



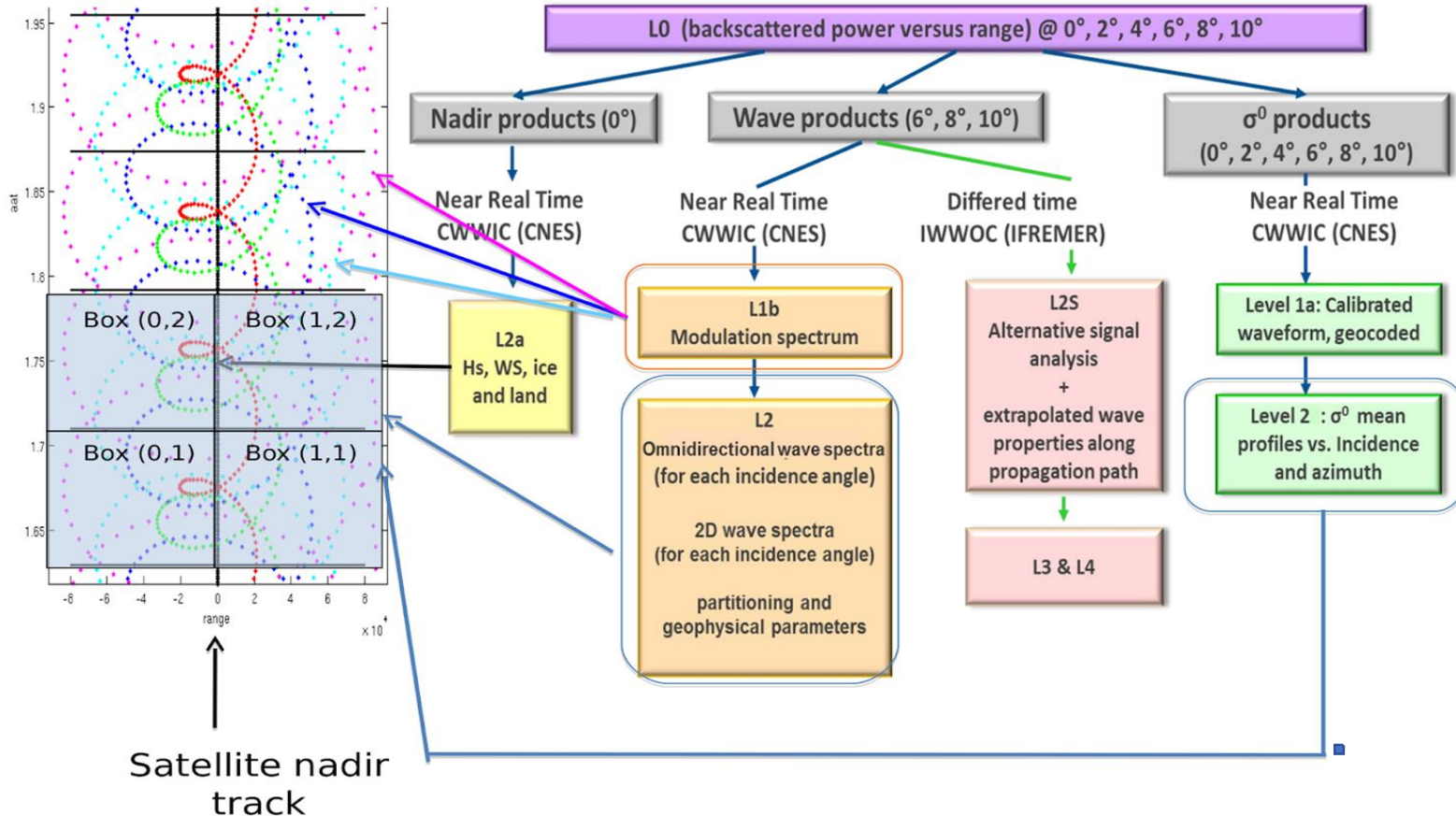
# Demo Products promoting SWIM Calval Team upstream work



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# L0-L2 products: exhaustive for experts studies

## Data products



L2 products contain:

