

Arktalas wave in ice paper cases

(Sentinel1/Sentinel2/Sentinel3/Icesat2/CFOSAT)

Collard Fabrice, ODL

Ardhuin Fabrice, Ifremer

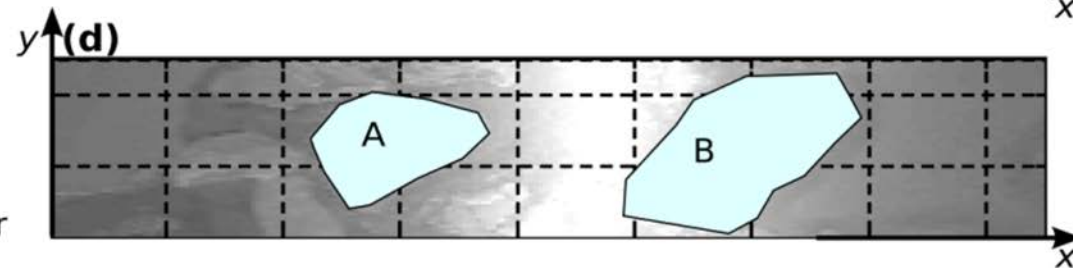
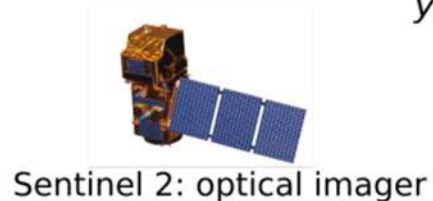
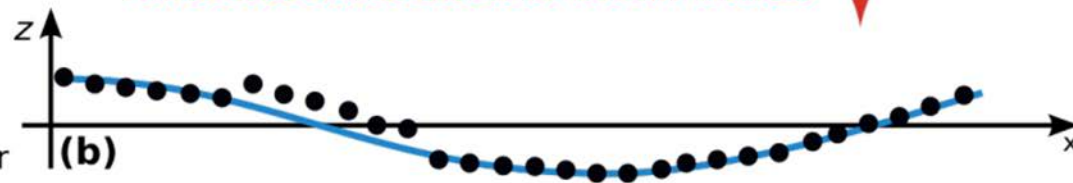
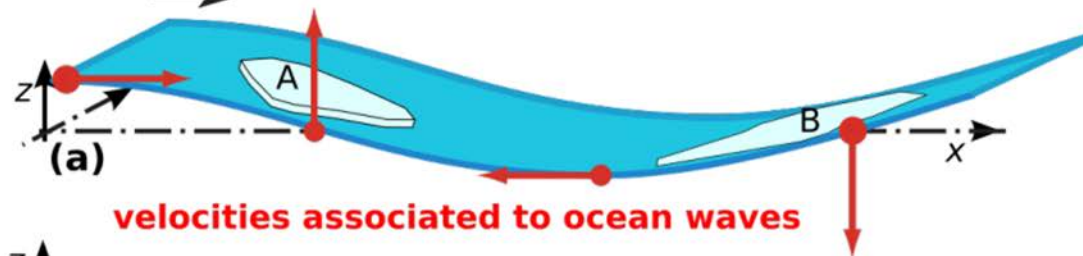
March 23, 2019
Feb 28, March 12, 2021
and January 22, 2022

