Jason-CS Poseidon-4 Modes of Operation

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ESA-ESTEC

Documents provided

esa	JASON-CS	Doc. No.: JC-TN-ESA-MI-0036 Issue: 3.0 Date: 10 Sept 2012 Page: 1

Jason-CS

Poseidon-4 Modes of Operation

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JASON CS – POSEIDON 4

Summary of interleaved mode requirements and preliminary results
(CN interleaved ref. JC-CN-TAF-P4-00070)

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Approval evidence is kept within the documentation management system.

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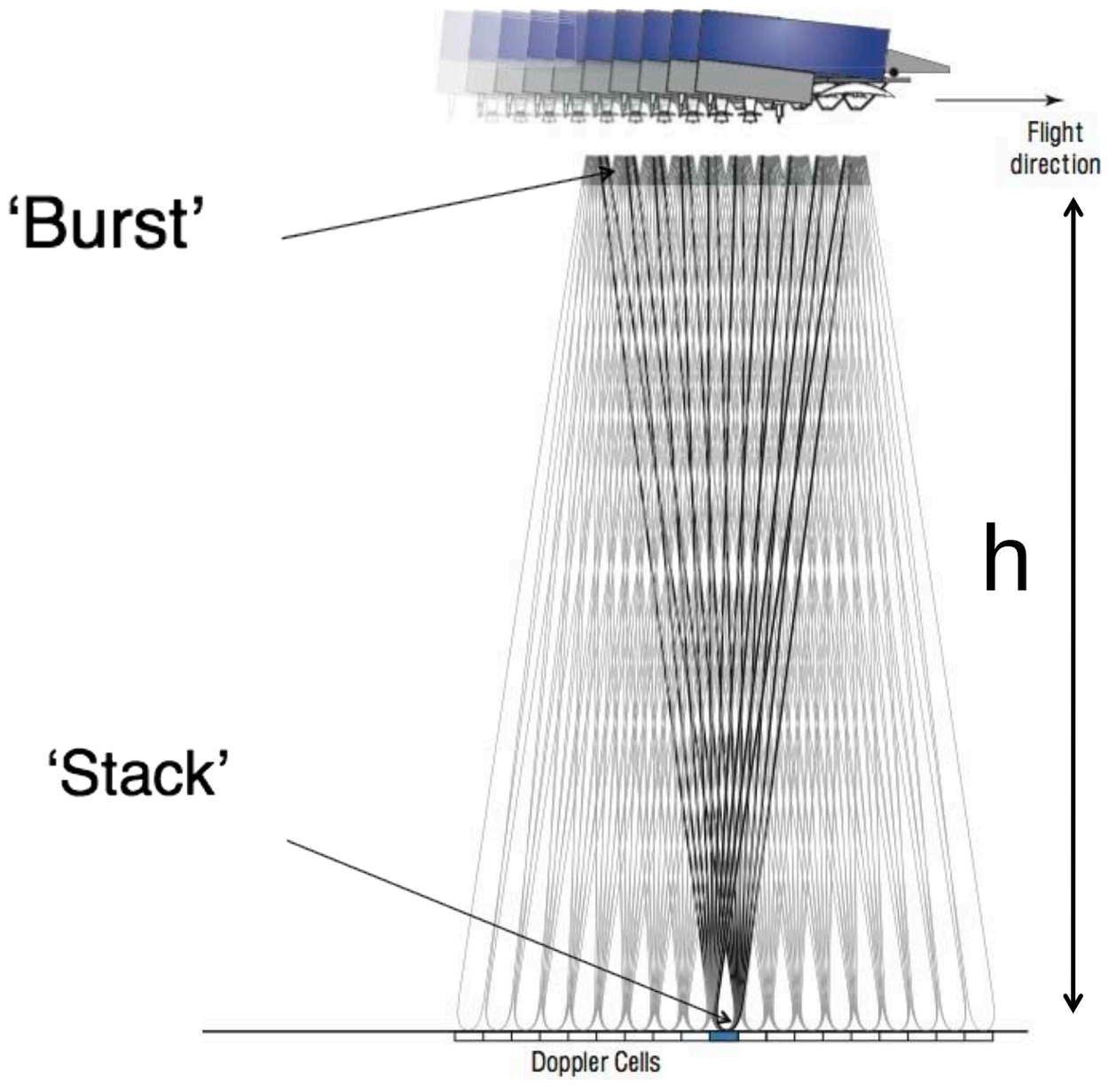
Key Performances (LRM)

	Jason-3 (cm)	Jason-CS (cm)
Instrument range noise (MLE-3)	1.7	1.5
Ionosphere	0.5	0.5
Sea State Bias	2	1
Dry Troposphere	0.7	0.7
Wet troposphere	1.2	1
Altimeter Range RSS	**3**	**2.25**