- ❑ 159 fields
- ❑ More than 40 flags
- ❑ 12 types of spectrum:
  - › 2D slope and modulation spectrum
  - › 1D omnidirectional slope spectrum integrated over all azimuth
  - › All of them declined for beam 6, 8, 10, and combined
- ❑ 9 types of wave estimation
  - › 5 for nadir (1hz,nsec,native,nbox,models)
  - › 12 for off nadir (each beam+combined x3 partitions,models)

# L2P: Simplified products

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## L2P products contain:

- Less than 12 fields
- 1 or 2 flags
- 1 type of spectrum
- 1 types of nadir Hs
- 4 types of wave estimation
  - › 1 for total spectrum
  - › 3 for the partitions

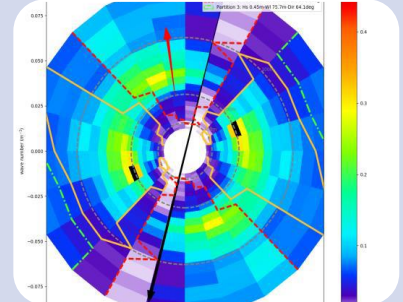
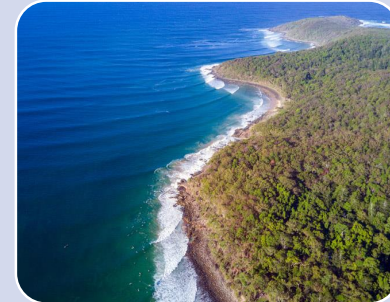
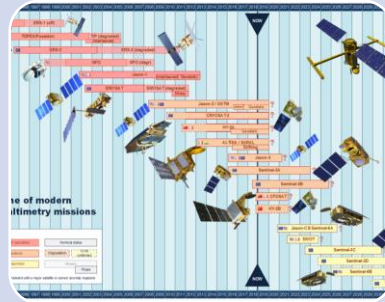


# L2P: simplified products for application studies



Calval group works at qualification of the mission with these products in order to find out :

The best usefull fields adapted for different application users, at a given step of the calval studies.