additional cases
3 March 2021
23 April 2022

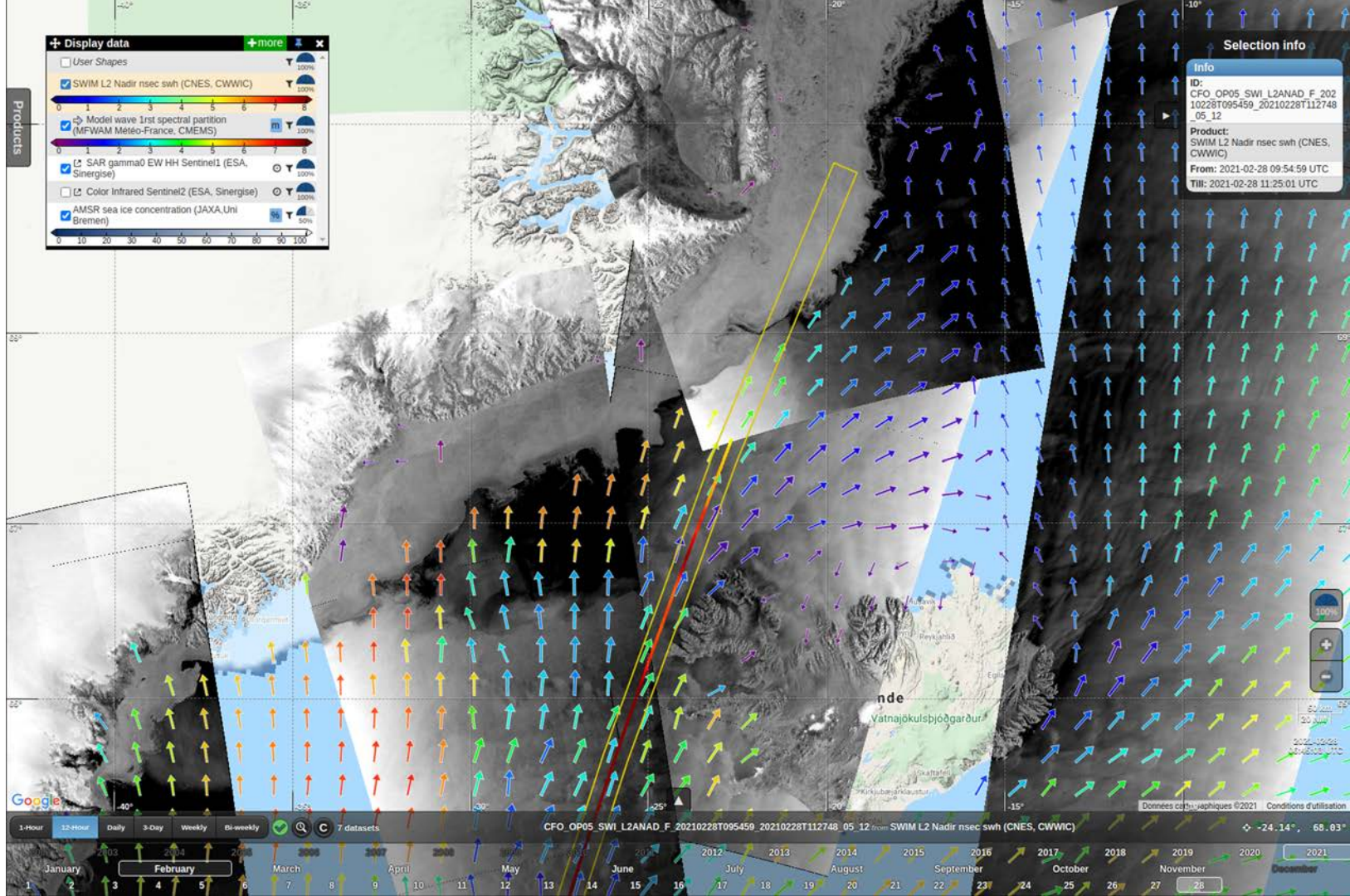


Direction of wave propagation

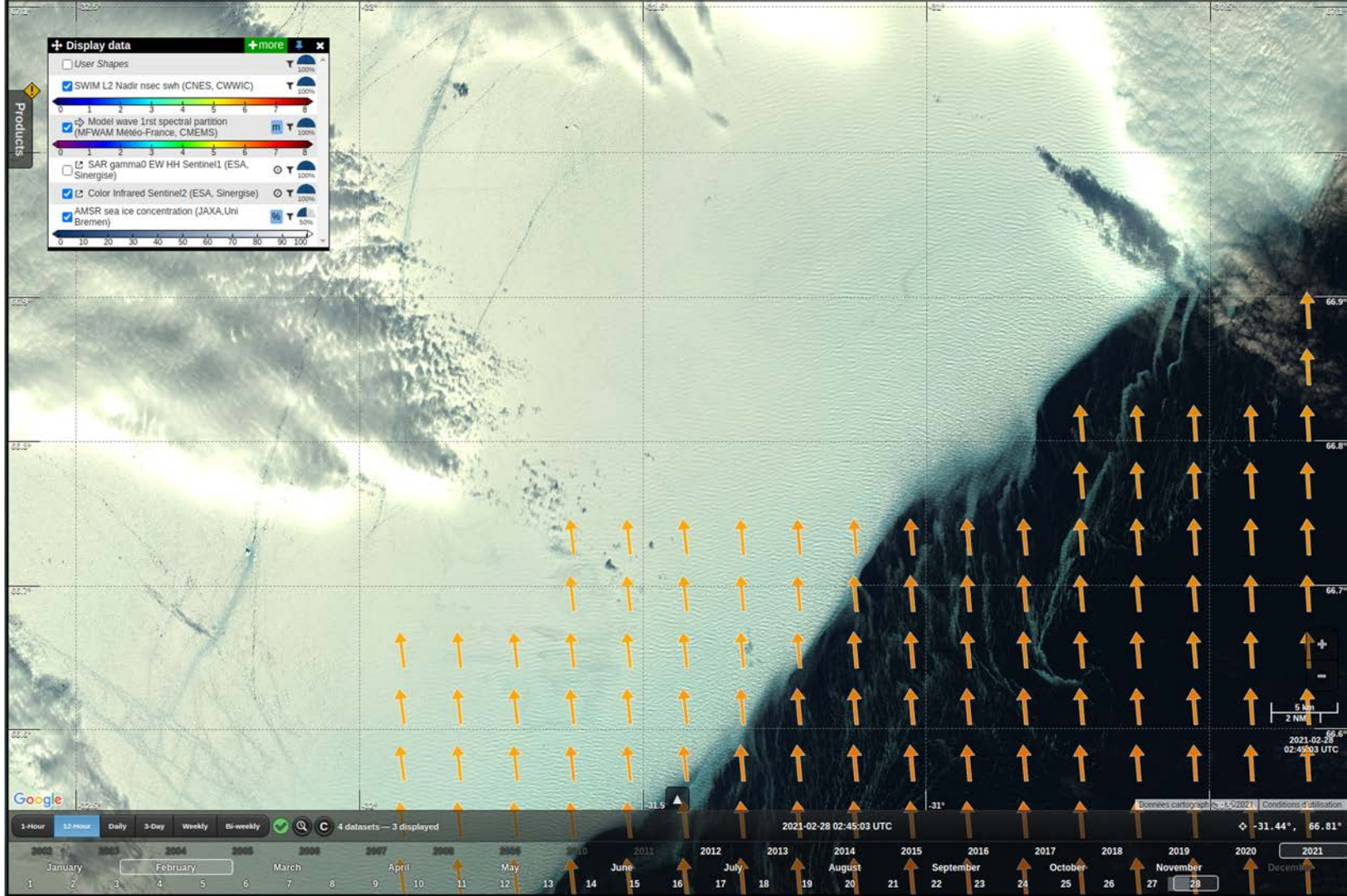
sun



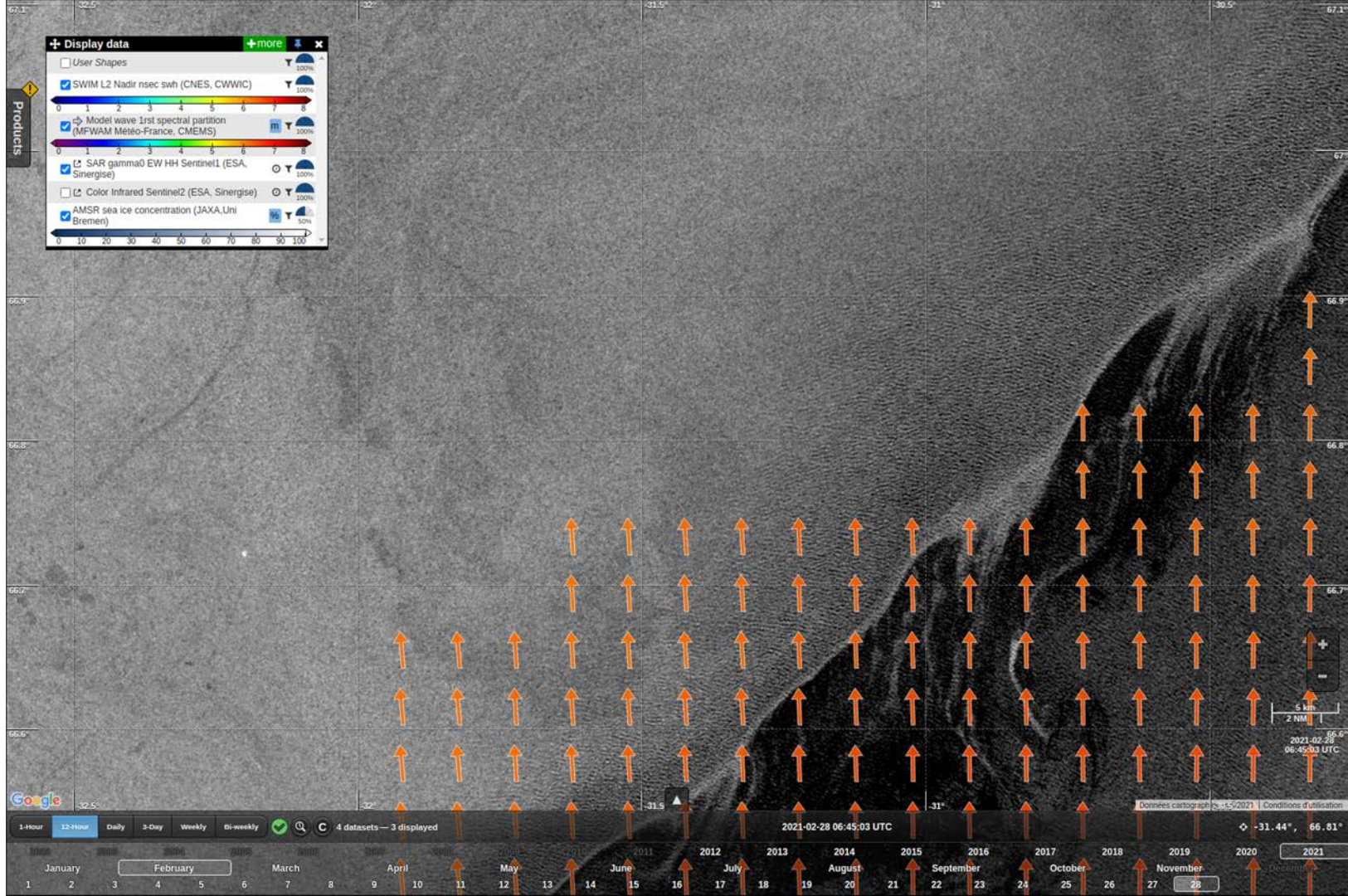
28
fev
2021



28 fev
2021



28
fev
2021



Icesat2

Date: 2021-02-28 ▾

ELEVATION PROFILE

ATL03 PHOTON HEIGHTS

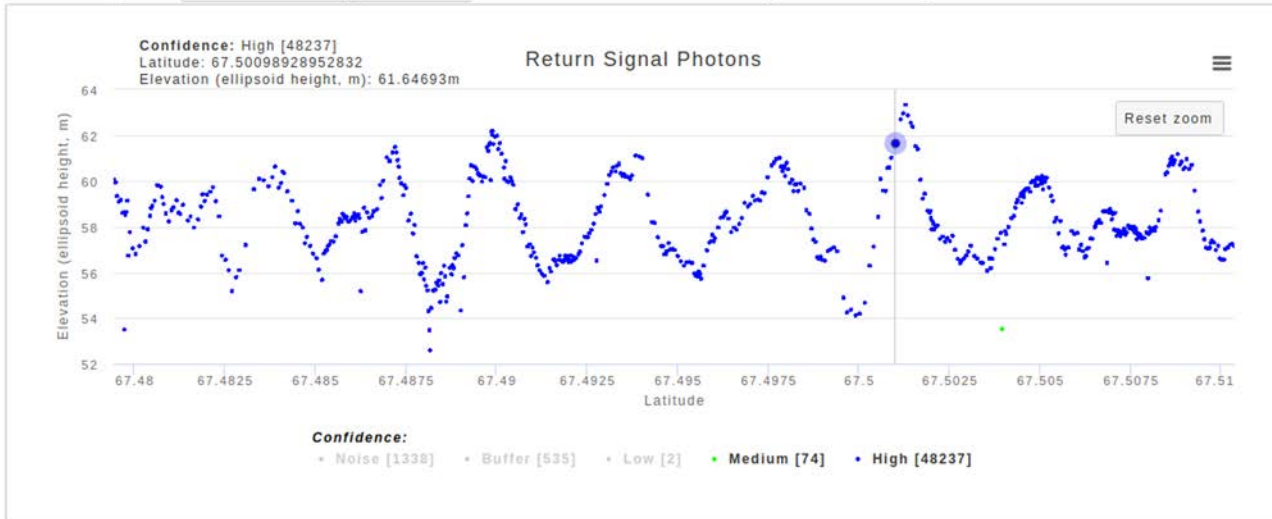
Select ATLAS beam [gt3r \(strong\)](#) | [gt3l \(weak\)](#) | [gt2r \(strong\)](#) | [gt2l \(weak\)](#) | [gt1r \(strong\)](#) | [gt1l \(weak\)](#)

Track ID: 1023 - Beam: gt3r - Showing 5% data sample rate - [View all data \(Requires Login\)](#)

Total number of photons: 1,003,711 - Total segments: 6,441 - Segment range: [373,774 - 380,214]

☐ **Overlay L3A** [ATL06 land ice height](#)

Drag zoom on the plot below to view more detail.

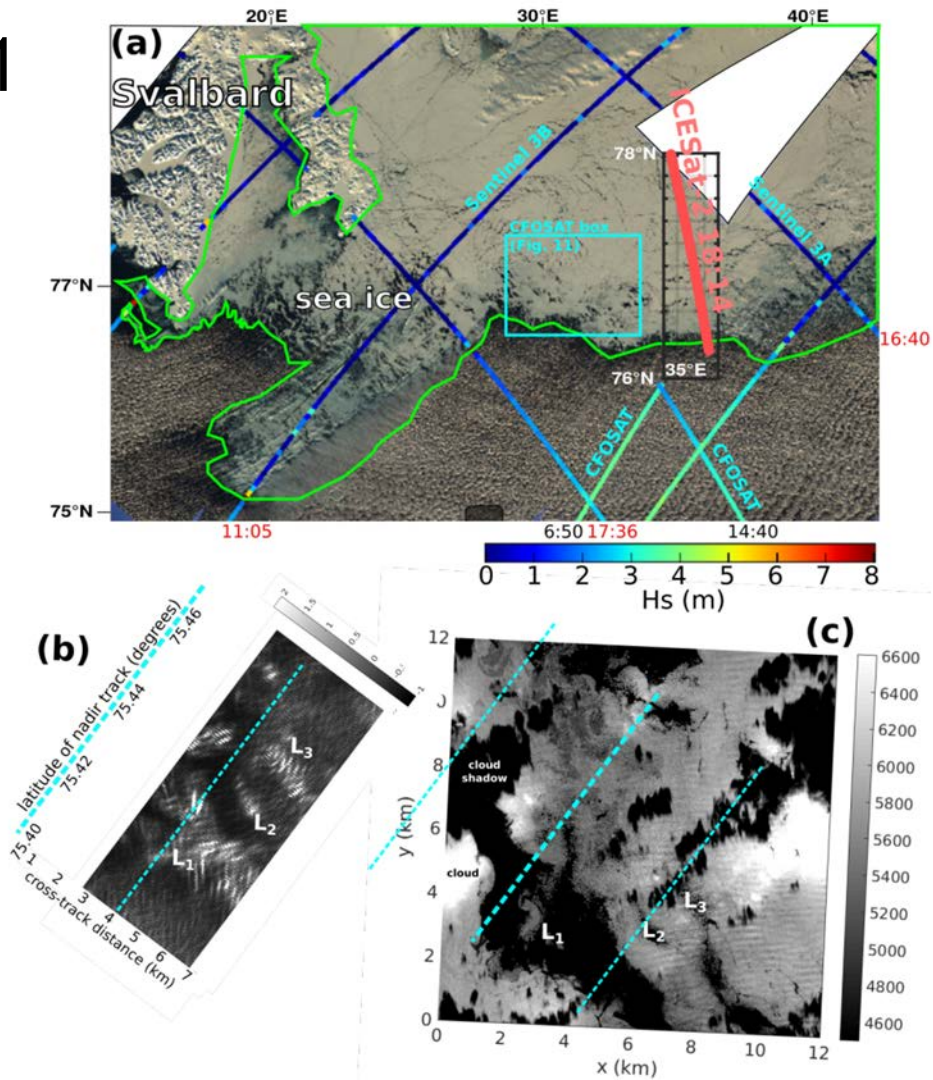


[Download data as CSV](#)