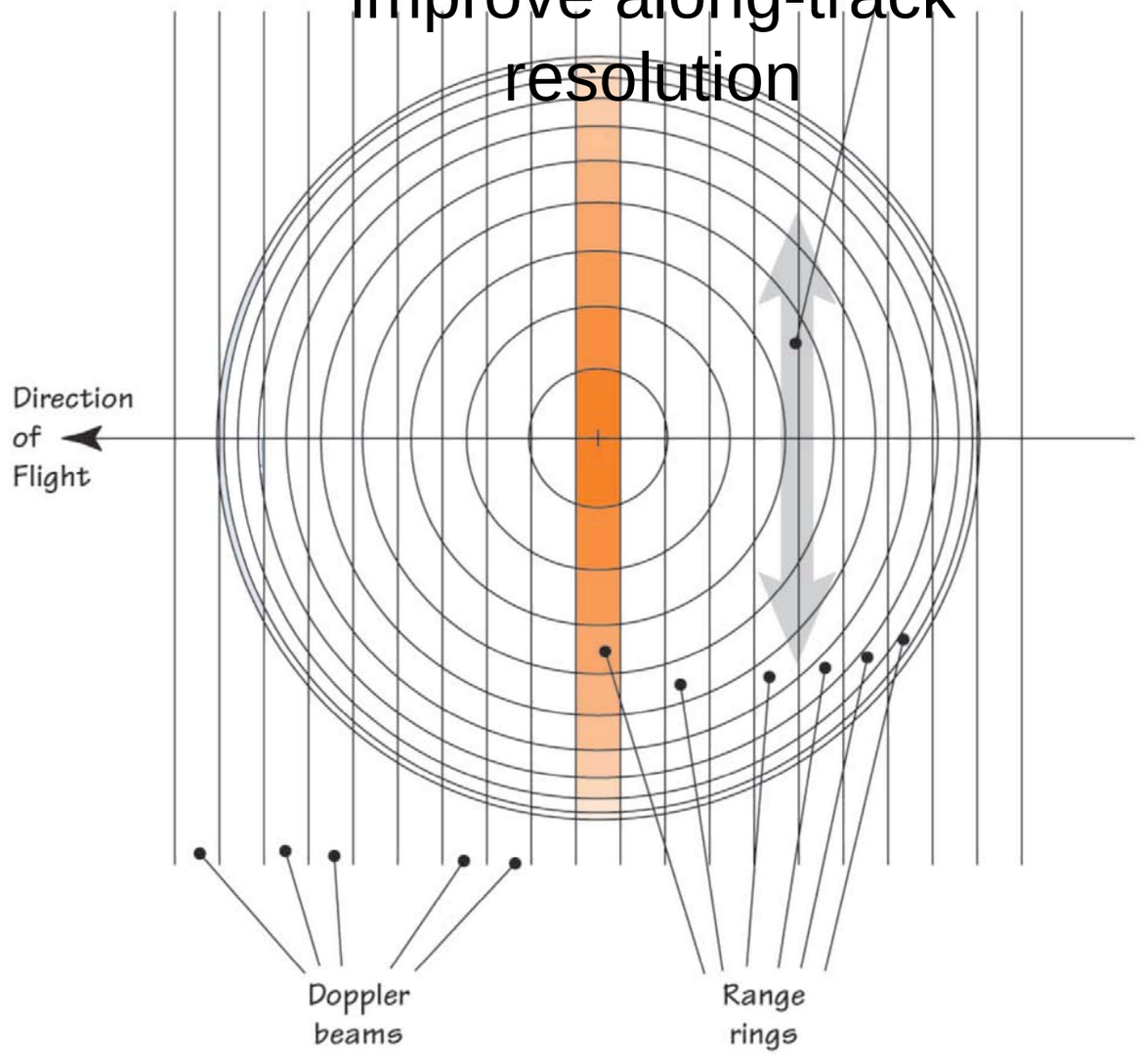
- Based on Non-Time Critical Product
- Jason-CS adopts the goal for Jason-3 as requirement

Poseidon-4 Timing



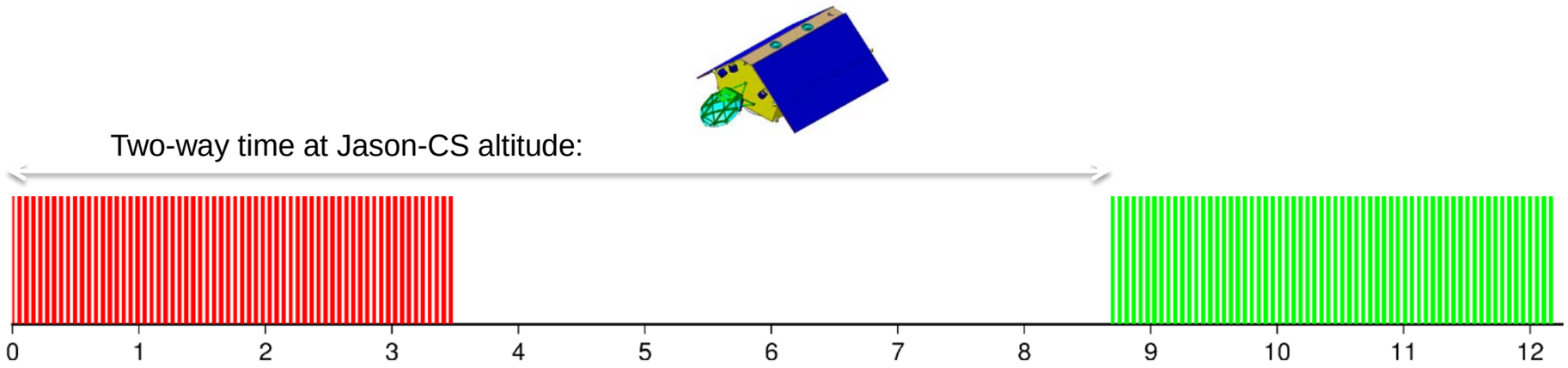
Resolution R(h)

