Jason-2 waveforms, tracking and retracking analysis

P.Thibaut, J.C.Poisson, A.Ollivier, S.Philipps, M.Ablain

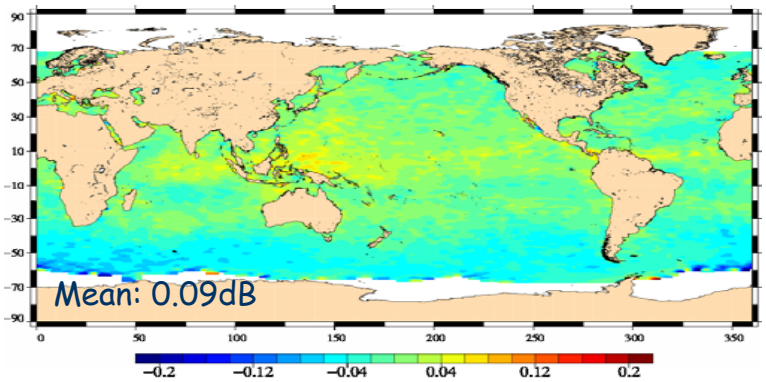
CLS

Nice, France
November 2008

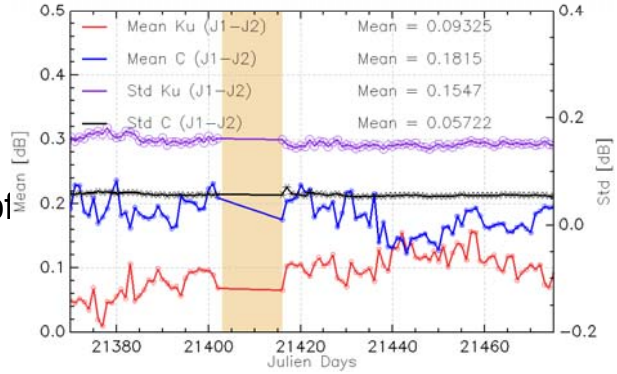
cnes
CENTRE NATIONAL D'ÉTUDES SPATIALES

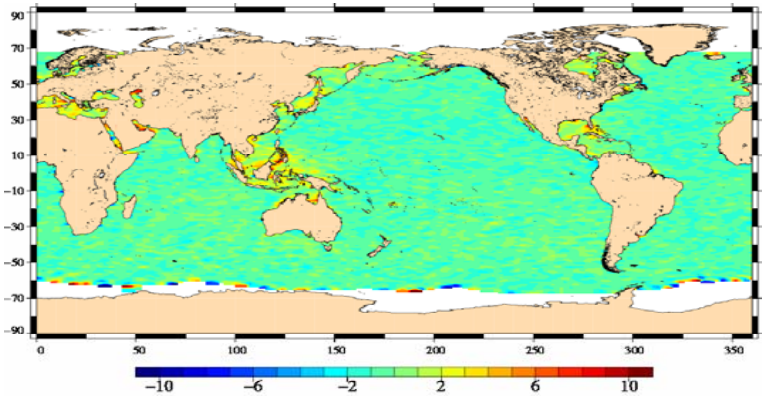
CLS
COLLECTE LOCALISATION SATELLITES

Jason-2 performances wrt to Jason-1

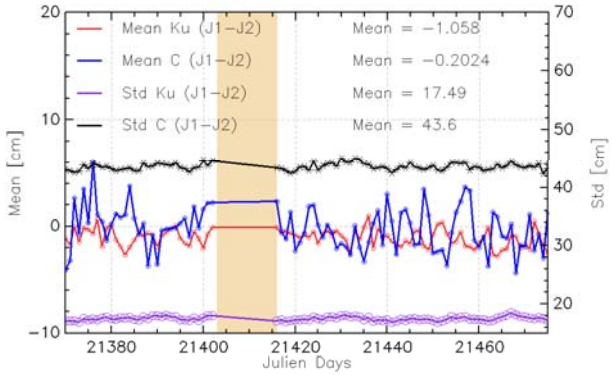


Map of JA1-JA2 Ku-band Sigma0 differences (mean over cycles 0 to 10) Daily monitoring of mean and std of JA1 – JA2 Sig0 difference





Map of JA1-JA2 Ku-band SWH differences (mean over cycles 0 to 10). Daily monitoring of mean and std of JA1 – JA2 SWH difference



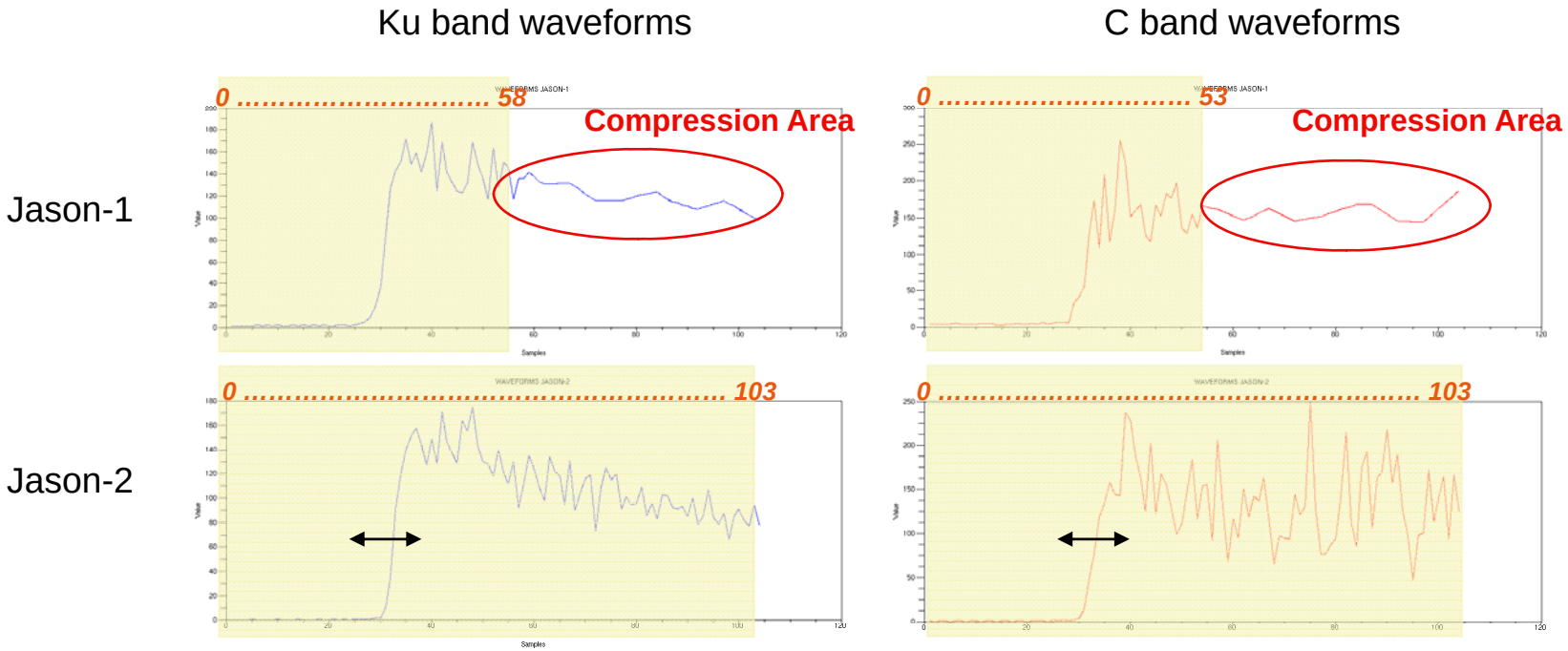
➔ **Very good agreement between J1 and J2 over ocean**