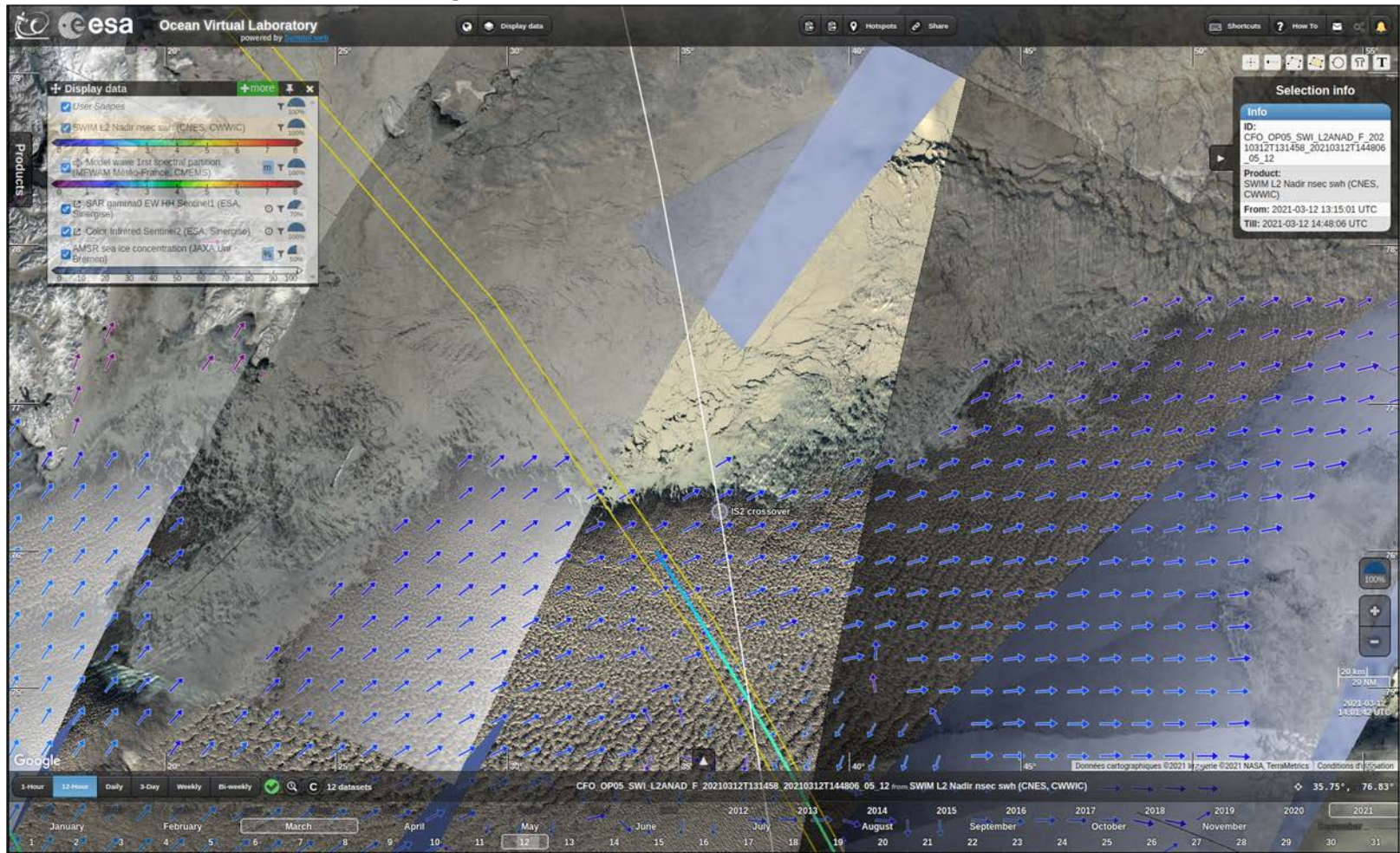
[Download subsetting HDF5 \(via NSIDC\)](#) [\(Requires Login\)](#)

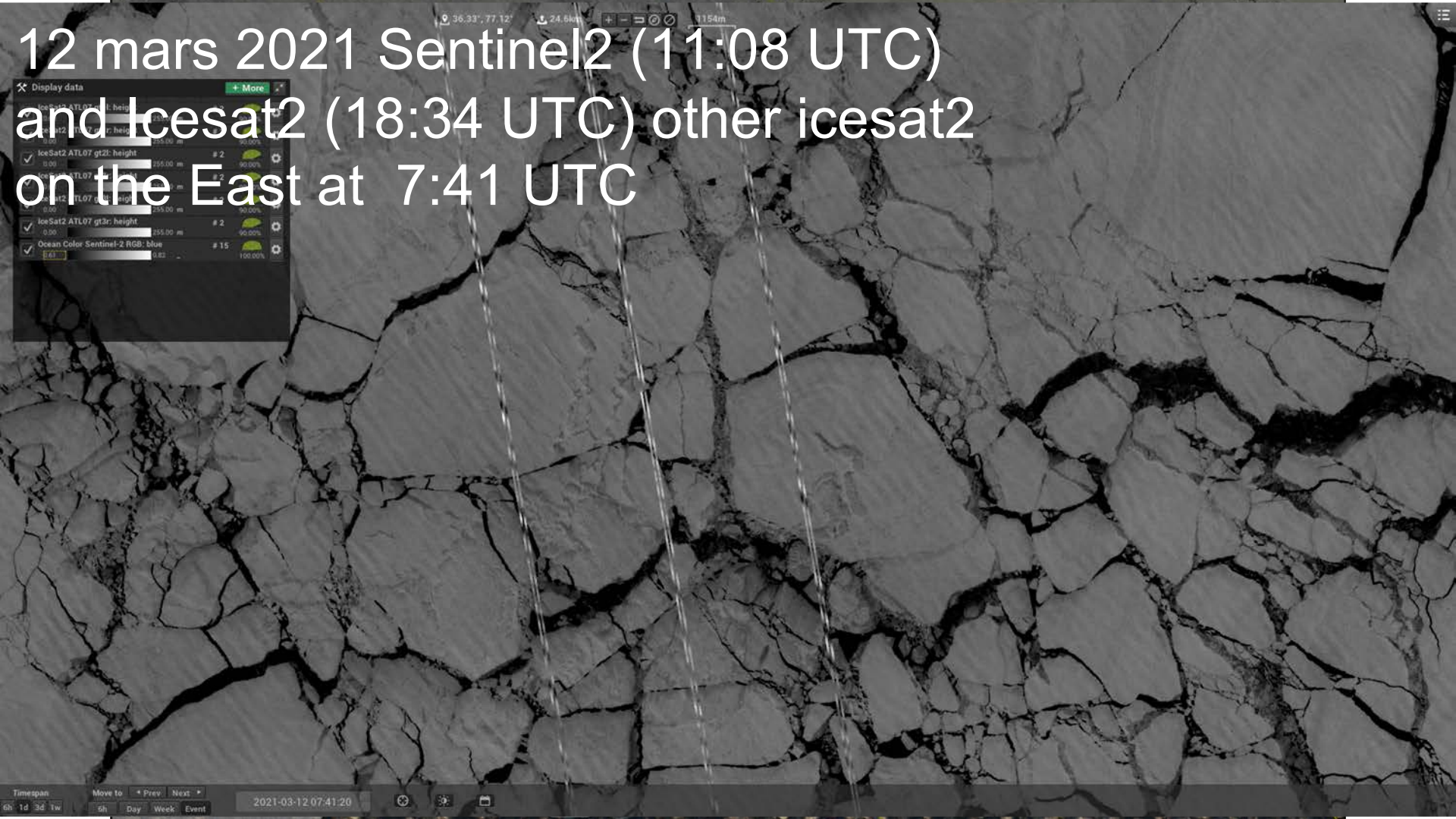
[Get API URL](#) [\(Binder example\)](#) [3D Viewer](#)