SAR filters rates of change of phase to improve along-track resolution

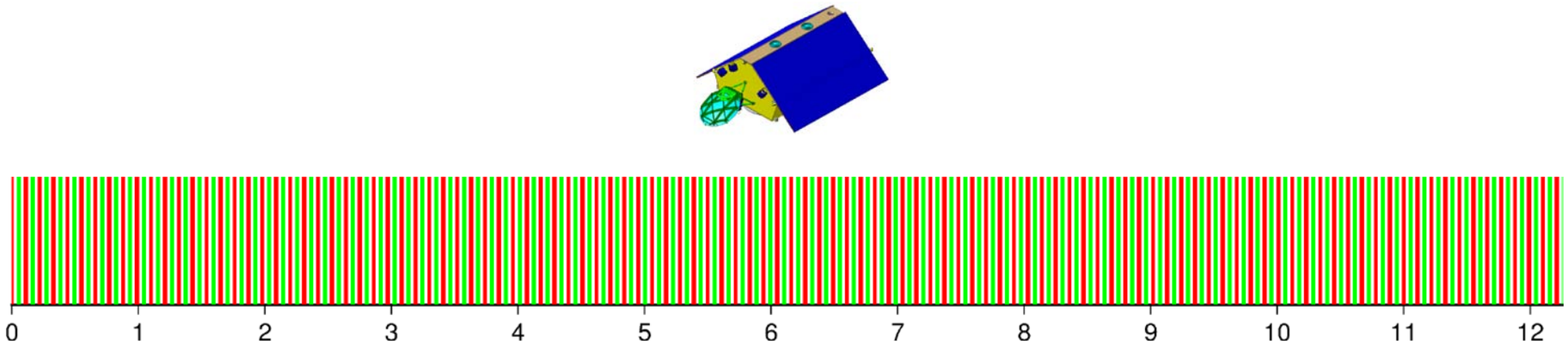


Poseidon-4 Timing

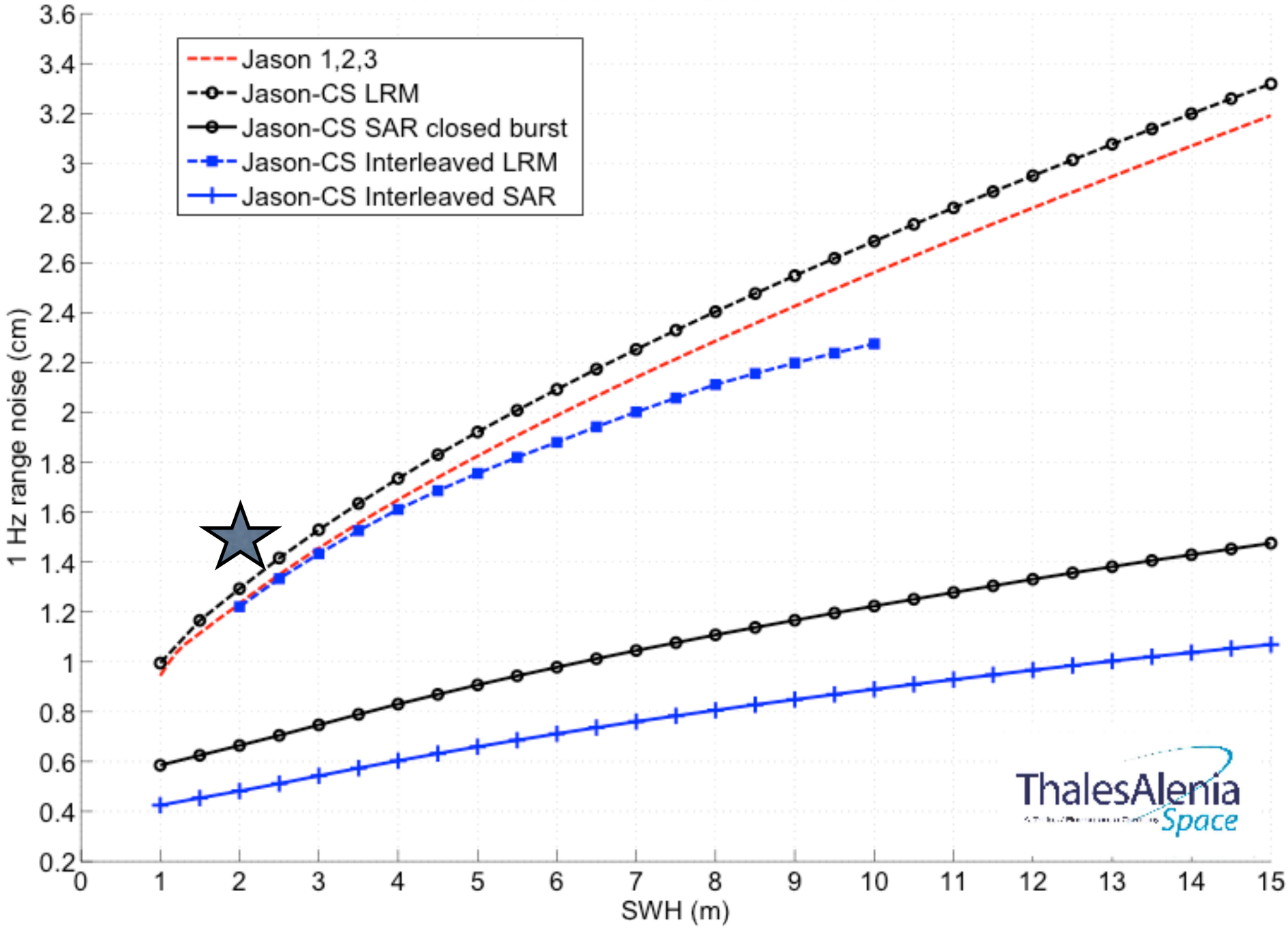
Closed Burst



Open Burst ‘Interleaved’



