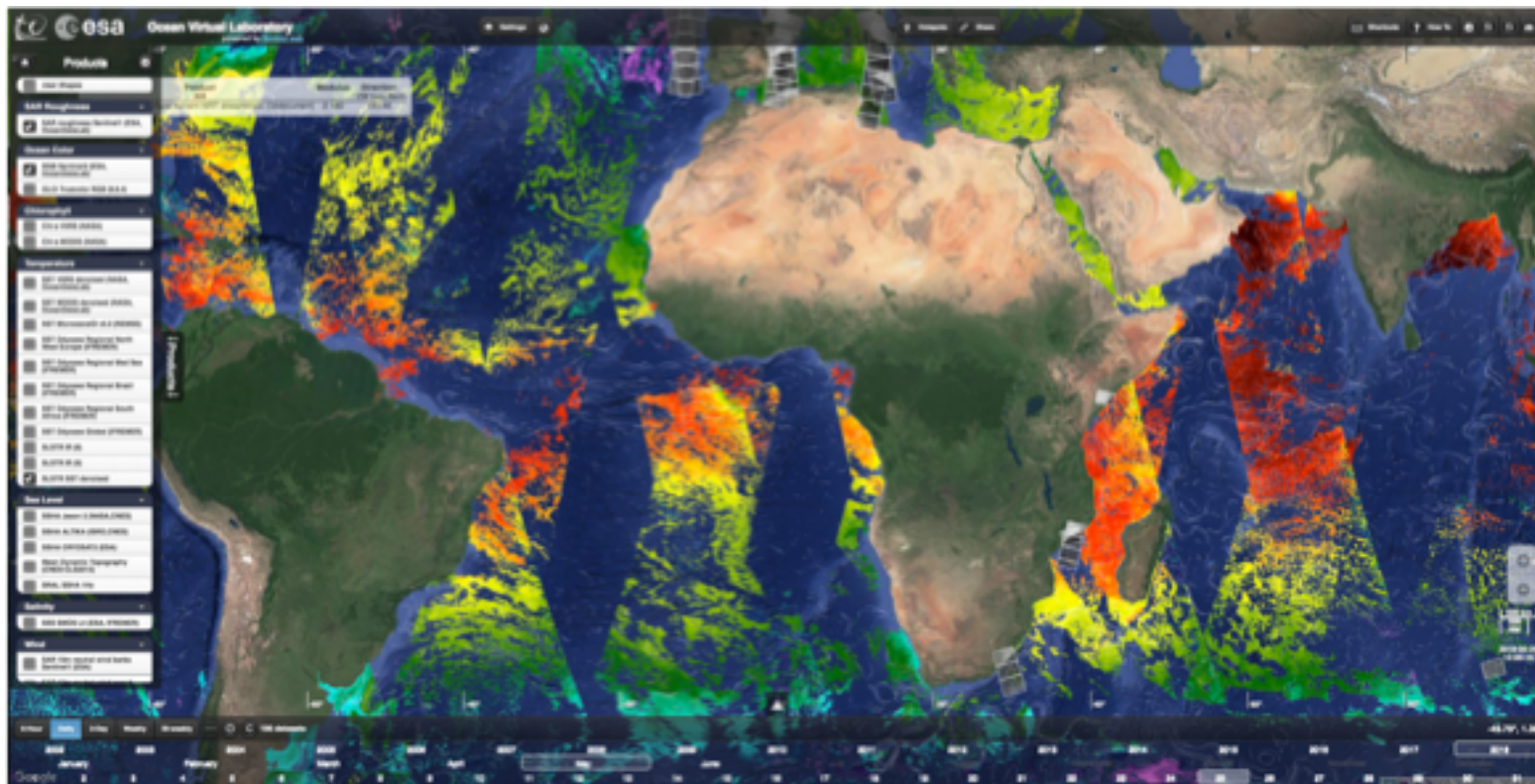
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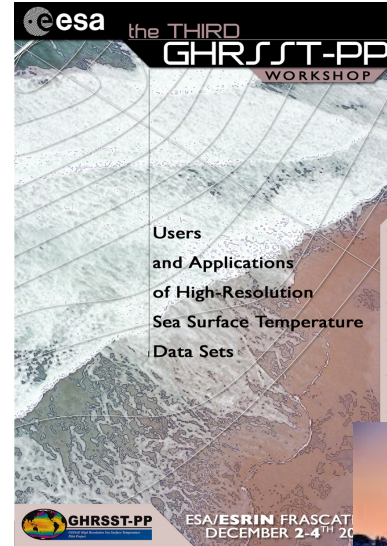
European Space Agency

ESA Ocean Virtual Laboratory



GHRSSST XX Preparations

- The last GHRSSST meeting in Italy was in 2002 GHRSSST-III. Doug May banged his fist and the rest is history!
- GHRSSST-XX will be organized at ESA/ESRIN with CNR
- The idea is to have a forward looking meeting focusing on future innovation and challenges rather than a retrospective self-congratulatory meeting.
- ESA Phi-Lab will be active and it will be an exciting meeting: New Sensors, new approaches (eg. HAPS) and where we want GHRSSST to be in 2030



Phase A/B1 for 30-50m TIR mission



- **A dedicated mission within Copernicus evolution:**
To complement Sentinel observation capabilities with high spatio-temporal resolution Thermal Infrared observations over land and coastal regions in support of agriculture management services, and possibly a range of additional services
- **Primary objective:** to support monitoring evapotranspiration (ET) rate at European field scale by capturing the variability of Land Surface Temperature (LST) (and hence ET) enabling more robust estimates of field-scale water productivity
- **Secondary objective:** to support mapping and monitoring the soil composition (mineralogy and organic matter) and its dynamics through emissivity estimates.
- **Complementary objective:** to support a range of additional services benefitting from TIR observations (e.g. coastal zone management, High-Temperature Events (HTE), urban heat islands).
- **Spatial Resolution: 30-150 m**
- **Coverage:** The LSTM mission shall provide systematic observations over land and inland water areas located between -56° latitude and $+83^{\circ}$ latitude, including major islands (i.e. islands with a surface greater than 100 km^2), and coastal waters within 100 km (threshold) from the shoreline areas – **goal: extended economic offshore zone (200 nautical miles).**
- **Revisit:** 1-3 days
- **Channel(Bandwidth):** 8.6 (~ 0.2), 8.9(~ 0.2), 9.2(~ 0.2), 10.9(0.4) and 12(0.47) μm
- **NEdT:** $\leq 0.5 \text{ K}$