➔ **For Jason-2, results not impacted by tracking modes**

➔ **See CLS/Calval talk and CLS/Calval posters**

Differences between Jason-1 and Jason-2 waveforms

➔ Due to telemetry rate, Jason-1 waveforms are compressed

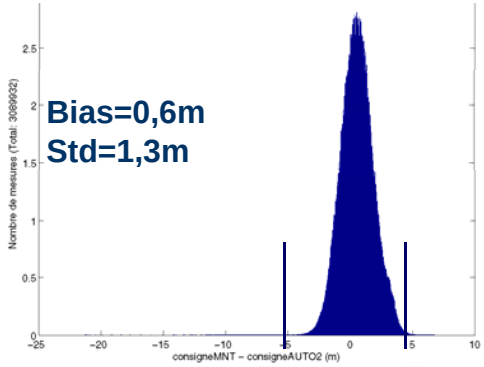


➔ SGT tracker on Jason-1 = echos are centred on gate 44

➔ Median and DIODE/DEM on Jason-2 = Lateral motion of the echos in the window

- for median : depends on the waveheight (as for Envisat)
- for DIODE : depends on the local value of the DEM
- AGC tracking loop : small differences in C band loop coefs

Differences between median and DDEM trackers

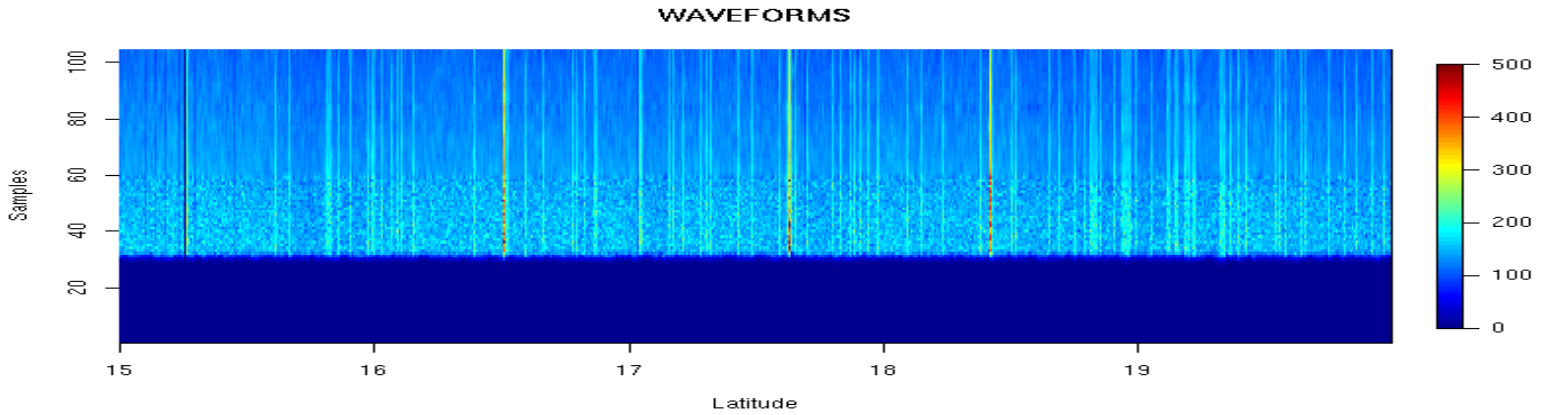


Waveforms in deep ocean

Jason-1

SGT

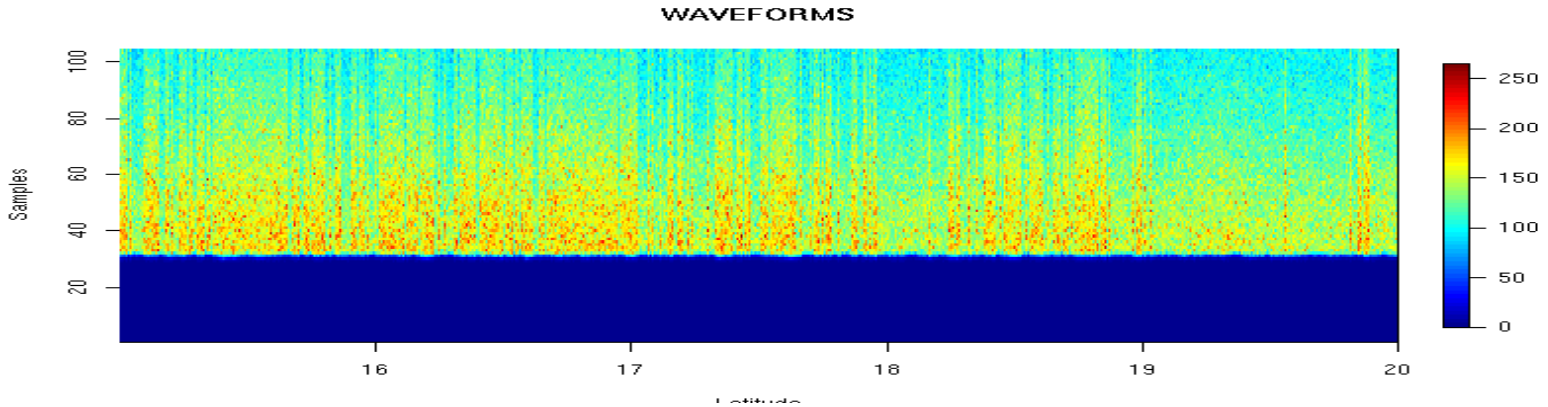
Cycle 240



Jason-2

Median

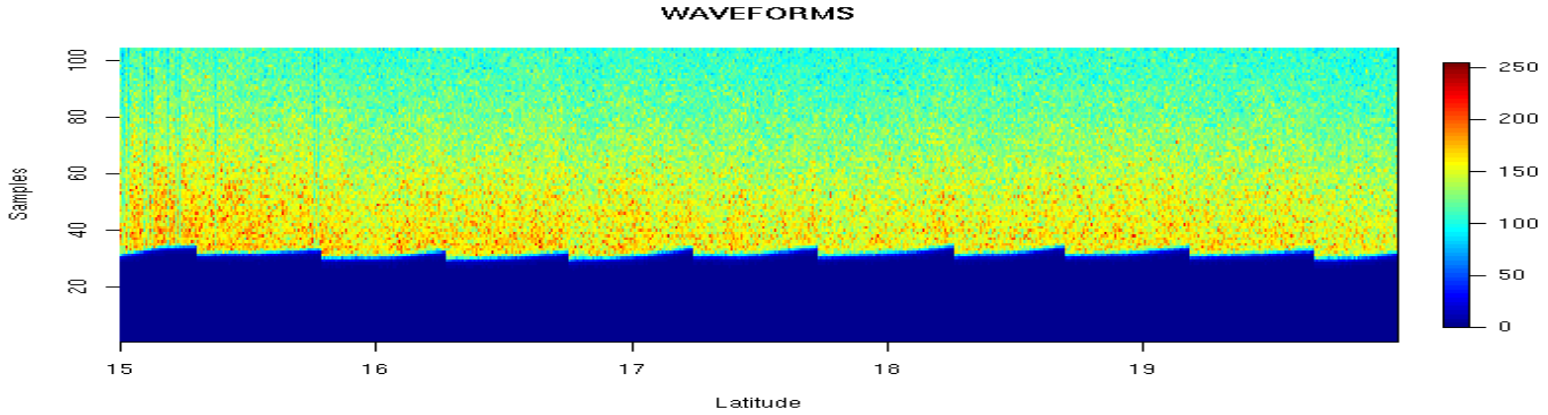
Cycle 008



Jason-2

Diode/DEM

Cycle 007

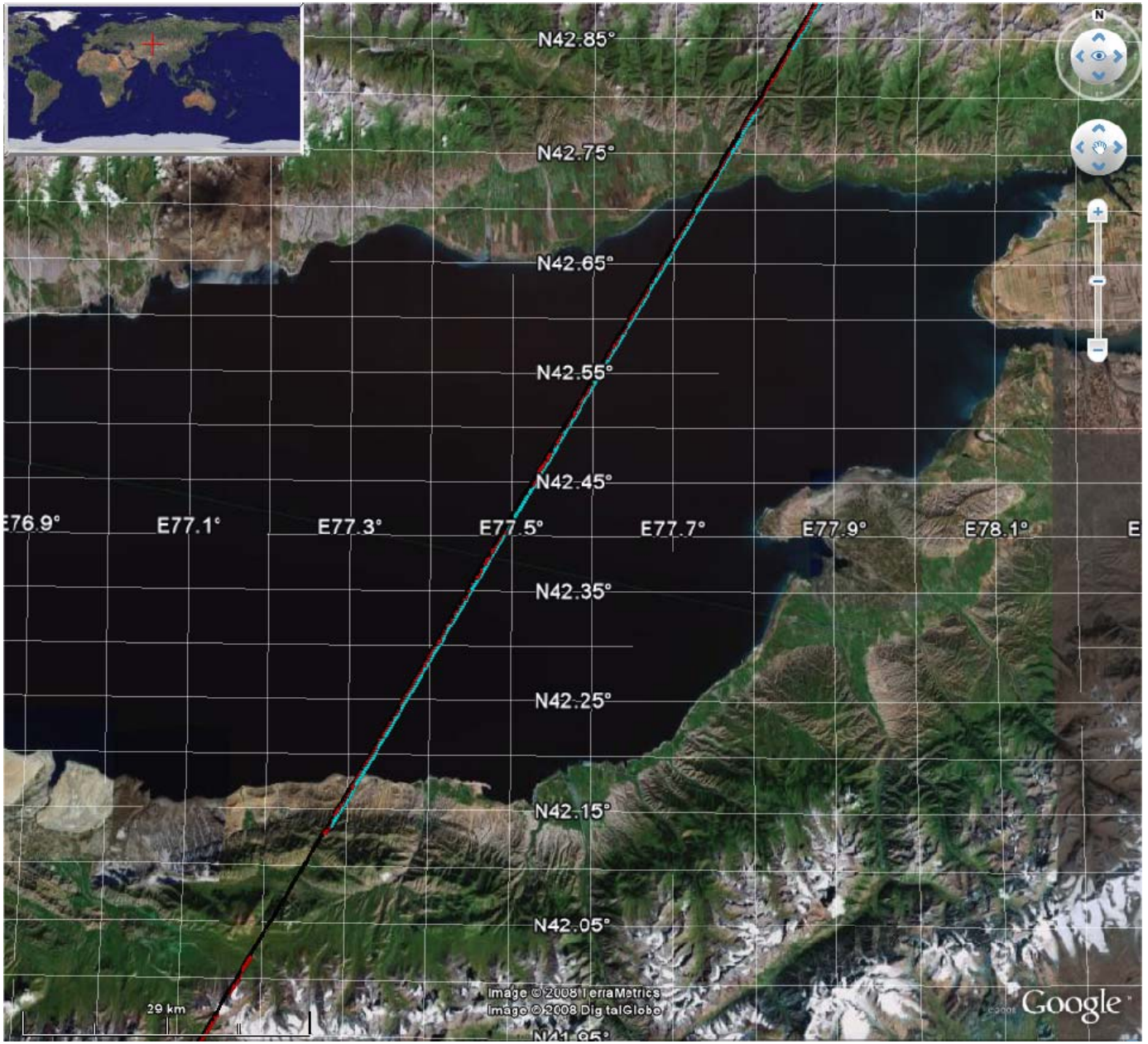


cnes
CENTRE NATIONAL D'ÉTUDES SPATIALES

Waveforms over lakes

Pass 131 - Issykul Lake - Kirghzistan – Cycle 1, 2 and 3 Jason-2

- Cycle 1 : SGT
- Cycle 2 : Median