Poseidon-4 Theoretical Performances



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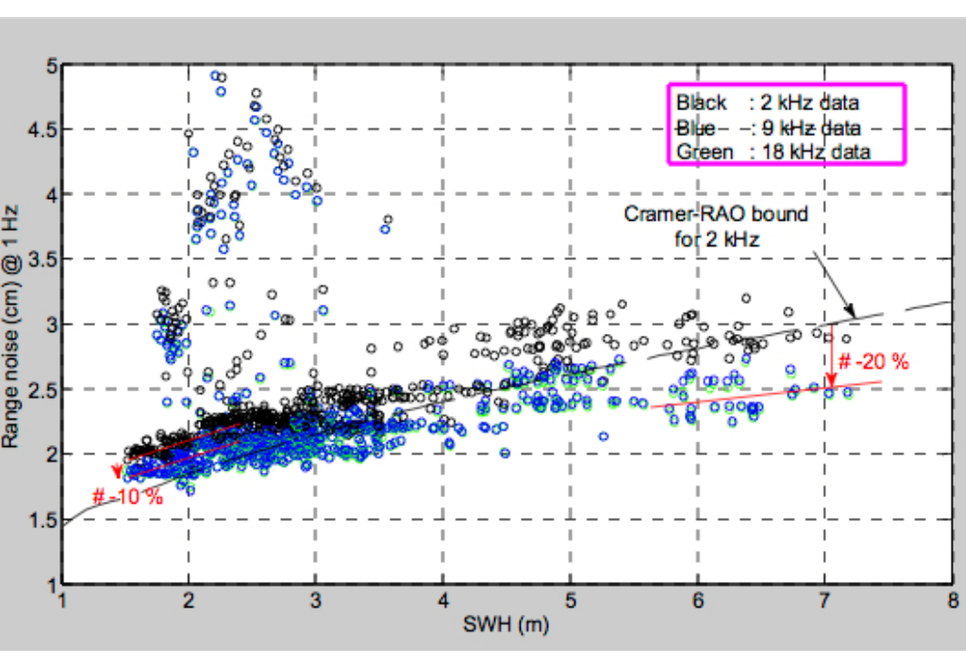
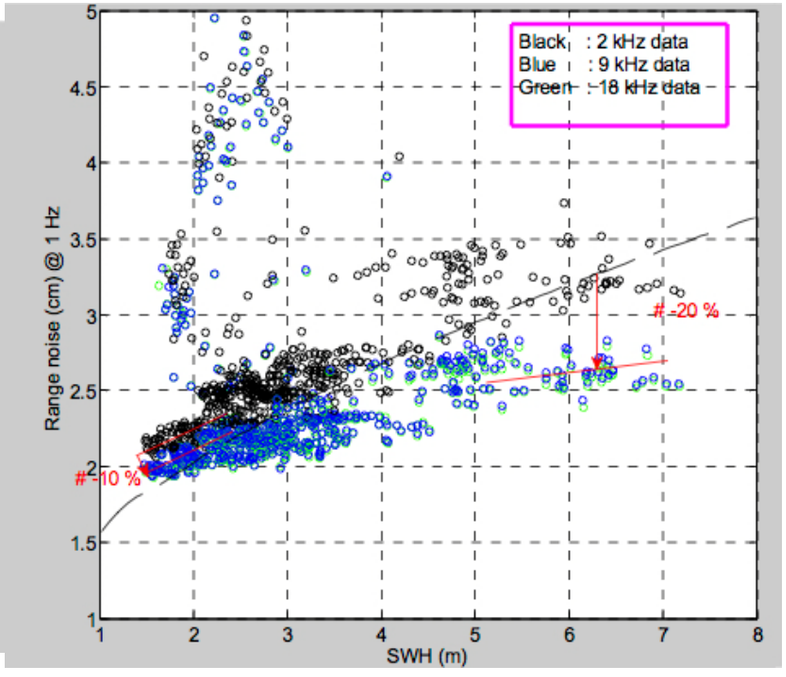
Interleaved mode performances