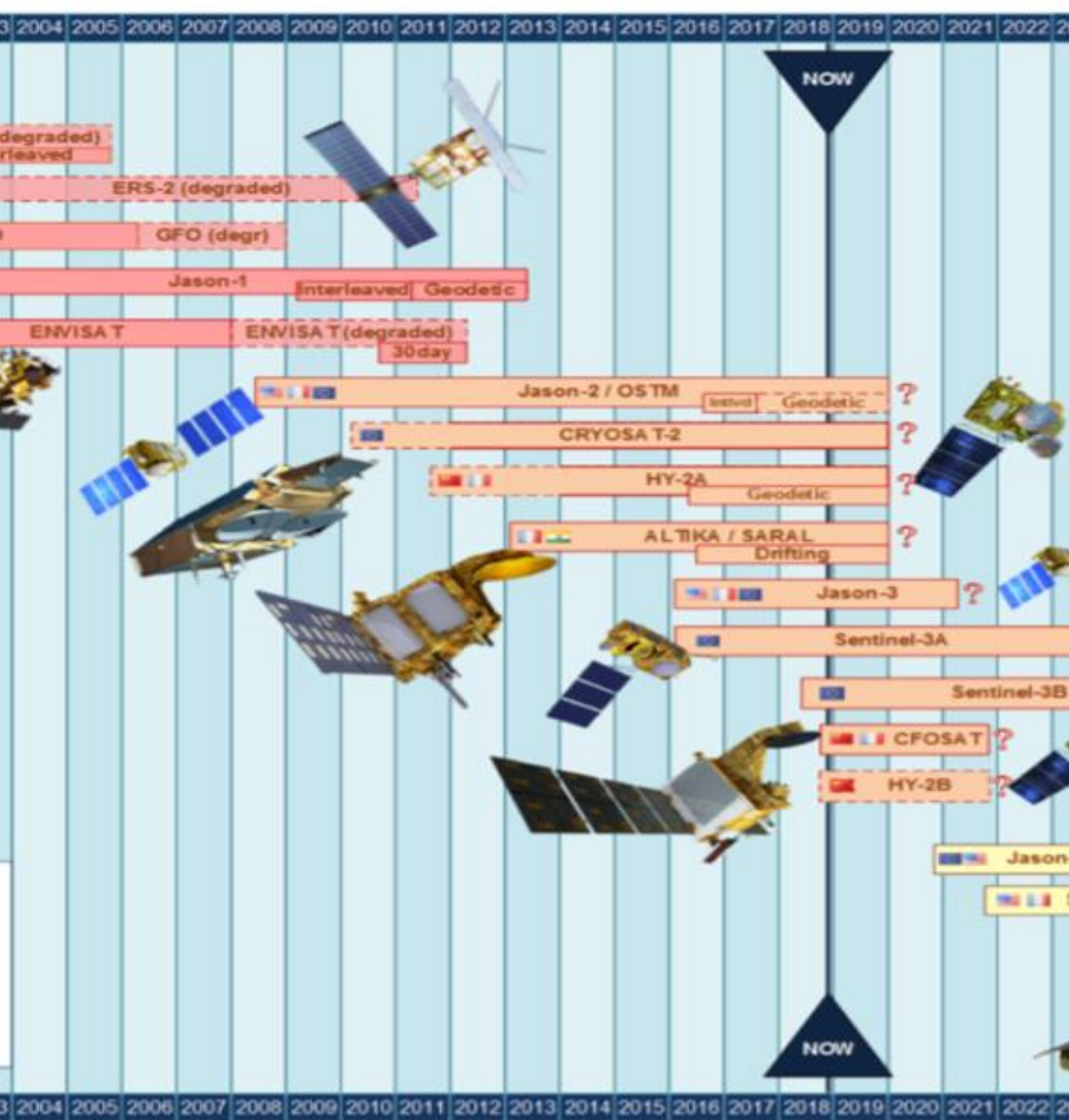
Nadir 1Hz  
for L3  
computation

Nadir  
Climate  
oriented

Nadir 5Hz  
for coastal  
applications

Off nadir  
simplified





Nadir 1Hz for L3 computation

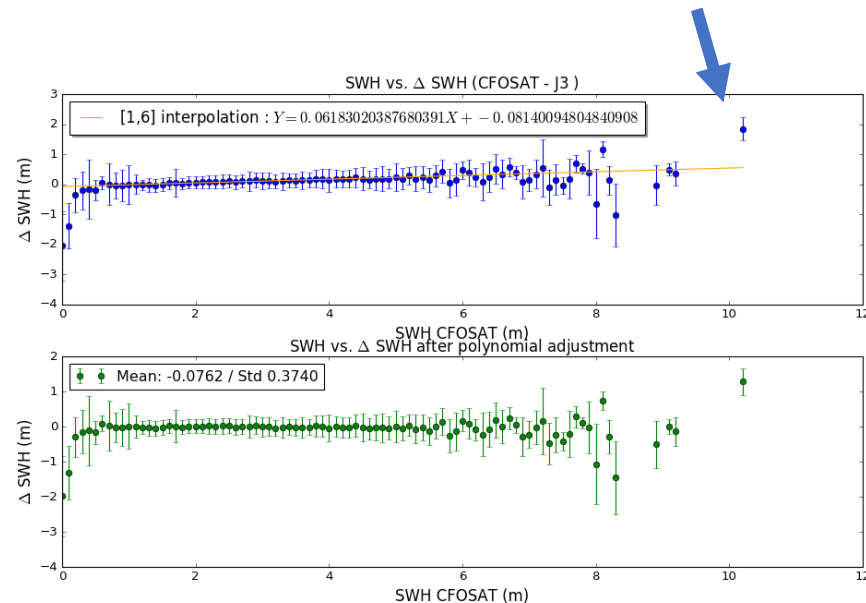
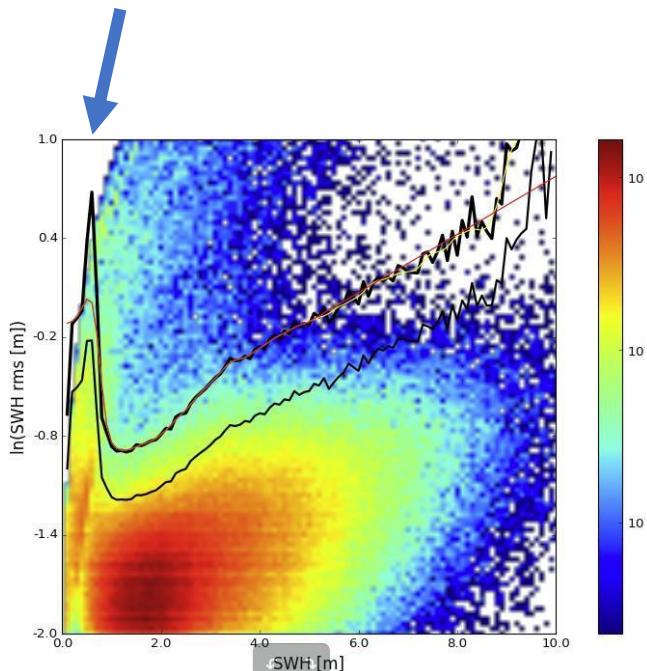
# L2P: simplified products for application studies