- Cycle 3 : Diode/MNT



cnes
CENTRE NATIONAL D'ÉTUDES SPATIALES

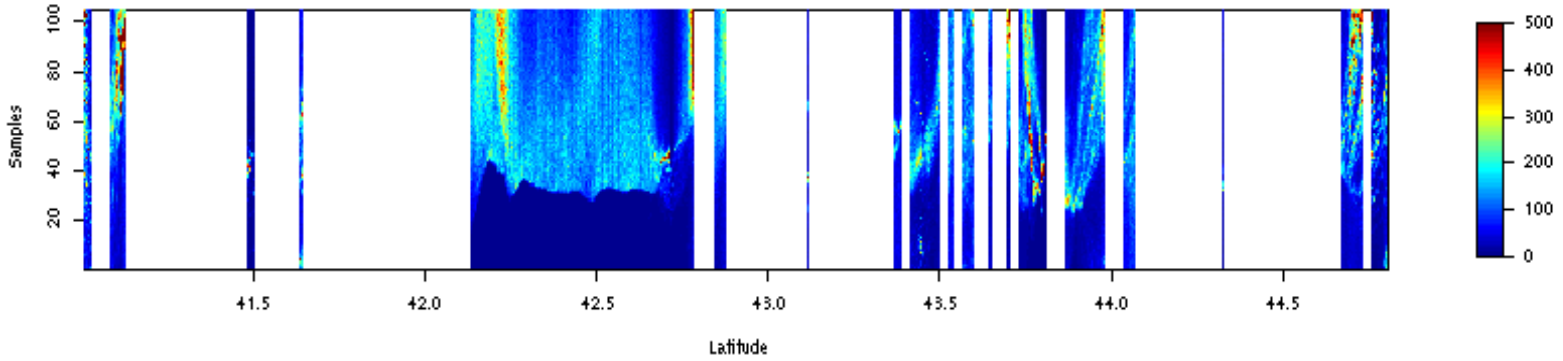
CLS
COLLECTE LOCALISATION SATELLITES

Waveforms over lakes

Jason-2

SGT

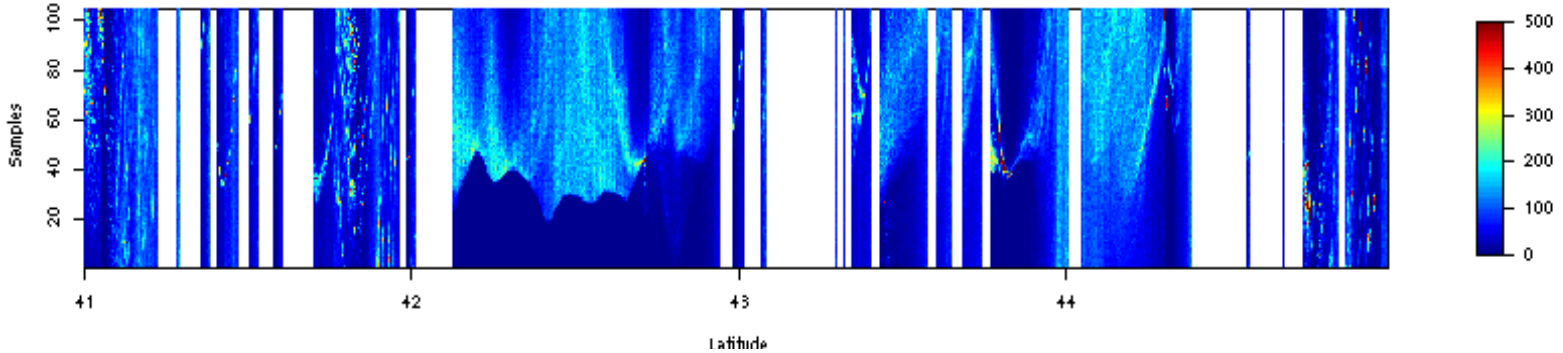
Cycle 1



Jason-2

Median

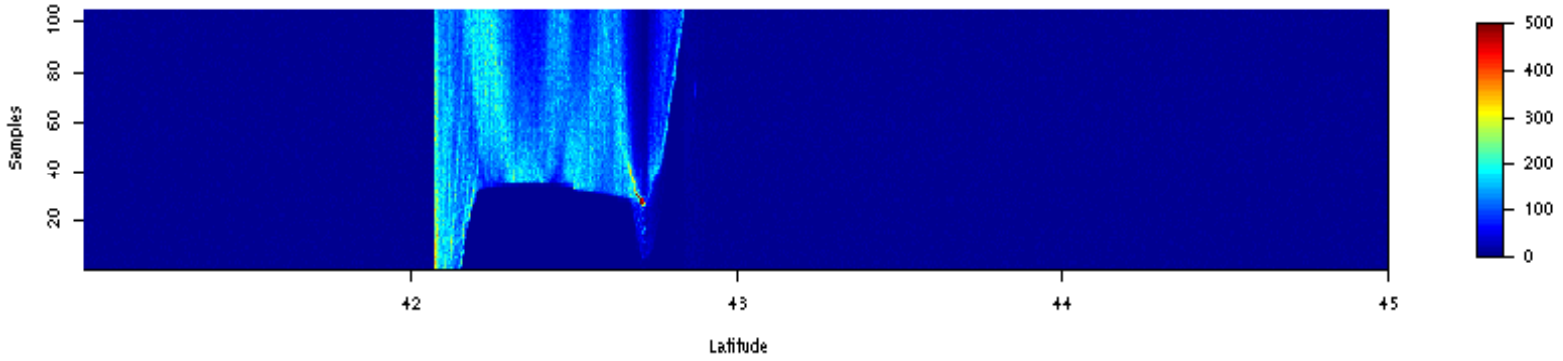
Cycle 2



Jason-2

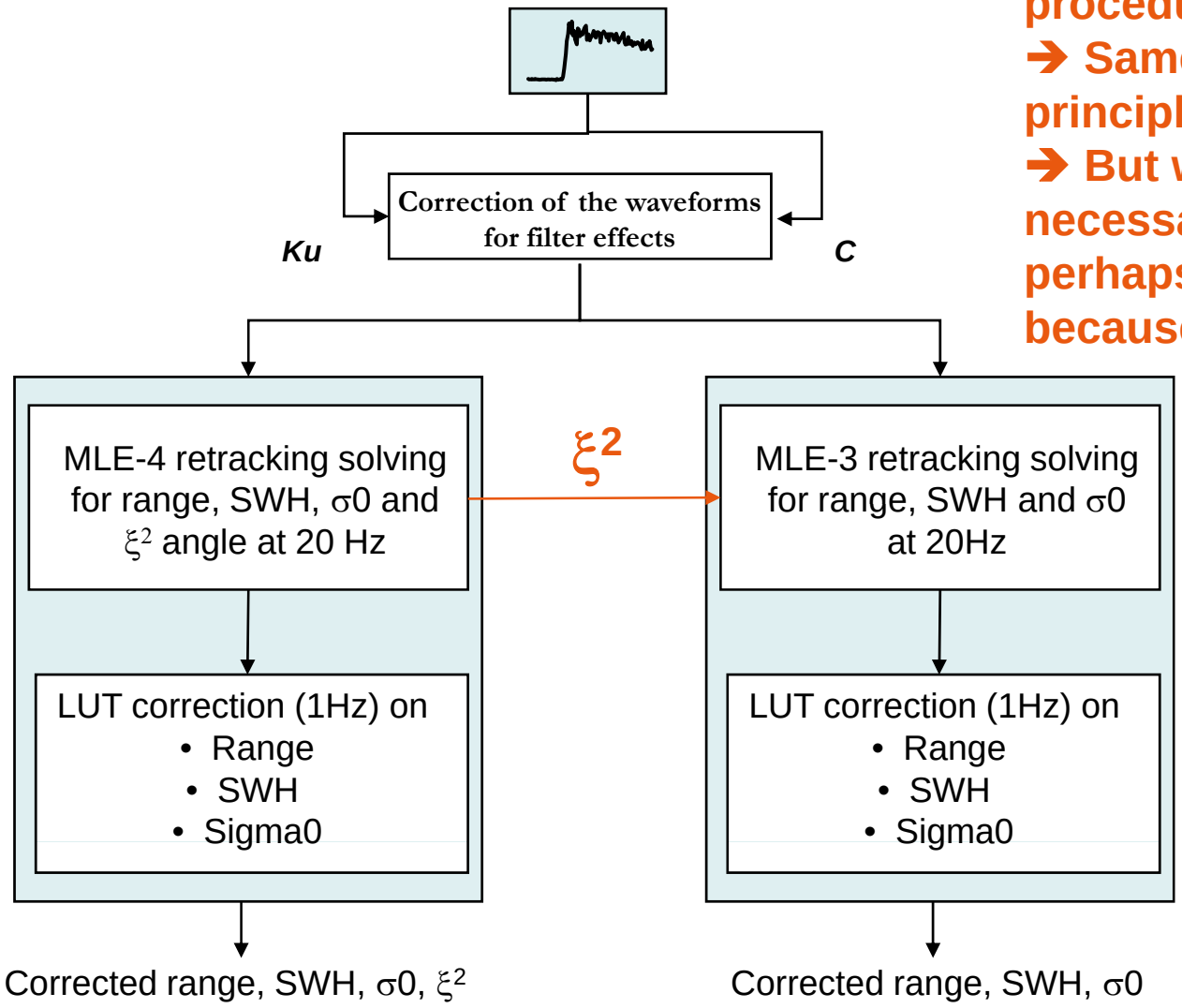
DIODE/DEM

Cycle 3



cnes
CENTRE NATIONAL D'ÉTUDES SPATIALES

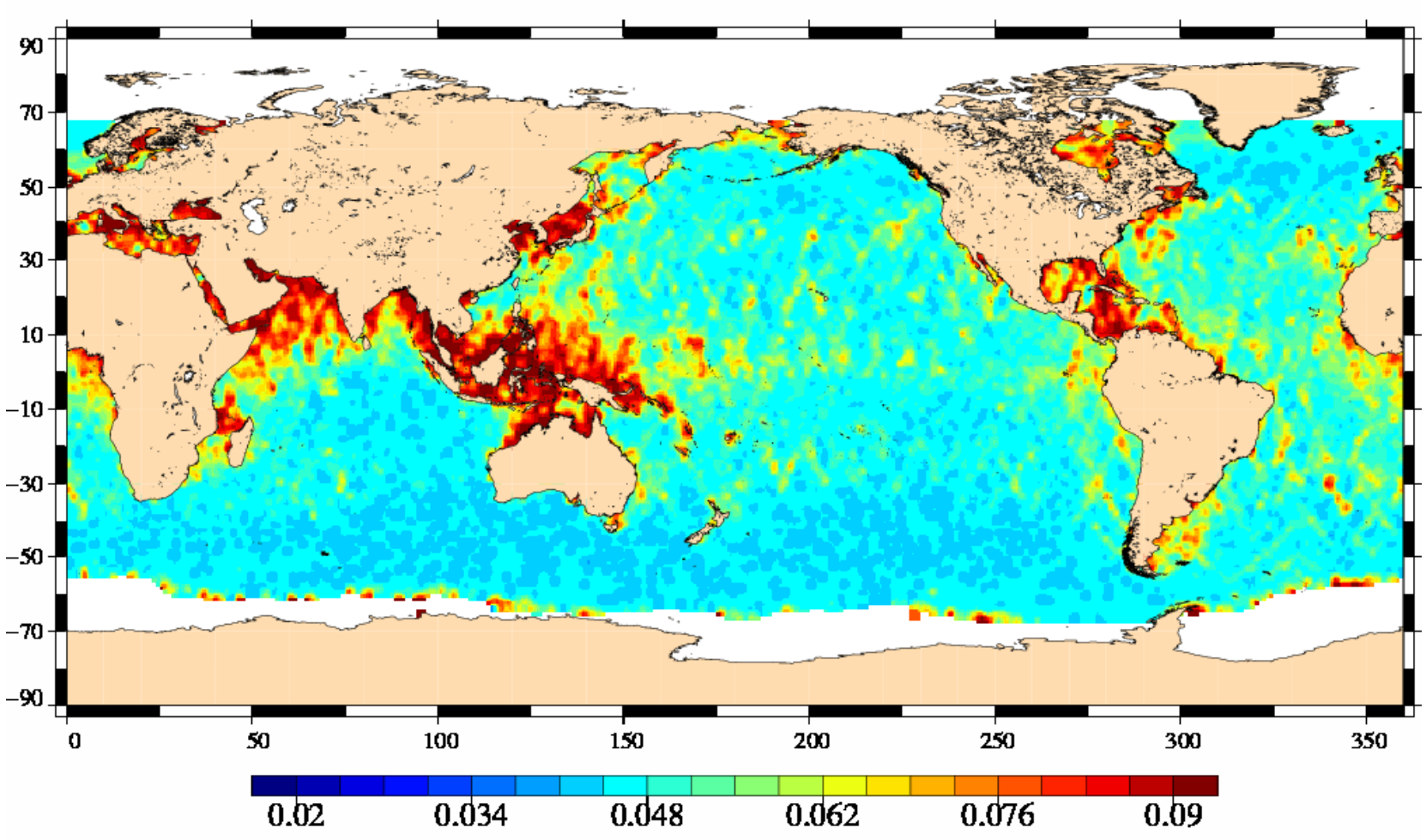
J1/J2 Waveforms Retracking scheme



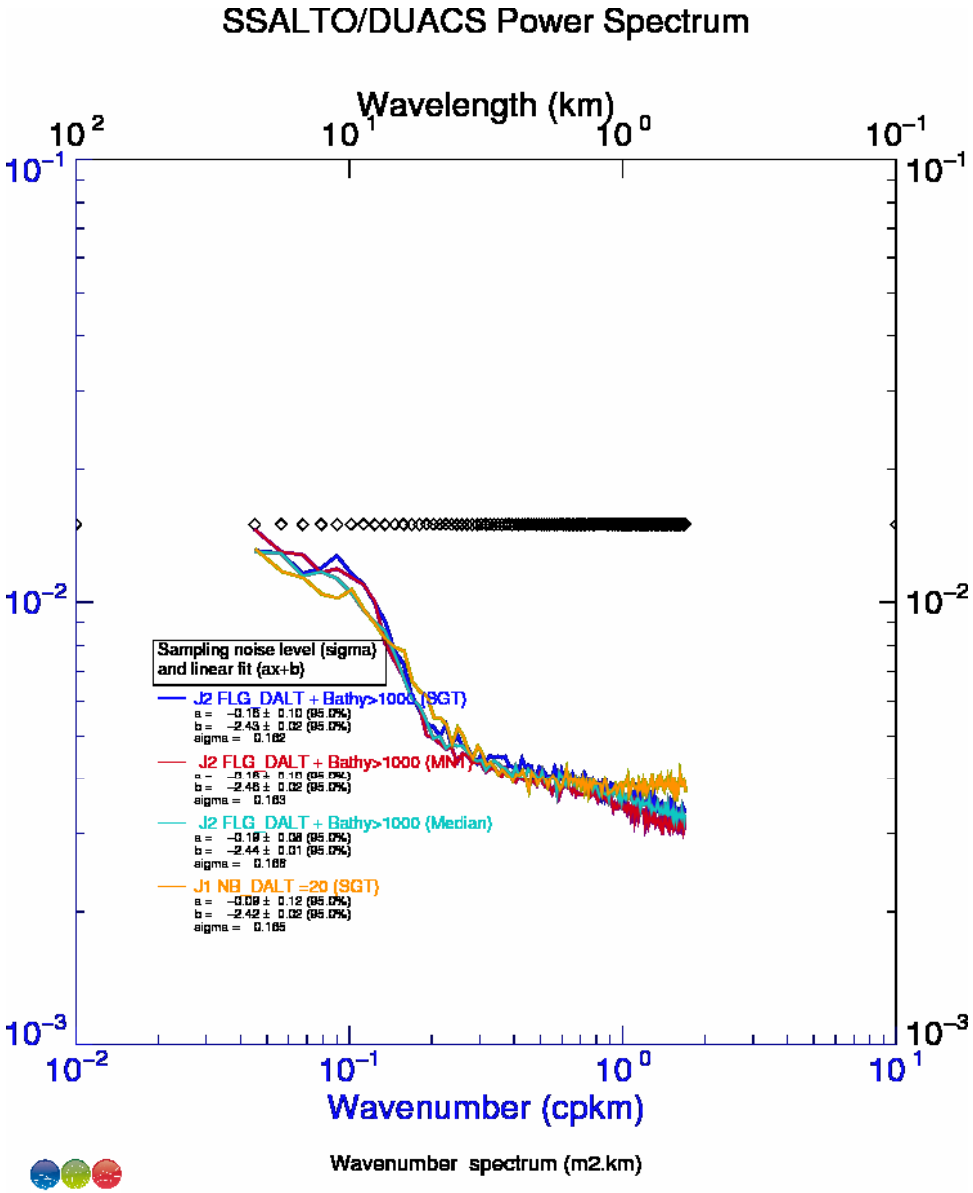