12 march 2021



12 march 2021 : <https://odl.bzh/2ndzIGdE>

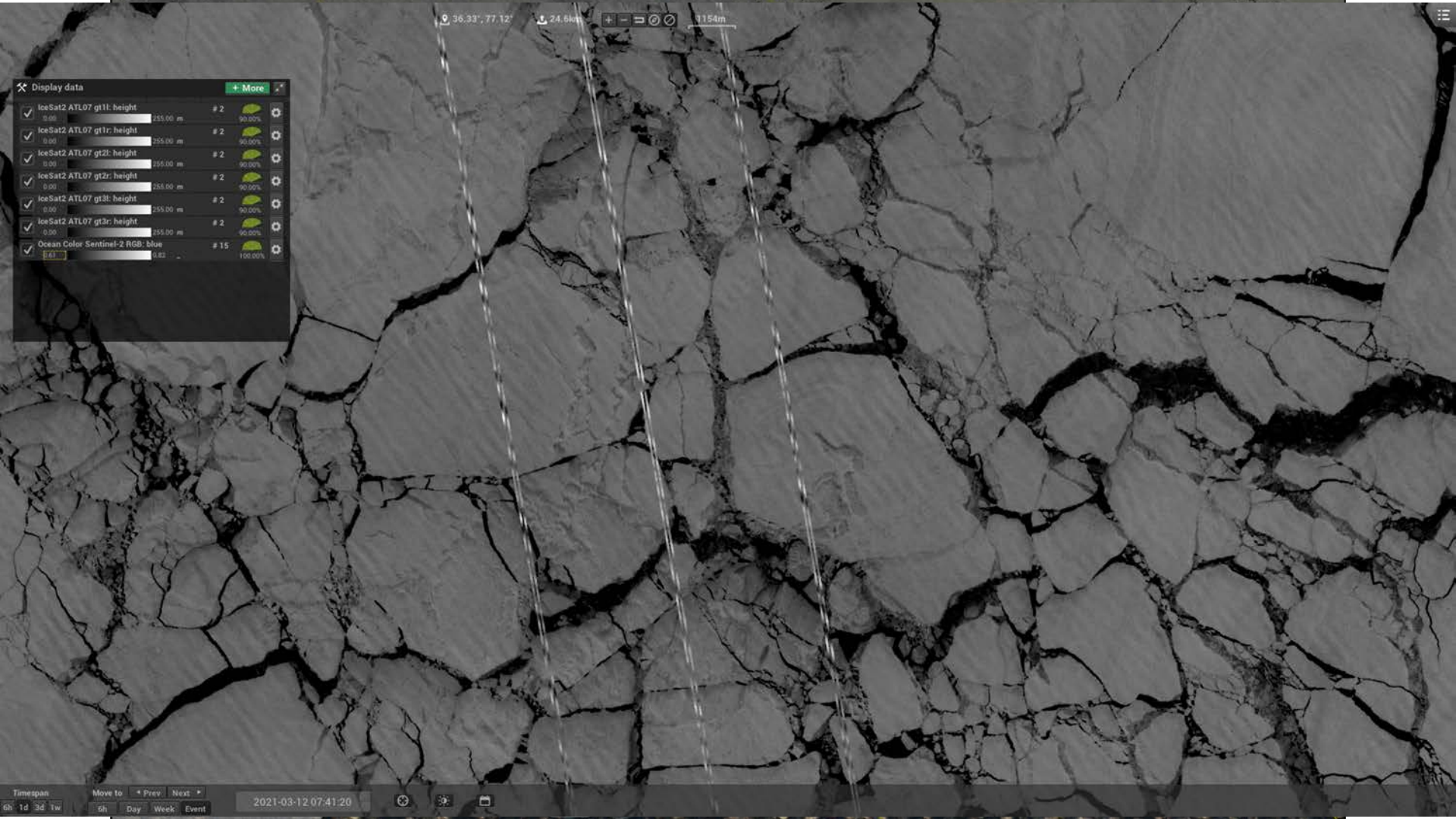




12 mars 2021 Sentinel2 (11:08 UTC)
and Icesat2 (18:34 UTC) other icesat2
on the East at 7:41 UTC

Display data + More

<input checked="" type="checkbox"/>	IceSat2 ATL07 gt2: height	0.00	155.00 m	# 2		
<input checked="" type="checkbox"/>	IceSat2 ATL07 gt2: height	0.00	155.00 m	# 2		
<input checked="" type="checkbox"/>	IceSat2 ATL07 gt2: height	0.00	155.00 m	# 2		
<input checked="" type="checkbox"/>	IceSat2 ATL07 gt2: height	0.00	155.00 m	# 2		
<input checked="" type="checkbox"/>	Ocean Color Sentinel-2 RGB: blue	0.61	0.82	# 15		



Display data + More

<input checked="" type="checkbox"/>	IceSat2 ATL07 gt1l: height	0.00	155.00 m	# 2		90.00%	
<input checked="" type="checkbox"/>	IceSat2 ATL07 gt1r: height	0.00	155.00 m	# 2		90.00%	
<input checked="" type="checkbox"/>	IceSat2 ATL07 gt2l: height	0.00	155.00 m	# 2		90.00%	
<input checked="" type="checkbox"/>	IceSat2 ATL07 gt2r: height	0.00	155.00 m	# 2		90.00%	
<input checked="" type="checkbox"/>	IceSat2 ATL07 gt3l: height	0.00	155.00 m	# 2		90.00%	
<input checked="" type="checkbox"/>	IceSat2 ATL07 gt3r: height	0.00	155.00 m	# 2		90.00%	
<input checked="" type="checkbox"/>	Ocean Color Sentinel-2 RGB: blue	0.61	0.82	# 15		100.00%	

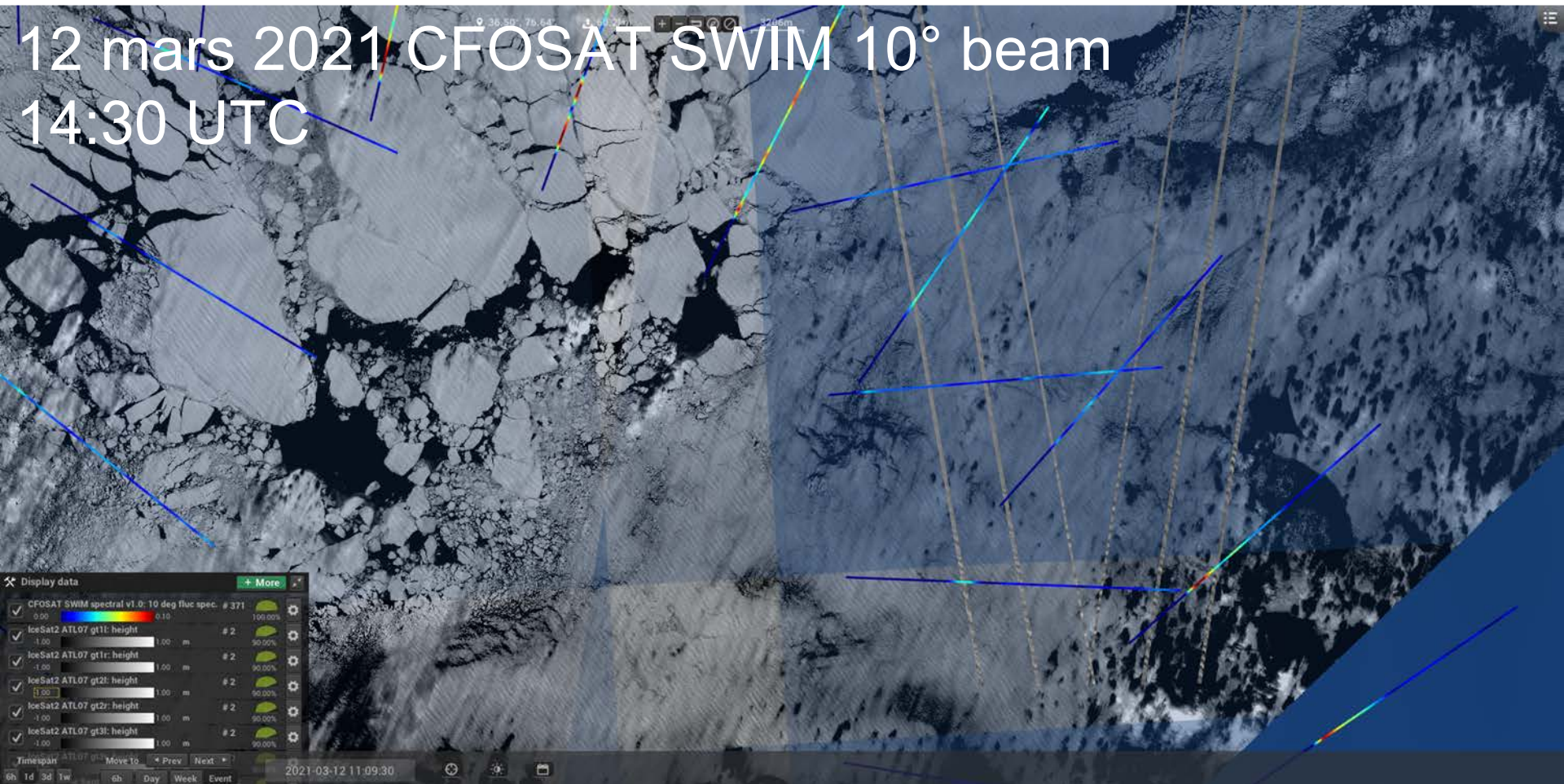
12 mars 2021 CFOSAT SWIM 10° beam
14:30 UTC