- ✓ Easy comparison to other nadir missions:
- ✓ Provided in near real time (3h) and with a 1Hz sampling
- ✓ Based on a selection of valid data from quality criteria (based on Queffelec 2018), and bias alignment to buoys networks (based on crossover bias reduction).

## L2P products contain:

- Less than 12 fields
- A validation flag
- 1Hz nadir SWH data
- 1Hz nadir sig0 derived wind
- The abacus to fit to J3 mission
- The abacus to fit to the buoys



# L2P/ L3 1Hz nadir product like the others...



Level-2



Level-2P



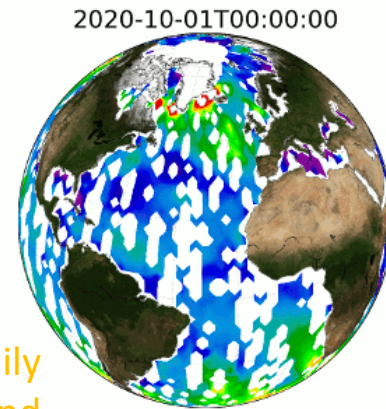
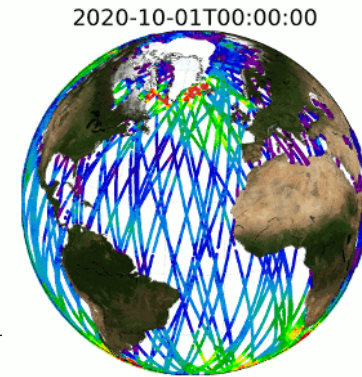
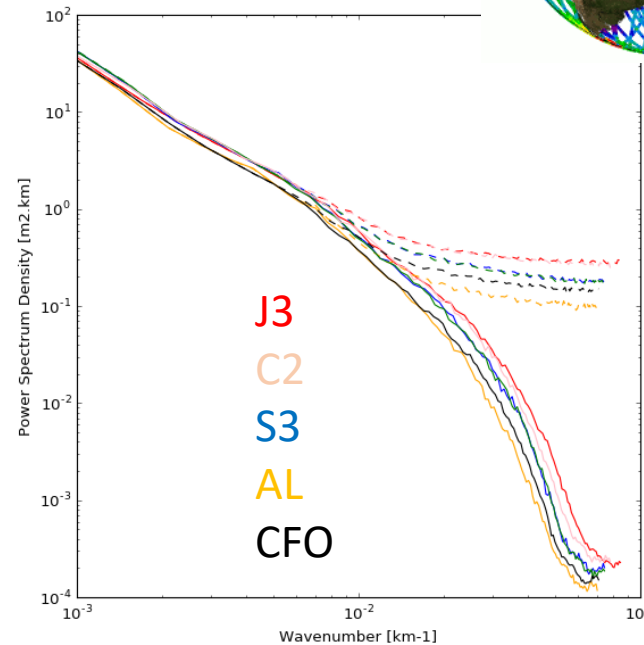
Level-3