➔ **Same Retracking procedures for J1 and J2**
➔ **Same LUT correction principle**
➔ **But what was correct (and necessary) for J1, has perhaps to be modified for J2 because J2 is well pointed**

Impact on C band results

Jason-2 Mean Quadratic Error in C band



Jason-1/Jason-2 Spectra



➔ **Differences probably due to WF compression on J1 (under investigation)**

Jason-1/Jason-2 comparison on coastal zones : P187 on med. sea

From land to ocean

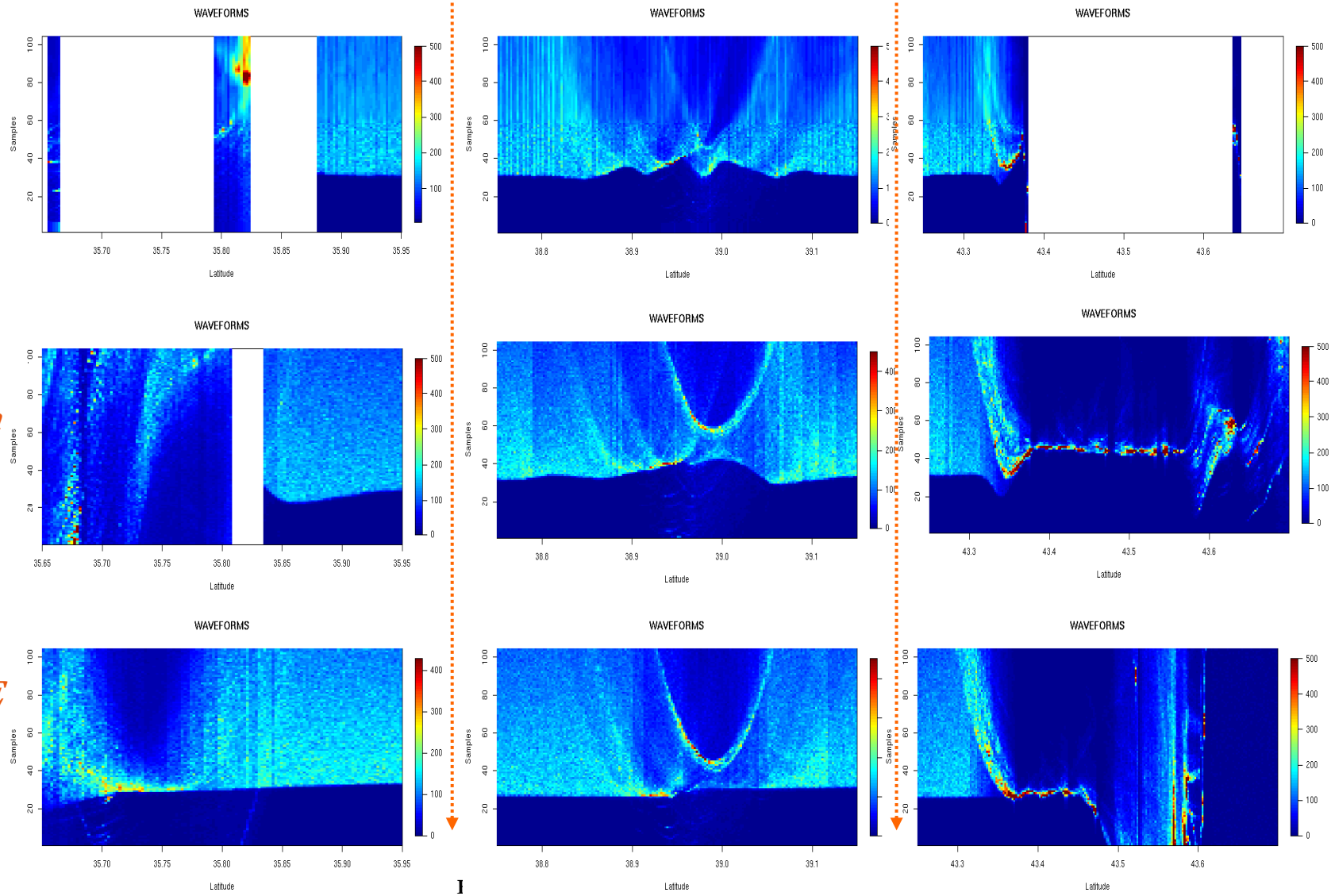
On islands

From ocean to land

J1 (cycle 240)