Display data + More

- ☒ CFOSAT SWIM spectral v1.0: 10 deg fluc spec. # 371
0.00 0.10 100.00%
- ☒ IceSat2 ATL07 gt1r: height # 2
-1.00 1.00 m 99.00%
- ☒ IceSat2 ATL07 gt1r: height # 2
-1.00 1.00 m 99.00%
- ☒ IceSat2 ATL07 gt2r: height # 2
-1.00 1.00 m 99.00%
- ☒ IceSat2 ATL07 gt2r: height # 2
-1.00 1.00 m 99.00%
- ☒ IceSat2 ATL07 gt3r: height # 2
-1.00 1.00 m 99.00%

Timespan Move to Prev Next
6h 1d 3d 1w 2021-03-12 11:09:30 6h Day Week Event

12 mars 2021 CFOSAT SWIM 10° beam
14:30 UTC



12 mars 2021 CFOSAT SWIM 8° beam

Display data + More

<input checked="" type="checkbox"/>	CFOSAT SWIM spectral v1.0: 08 deg flux spec. # 400		
<input checked="" type="checkbox"/>	IceSat2 ATL07 gt1l: height		
<input checked="" type="checkbox"/>	IceSat2 ATL07 gt1r: height		
<input checked="" type="checkbox"/>	IceSat2 ATL07 gt2l: height		
<input checked="" type="checkbox"/>	IceSat2 ATL07 gt2r: height		
<input checked="" type="checkbox"/>	IceSat2 ATL07 gt3l: height		
<input checked="" type="checkbox"/>	IceSat2 ATL07 gt3r: height		
<input checked="" type="checkbox"/>	Ocean Color Sentinel-2 RGB: red		