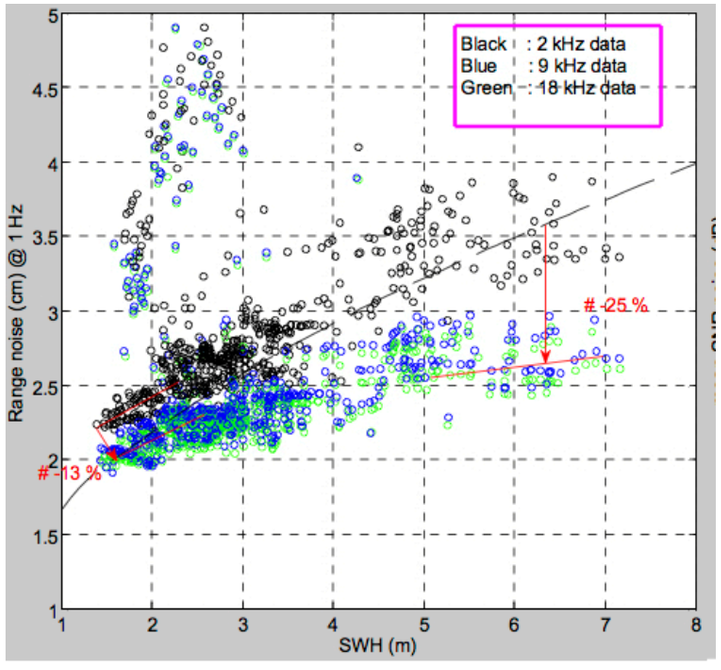
LRM performances based on CS-2 SAR data



CS-2 data
SNR 26dB



SNR degraded to
15dB
(Jason-CS case)



SNR degraded
to 13dB

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Poseidon-4 Interleaved Performances

H (km)	LRM SNR Ku baseline (dB)	LRM SNR Ku interleaved (dB)	SAR SNR gain Baseline (dB)	SAR SNR gain Interleaved (dB)	LRM SNR C Baseline (dB)	LRM SNR C Interleaved (dB)
1332	14.4	12.4	10.8	23.2	13.5	11.5
1347	14.2	12.2	10.7	23.0	13.3	11.3
1362	14.0	12.1	10.7	22.8	13.1	11.2

Ku-Band Requirement=12dB
C-Band Requirement =11dB

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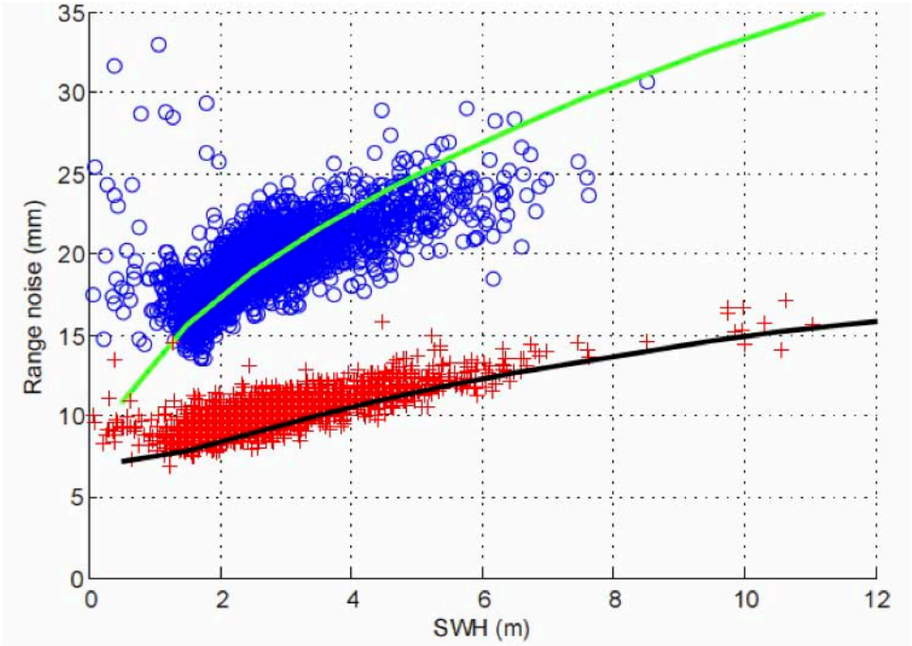
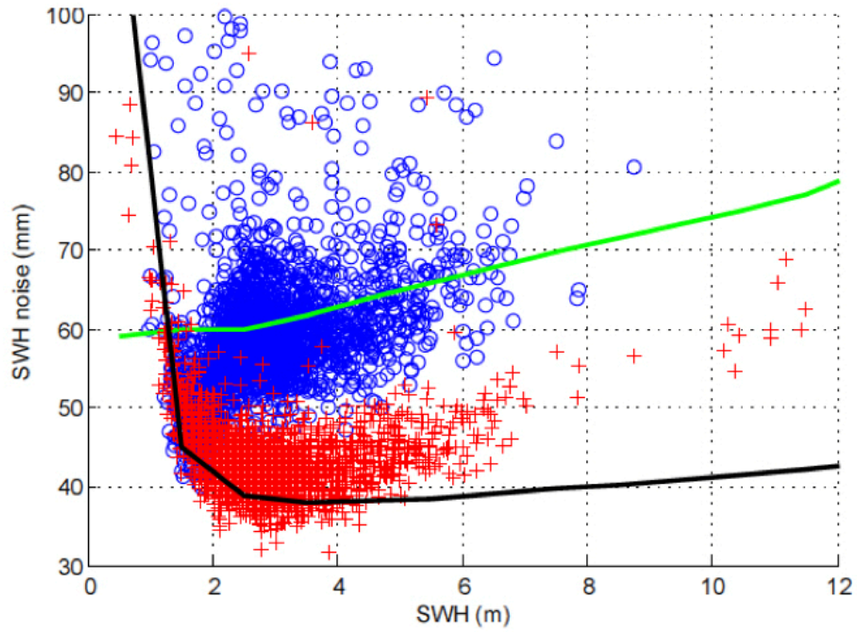
Poseidon-4