J2 Median (cycle 8)

J2 DIODE DEM (cycle 7)



cnes
CENTRE NATIONAL D'ÉTUDES SPATIALES

CLS
COLLECTE LOCALISATION SATELLITES

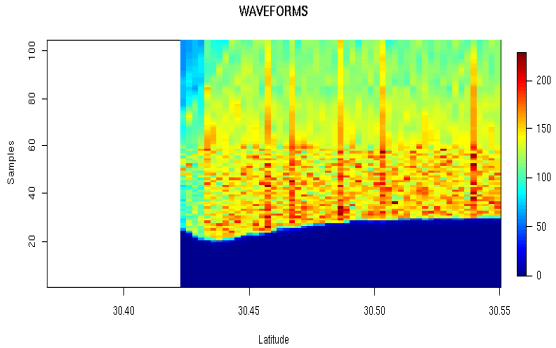
Jason-1/Jason-2 comparison on coastal zones : P33 over Greece

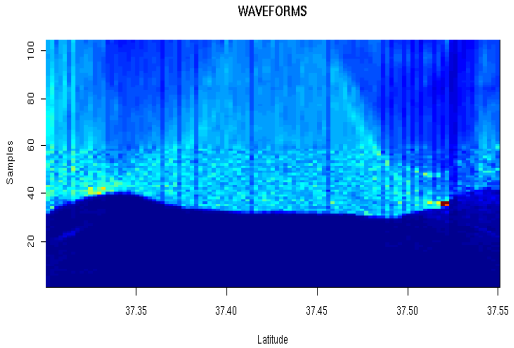
From land to ocean

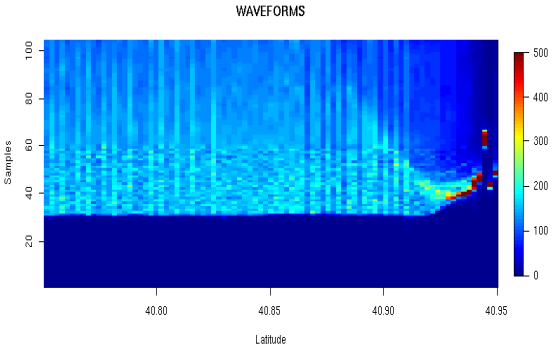
On islands

From ocean to land

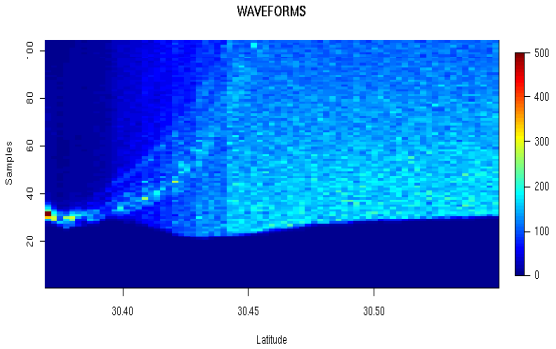
J1 (cycle 240)

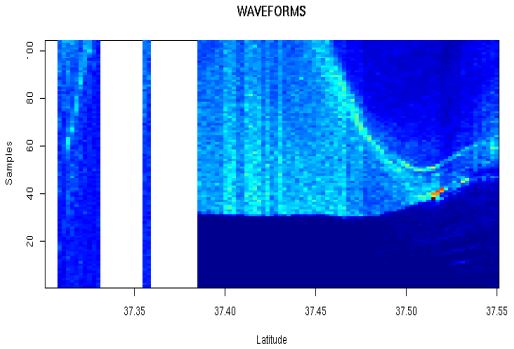


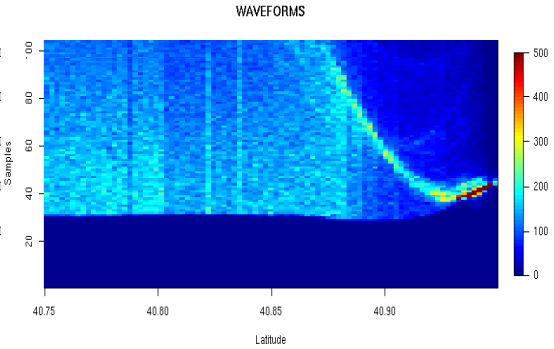




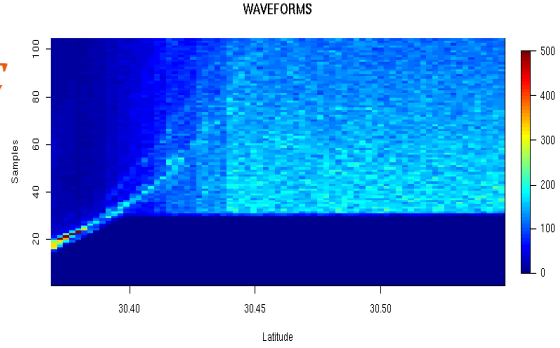
J2 Median (cycle 8)

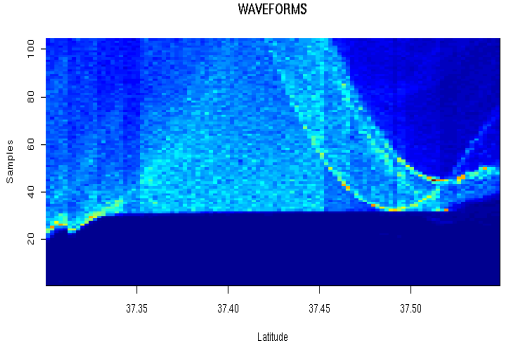


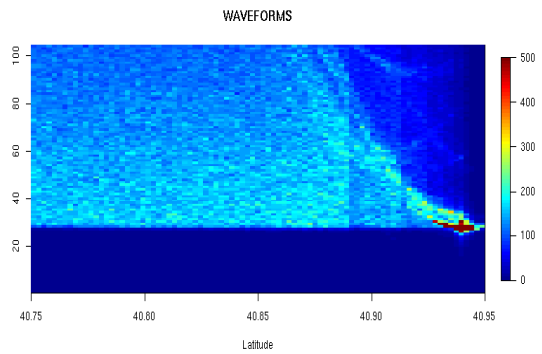




J2 DIODE DEM (cycle 7)