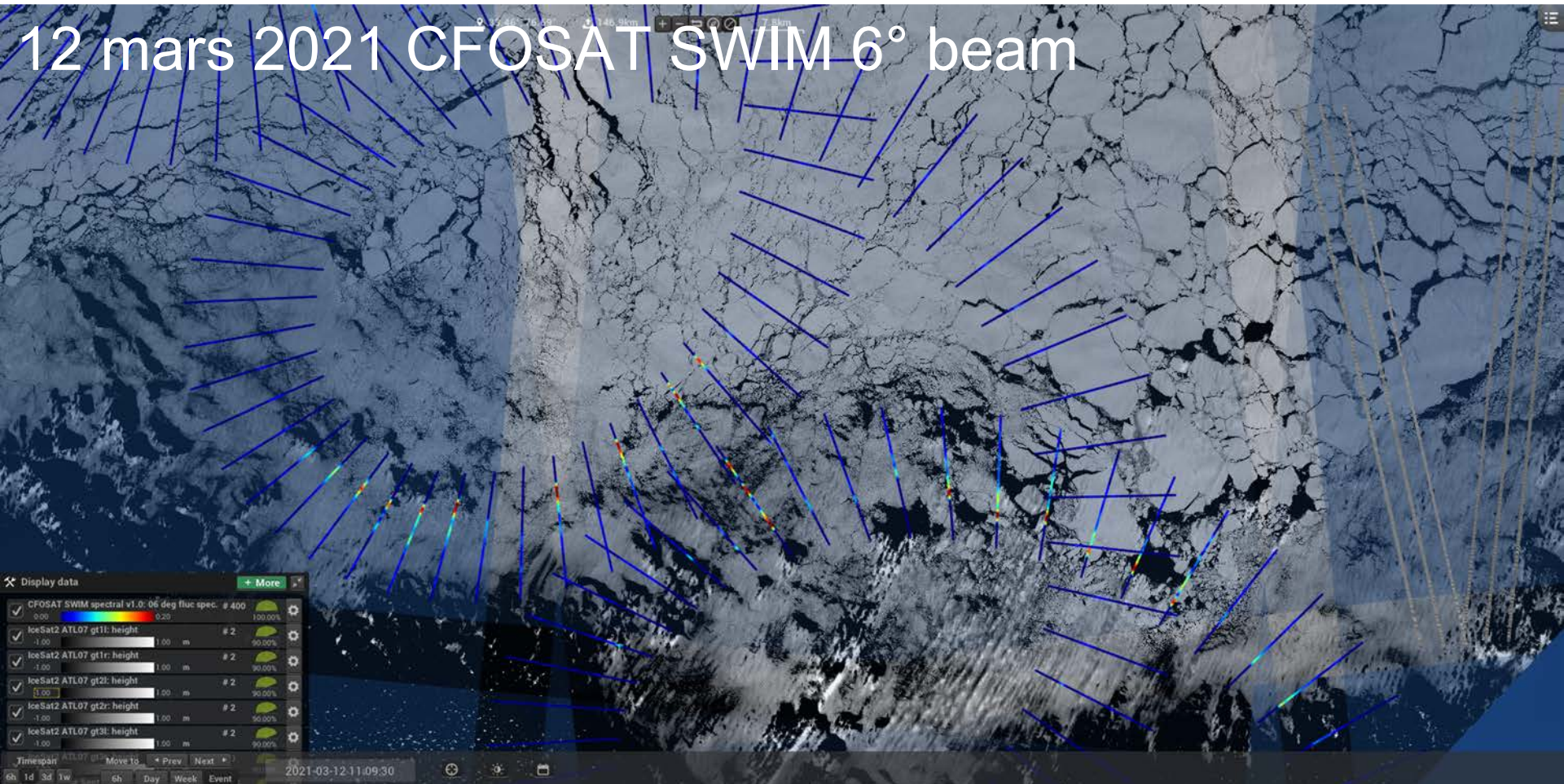
Timespan
6h 1d 3d 1w

Move to
* Prev Next *

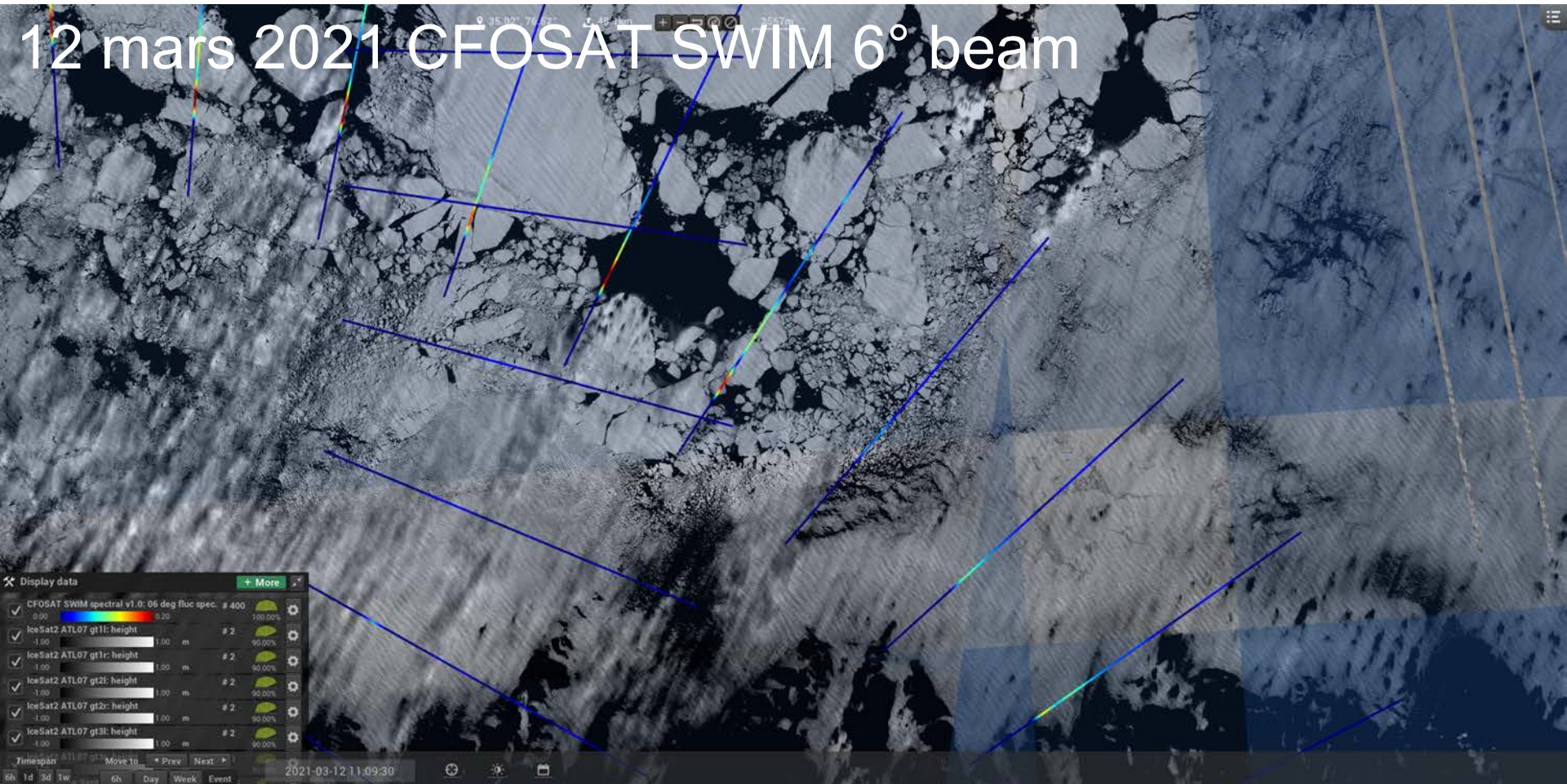
2021-03-12 11:09:30



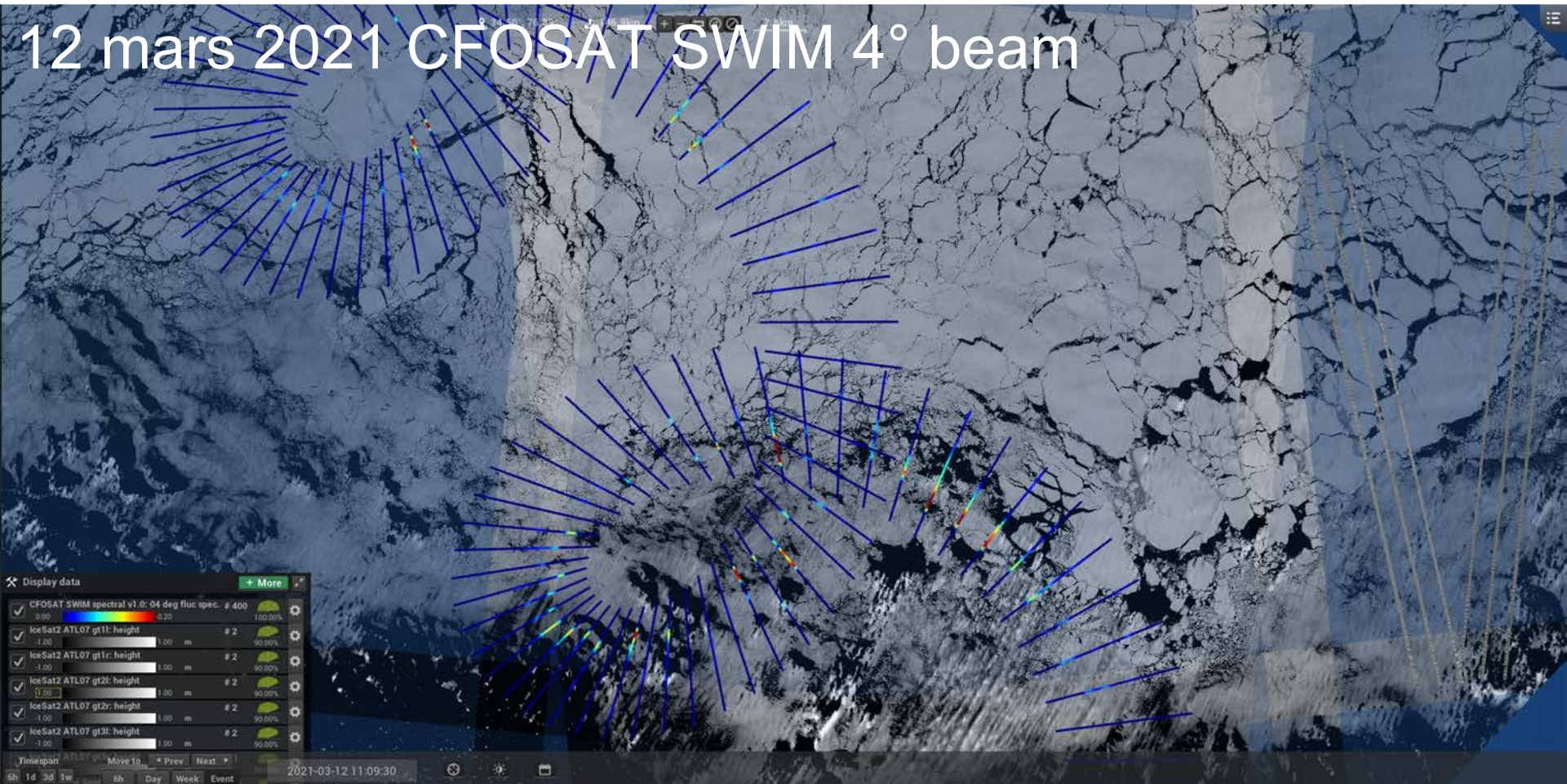