SAR expected performances derived from CryoSat data





Range noise

SWH noise

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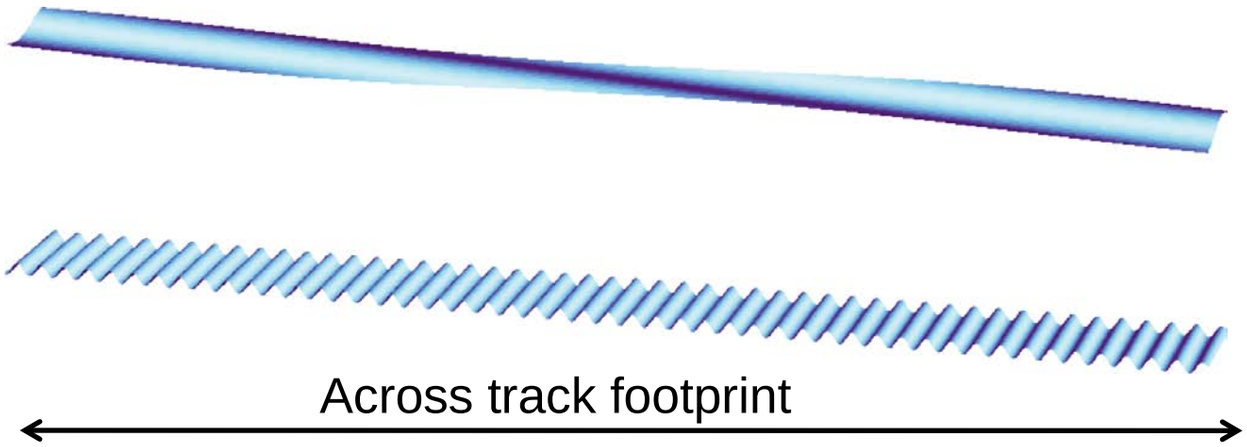
SAR Mode Key Questions

•How accurate are retrievals as a function of directional wave spectra?



• 300 metre along track and across track waves.

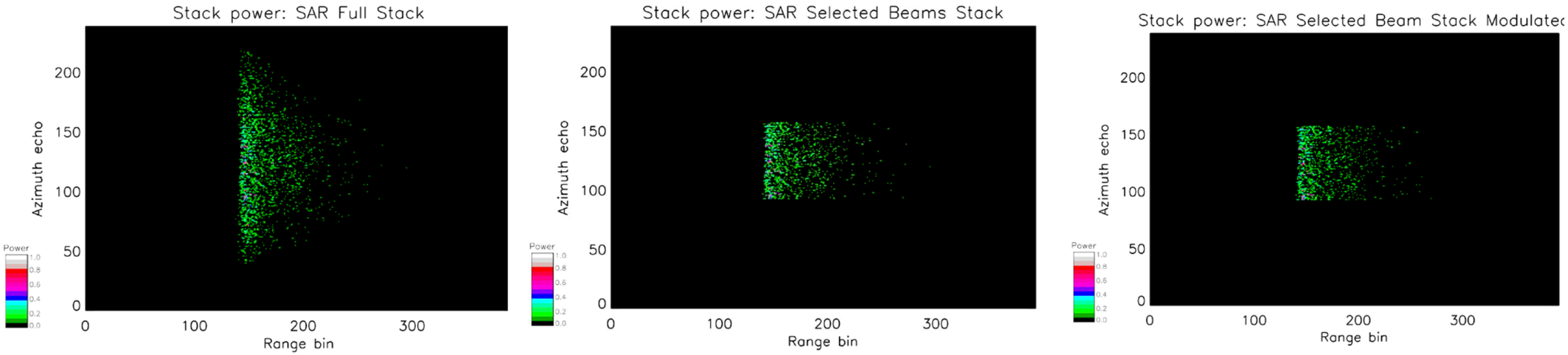
•Sea state bias?