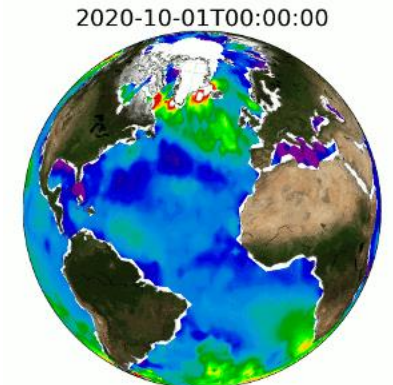
Level-4

✓ Since July 2019

- ✓ Nadir 1Hz L2P/L3 are delivered to CMEMS similarly to other nadir missions AltiKa, Jason3, HY2B, S3...
- ✓ The high frequency and noise is reduced thanks to the Quilfen et al. EMD method.



Daily and Instantaneous gridded fields





# Nadir 1Hz for climat applications



# L2P: simplified products for application studies



✓ Planned for July 2021

✓ For climate studies:

✓ Will be fitted to the CCI Sea State time series with abacus at crossovers

✓ Reprocessed data set from 2021 Feb:

✓ L2 dataset begins in April 2019 when the off nadir spectrum became reliable

✓ L2P nadir will begin in November 2018 (6 months more)

✓ Updated wind solution improved compared to the previous one:

✓ Inversion model inverted over 1year of data instead of 3months

L2P products contain:

Less than 12 fields

A validation flag

1Hz nadir SWH data

1Hz nadir sig0 derived wind

The abacus to fit to CCI dataset



**sea state**

cci



# Nadir 5Hz for coastal applications

# L2P: simplified products for application studies



✓ Planned for July 2021

✓ For high frequency and coastal studies studies:

✓ To take advantage of the very small noise on nadir data (see Tourain et al. 2021 as well as Piras talk)

✓ A dedicated validation flag will be derived with a close look at:

✓ Coastal areas

✓ High variability areas

✓ This dataset will be proposed to compute L3 demonstration product for CMEMS internal users

✓ It could improve potential future coastal HF modeling (see Dalphinnet talk)

L2P products contain:

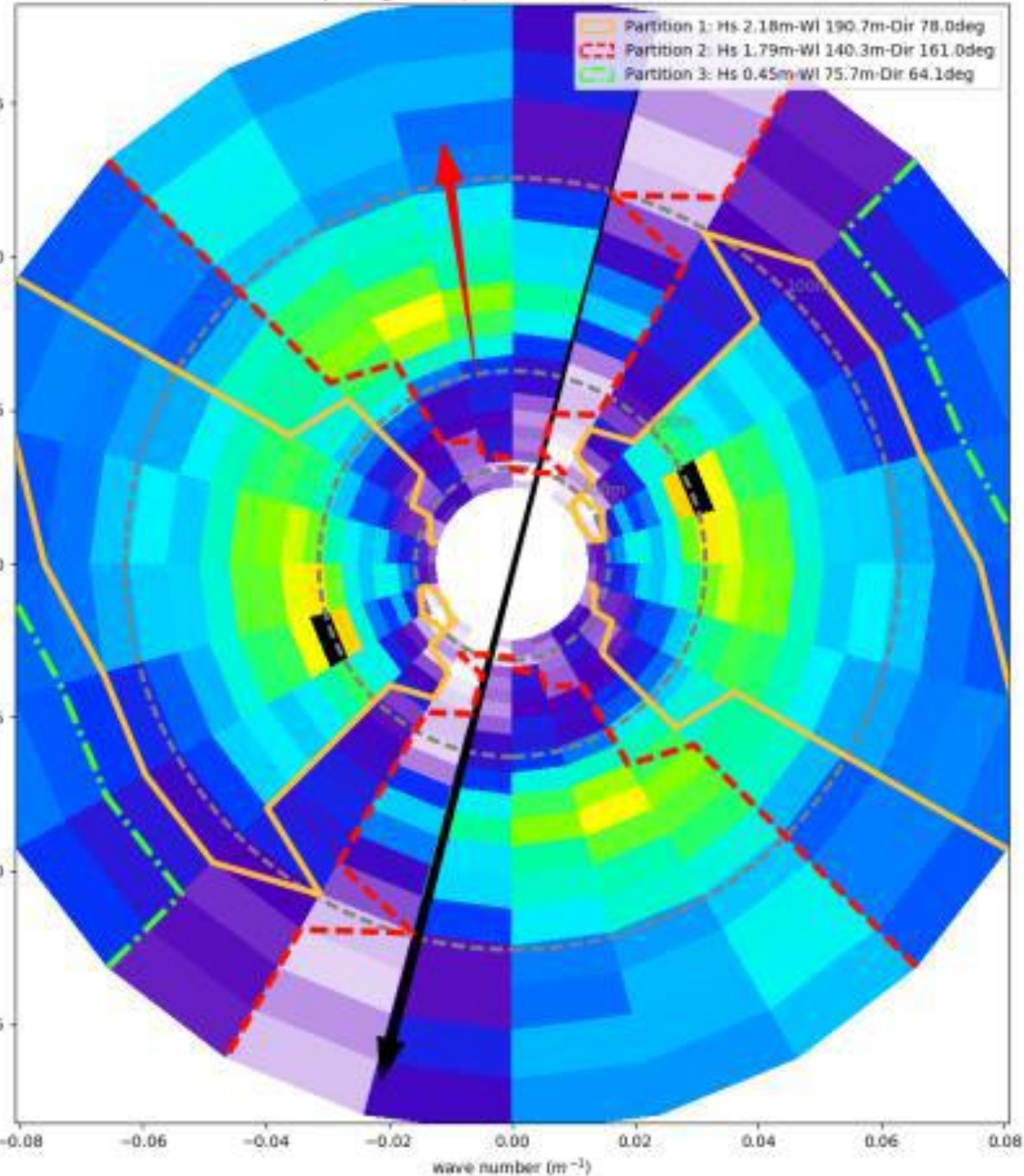
Less than 12 fields

A validation flag

5Hz nadir SWH data

5Hz nadir sig0 derived wind

CFOSAT 2D mean slope spectrum  
box : 217 - posneg : 0 - repartitioned beam 10 - U10: 7.97 m/s



**OFF-Nadir  
simplified  
products**

# L2P: OFF-Nadir simplified products



✓ V0 Planned for March 2021

✓ For user friendly look at off nadir:

✓ SWIM 2D Spectrum

✓ The associated wave parameters: (Hs, Direction, Wavelength)

✓ A dedicated validation flag to be confident in :

✓ The spectrum

✓ The partitions

✓ This version is a sub ensemble of the L2 dataset.

✓ Based on calval studies (See Hauser, Aouf, Peureux... talks) the chosen spectrum is the Beam10 which shows better behaviors.

L2P products contain:

Less than 12 fields

1 Valid spectrum flags

1 valid partition flag

1 type of spectrum

1 types of nadir Hs (nbox)