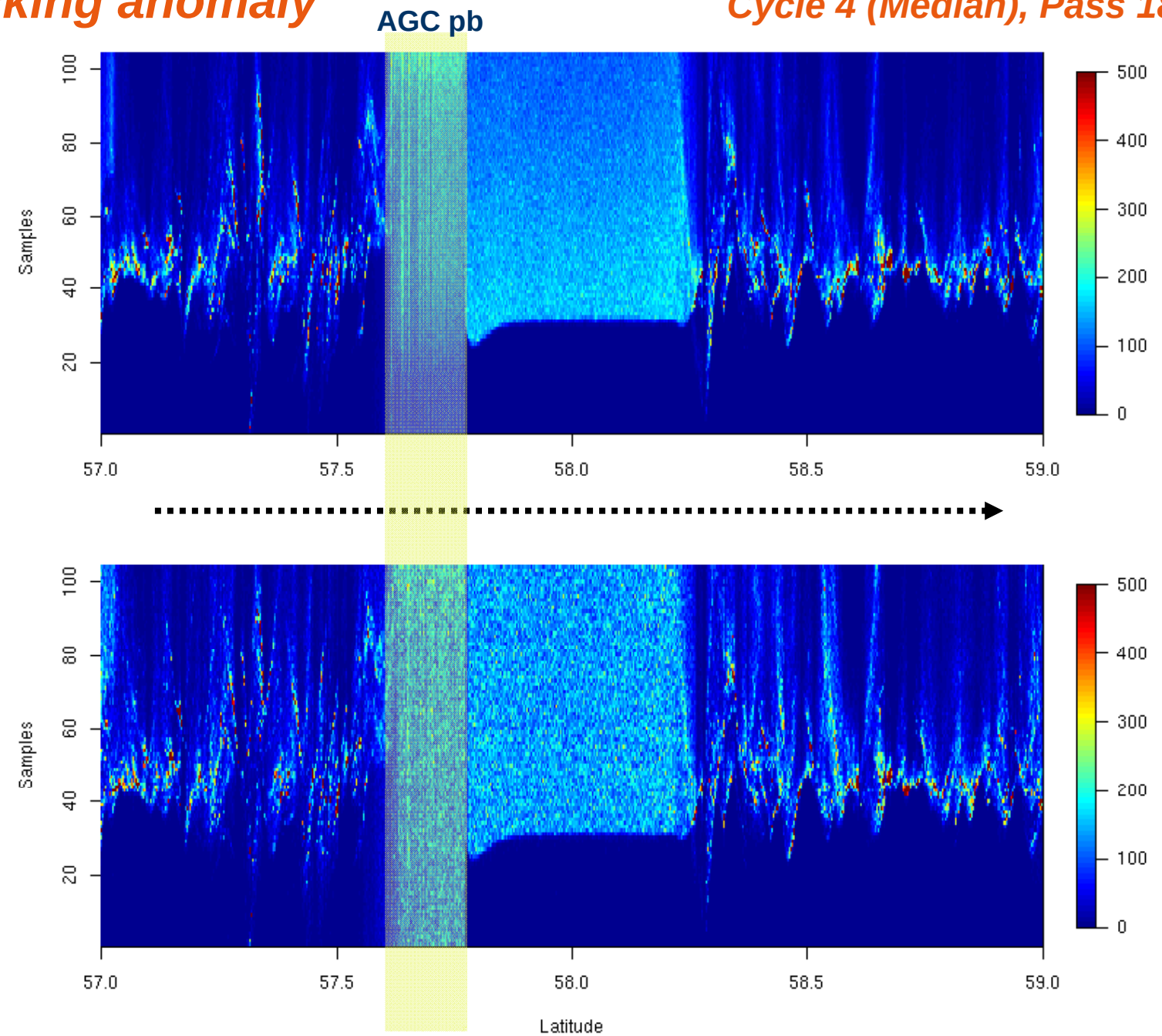




cnes
CENTRE NATIONAL D'ÉTUDES SPATIALES

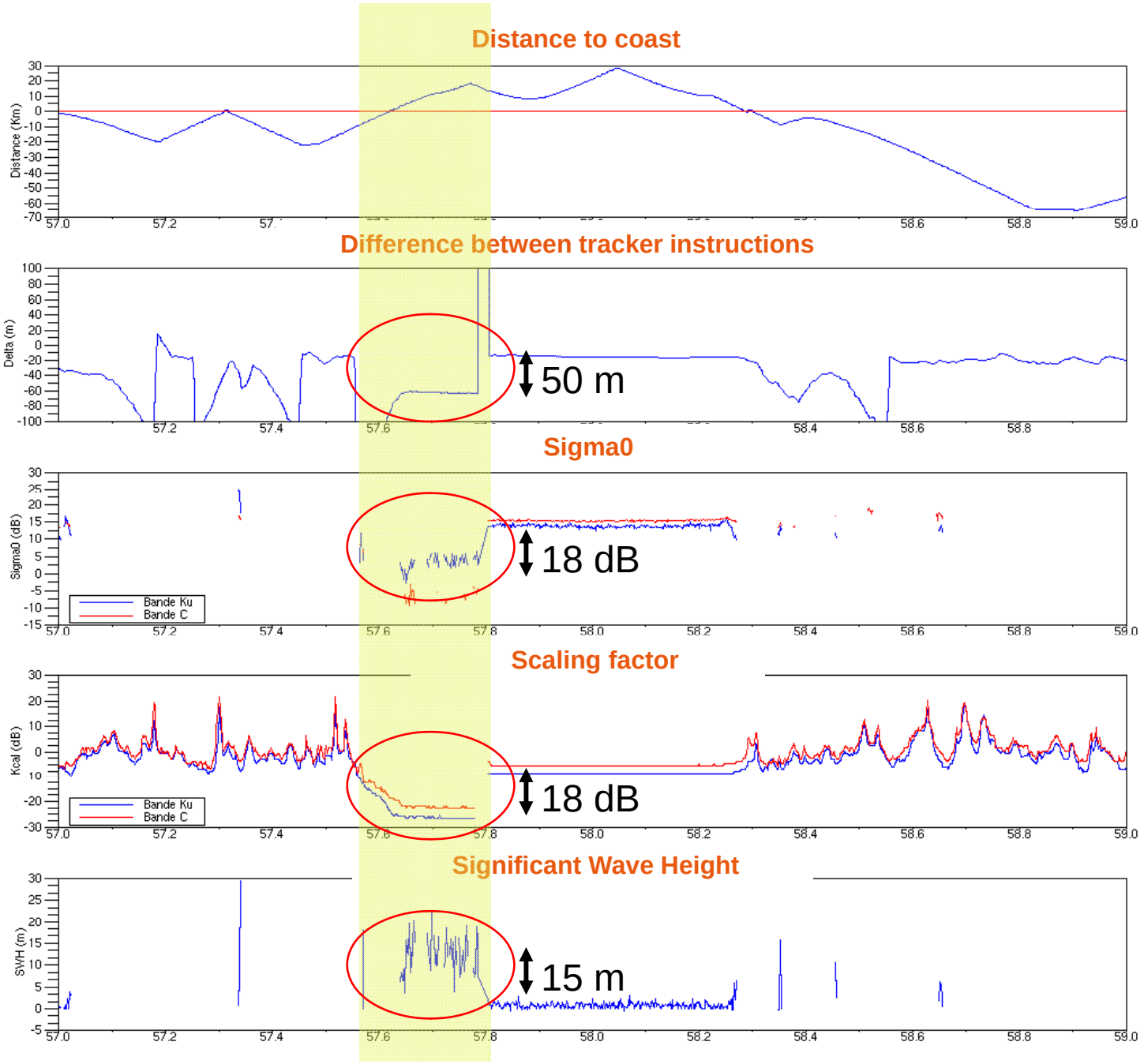
Tracking anomaly

Cycle 4 (Median), Pass 187



Tracking anomaly

Cycle 4 , Pass 187

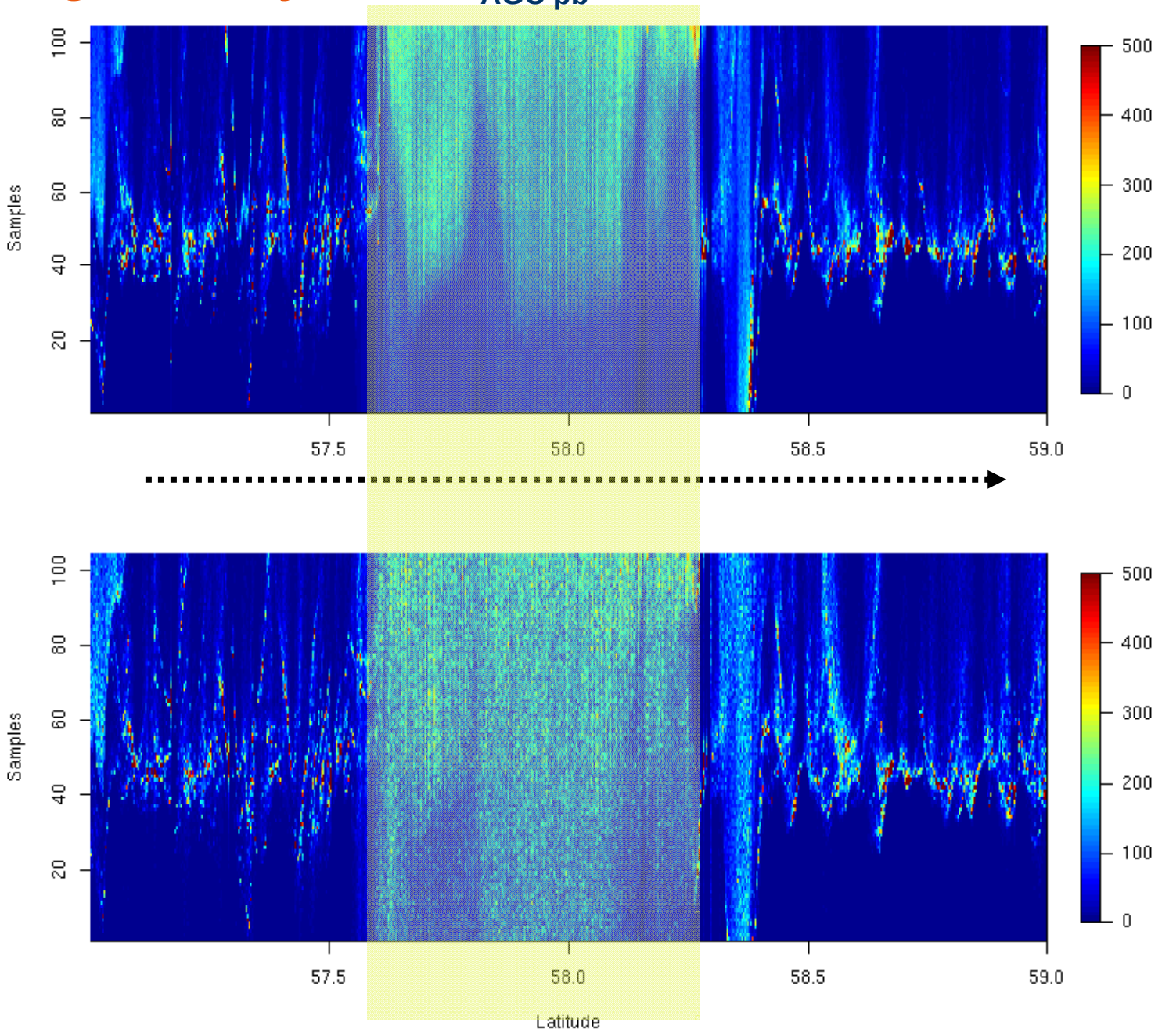


cnes
CENTRE NATIONAL D'ÉTUDES SPATIALES

CLS
COLLECTE LOCALISATION SATELLITES

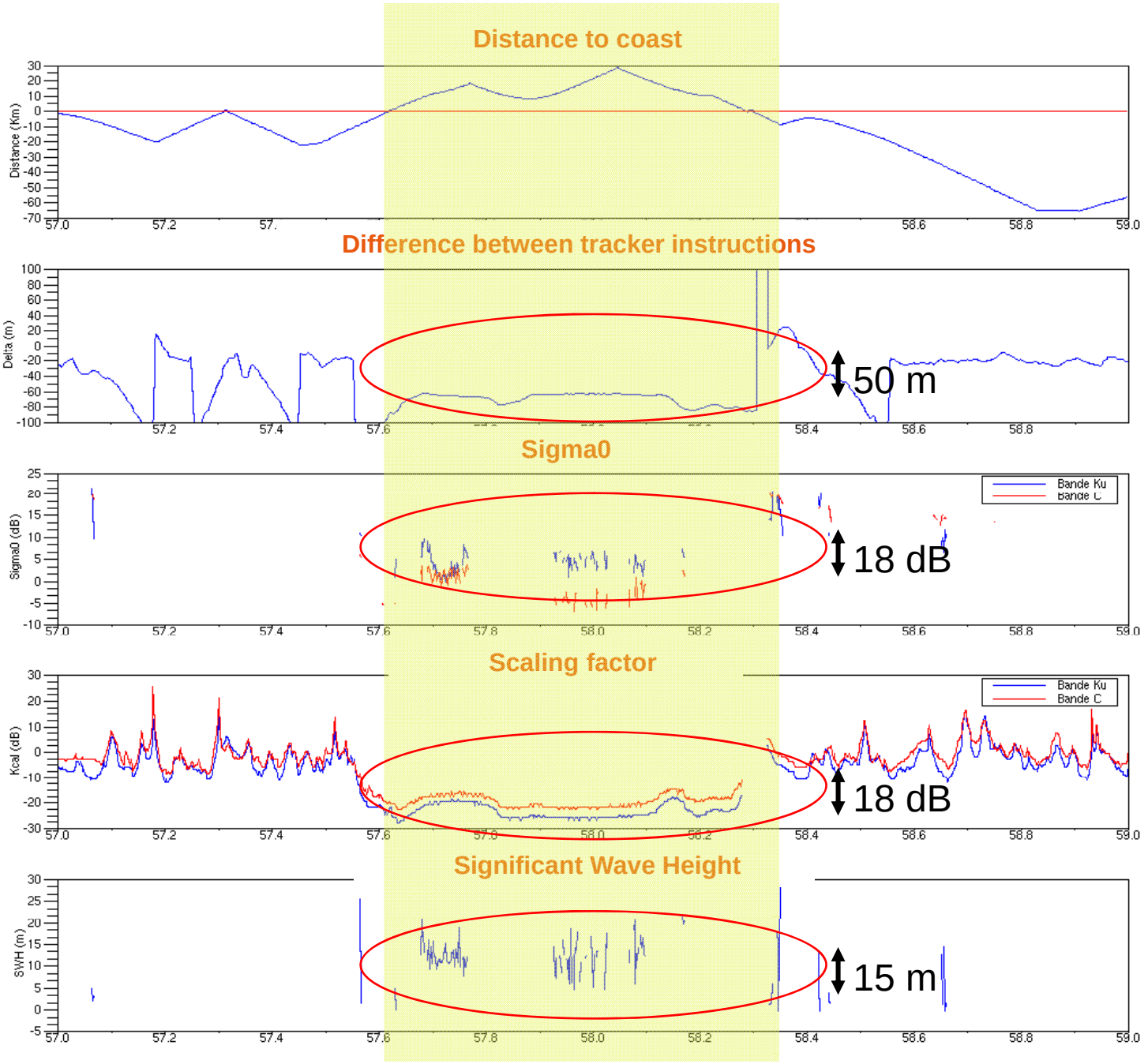
Tracking anomaly

Cycle 2 (Median) , Pass 187



Tracking anomaly

Cycle 2 , Pass 187



cnes
CENTRE NATIONAL D'ÉTUDES SPATIALES

CLS
COLLECTE LOCALISATION SATELLITES

Tracking anomaly

- ➔ Only in median tracking mode (not in DIODE/DEM)
- ➔ Over land but sometimes remains over ocean for some seconds
- ➔ Concerns some very small segments per cycles
- ➔ No impact on data quality. These data are edited by Calval quality criteria
- ➔ under investigation on CNES/CLS and Thales side

Impact on Rain flag

- On Jason-1, Rain Flag determined using the Ku/C AGC relation
- No more valid on Jason-2, because different from J1
- Ku/C Sigma0 relation cannot be used as for J1 GDR A (MLE3)
- Under investigation

Conclusions

- Very good results wrt Jason-1
- Some points are under analysis (DEM to be updated, …)
- No need of more data (more cycles) for the WF, tracking and retracking analysis

Thank you !