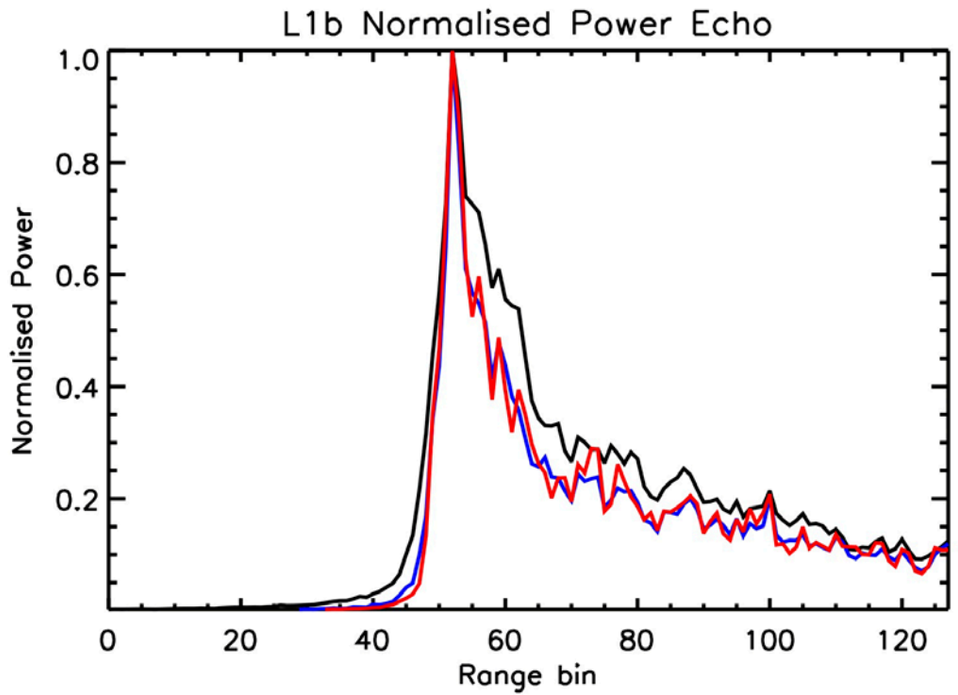
• Verification of the CryoSat ocean performances at the Jason orbit are needed.

• Handling of pointing in the processing

SAR Mode Key Questions

Optimisation of stack filtering to improve leading edge and sensitivity to SWH?