4 types of wave estimation

› 1 for total spectrum

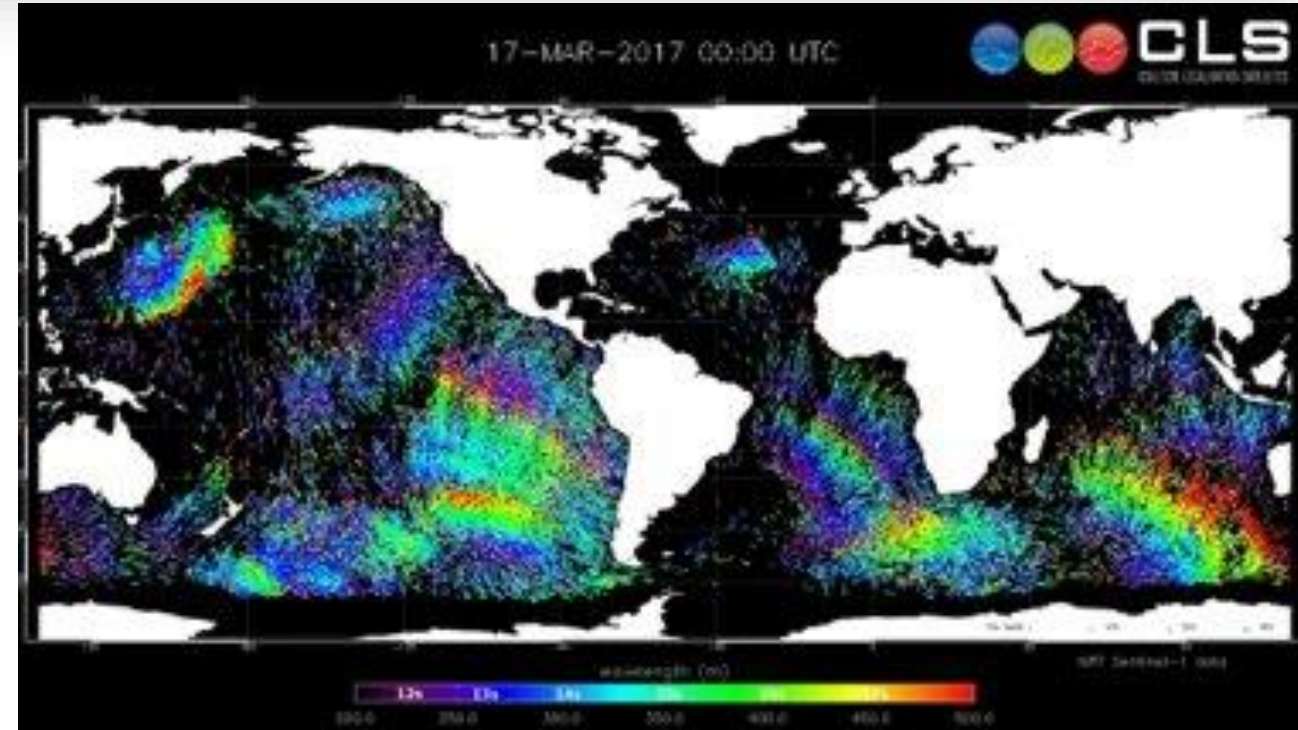
› 3 for the partitions

1 type of nadir Wind (nbox)

## L2P: OFF-Nadir simplified products



- ✓ These dataset will be proposed to compute L3 demonstration product for CMEMS internal users (fireworks)
- ✓ Depending on calval studies and users returns, it could be improved until its introduction in the official catalogue in November 2021



- ✓ Several improvements are under analysis and could be added to the product in particular, an improved new partitioning method
- ✓ These data will be compliant with Sentinel-1 products available on CMEMS
- ✓ The validation and comparisons to this mission are on going