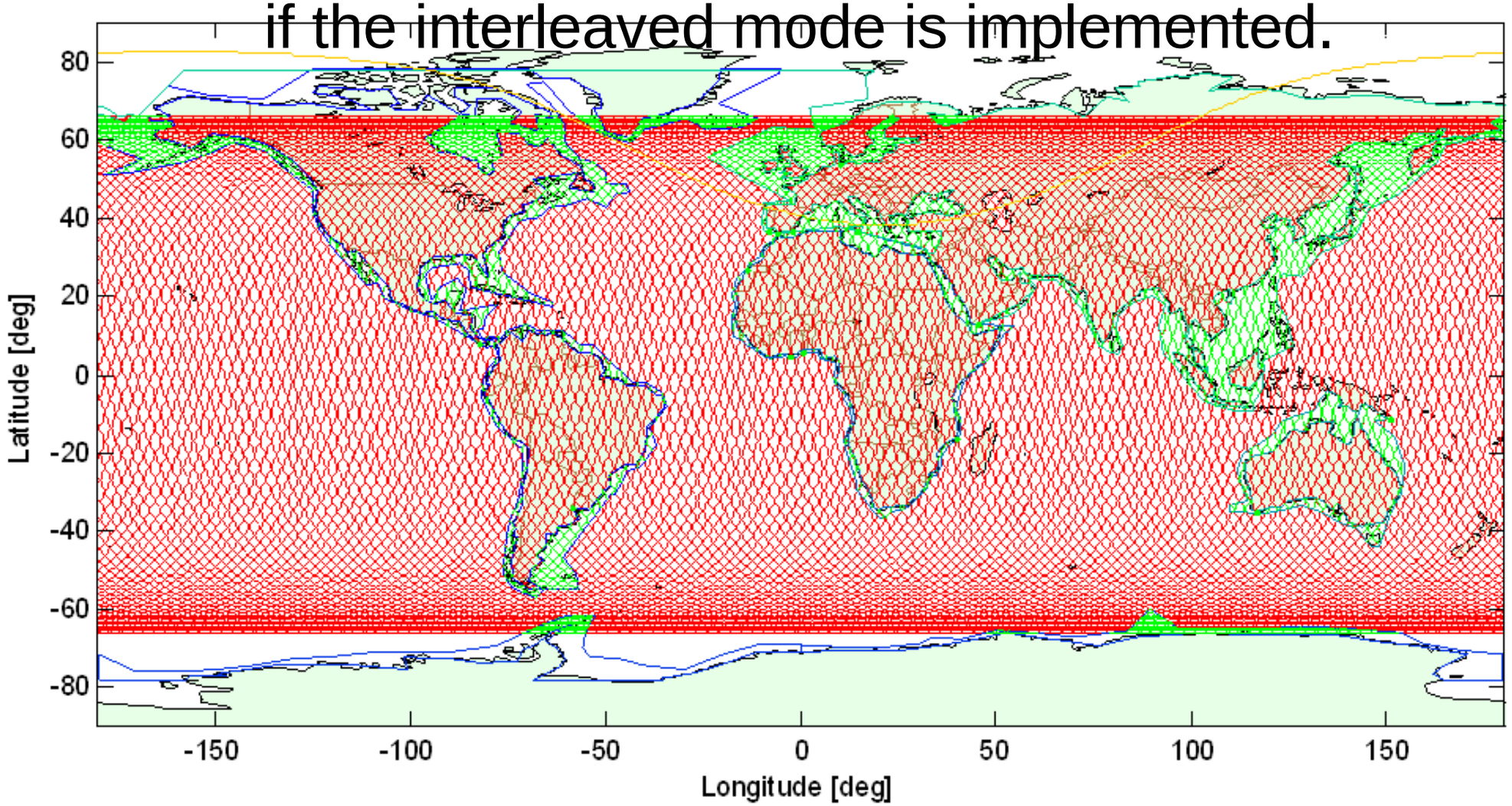
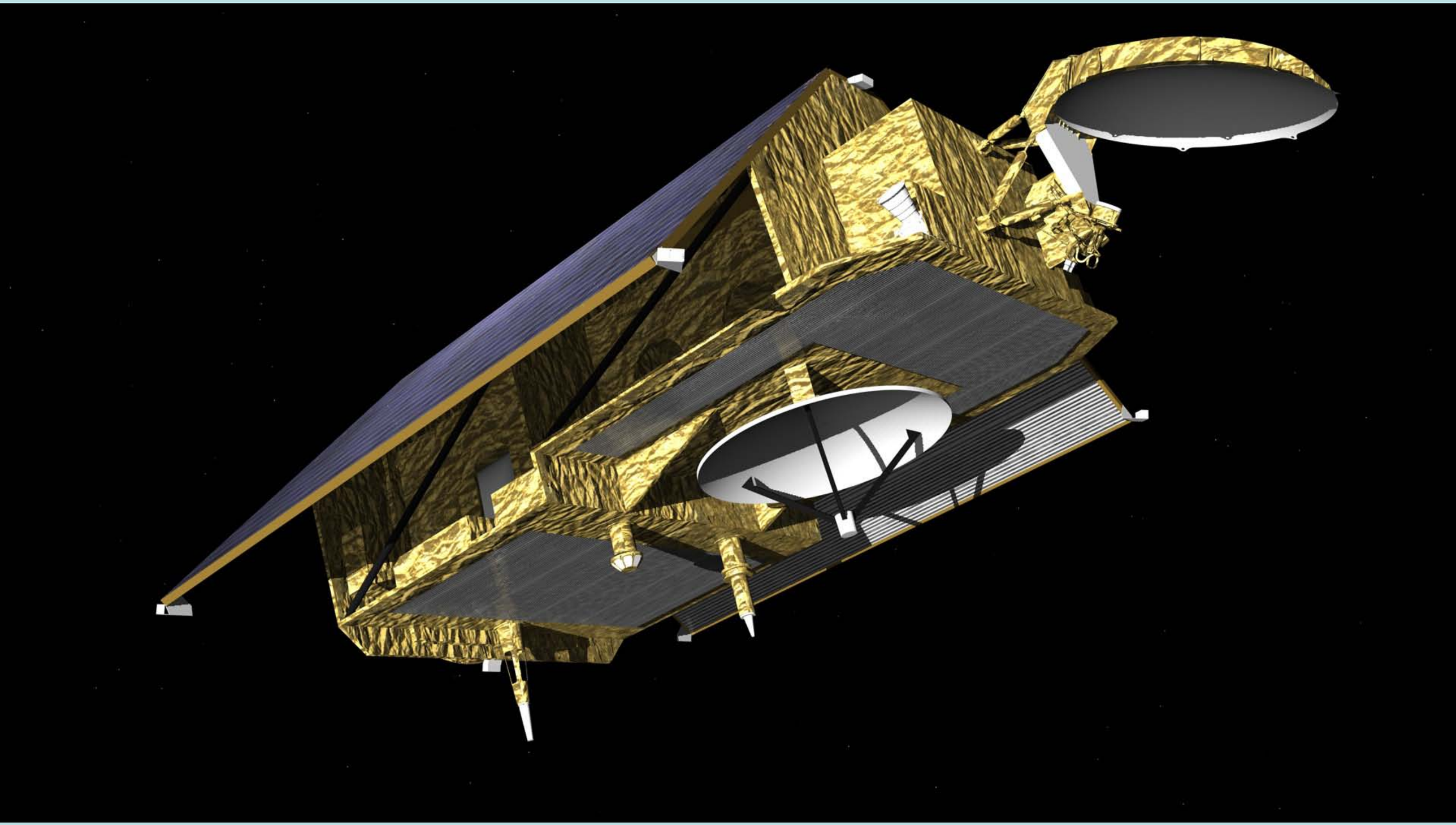


Example from CryoSat

Jason-CS Sizing: Baseline operation

Initial mode mask for sizing system in terms of data, power and thermal:

This is not be the final mode mask which would become **obsolete** if the interleaved mode is implemented.



Thank You