# L2P: OFF-Nadir simplified products

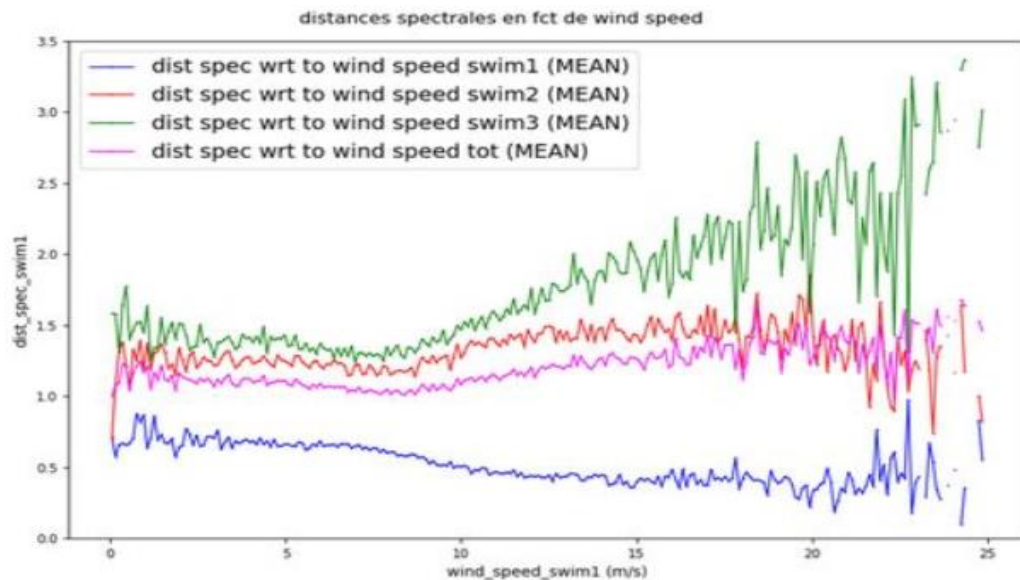


✓ Planned for May 2021

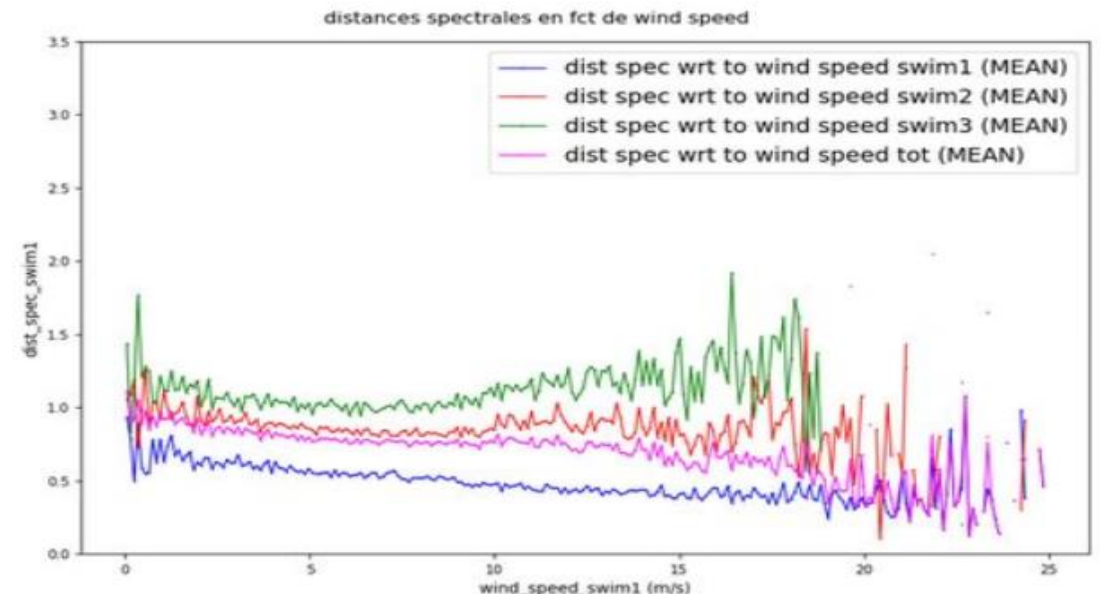
✓ The validation has started and demonstrate the quality of such partitions

✓ After cross-assignment, based on a minimisation of the spectral distance the results are promising to be more consistent with WAM model

Blue -> partition swim 1 ; Red -> partition swim 2 ; Green -> partition swim 3



L2 Data



L2P Data

# Distribution expected calendar



Off nadir products.

February 2021:  
V0 L2P Off  
nadir

May 2021: V1  
Off nadir with  
new partitions

November  
2021: V1  
With future  
improvements

Nadir products.

July 2019:  
V0 1Hz  
nadir L2P

February  
2021: V0  
1Hz climat  
reprocessed  
time series  
from April  
2019

July 2021:  
V1 1Hz  
Climate  
longer time  
series from  
Nov 2018  
with CCI  
compliance

November  
2021: V0  
5Hz Coastal  
nadir L2P





## CFOSAT L2P products: Have a try!

CFOSAT

- ✓ Offering the CalVal Team progress to the largest community
- ✓ Best current solutions elected by the calval team,
- ✓ Best data selection, thanks to a « all in one » quality flag
- ✓ Application oriented
- ✓ Homogeneous to other missions:
  - ✓ Nadir constellation Hs and wind
  - ✓ Off nadir Sentinel One / Wave Models compliant
- ✓ User friendly:
  - ✓ We answer your questions and claims via Aviso web site



<https://www.aviso.altimetry.fr/fr/missions/missions-en-cours/cfosat/acces-aux-donnees.html>

WHAT DO

YOU  
NEED



Feel free to ask or  
comment about the  
products contains  
and your own needs