12 mars 2021 CFOSAT SWIM 6° beam



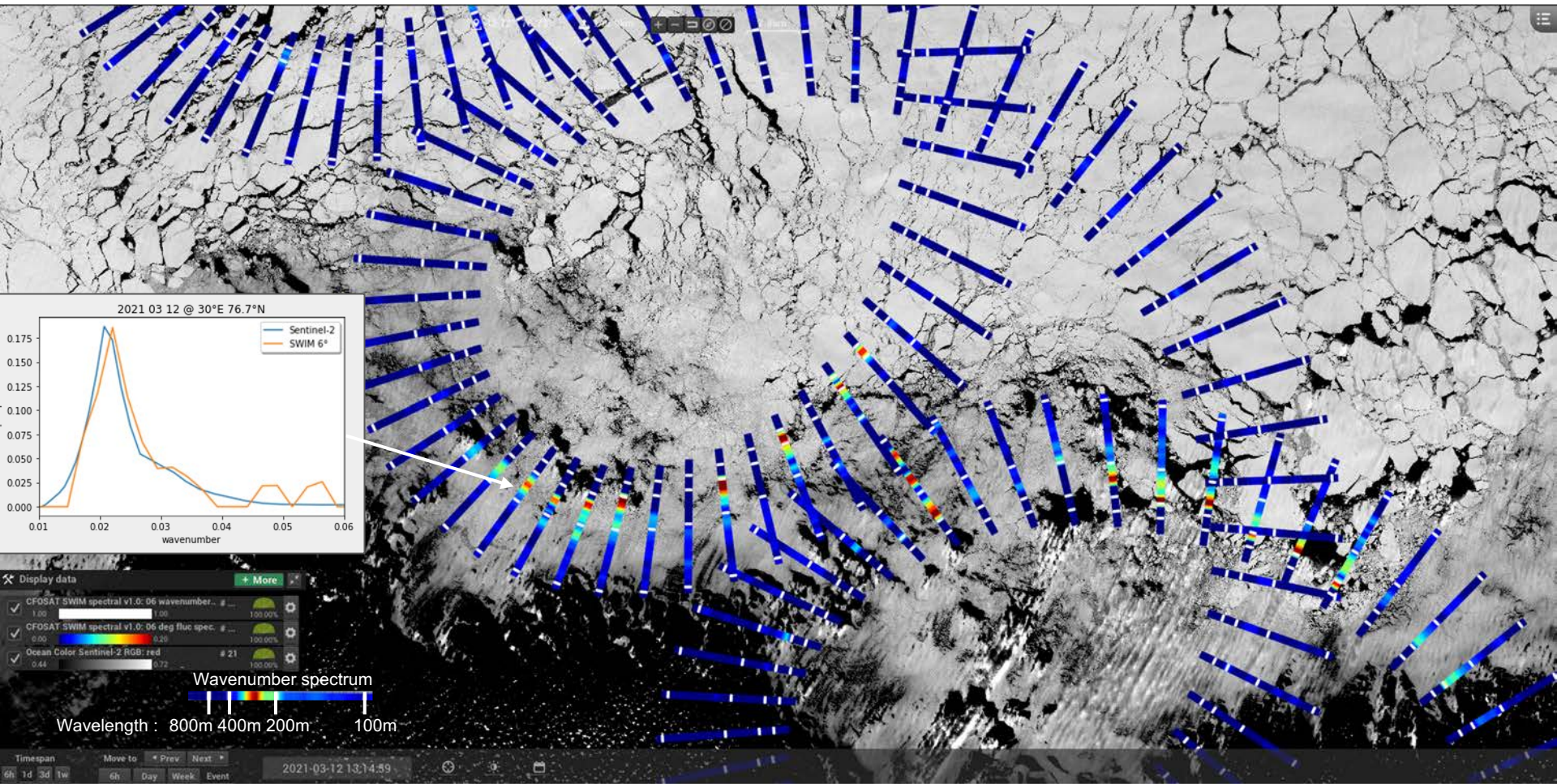
12 mars 2021 CFOSAT SWIM 6° beam



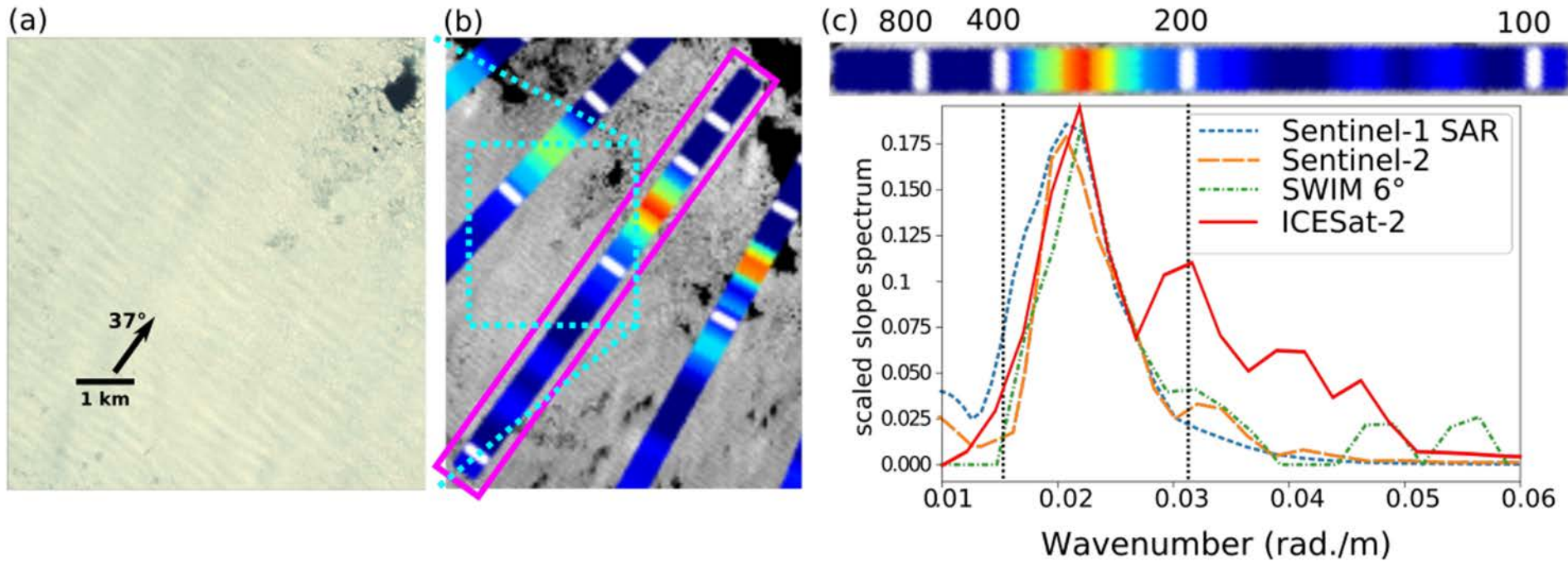
12 mars 2021 CFOSAT SWIM 4° beam

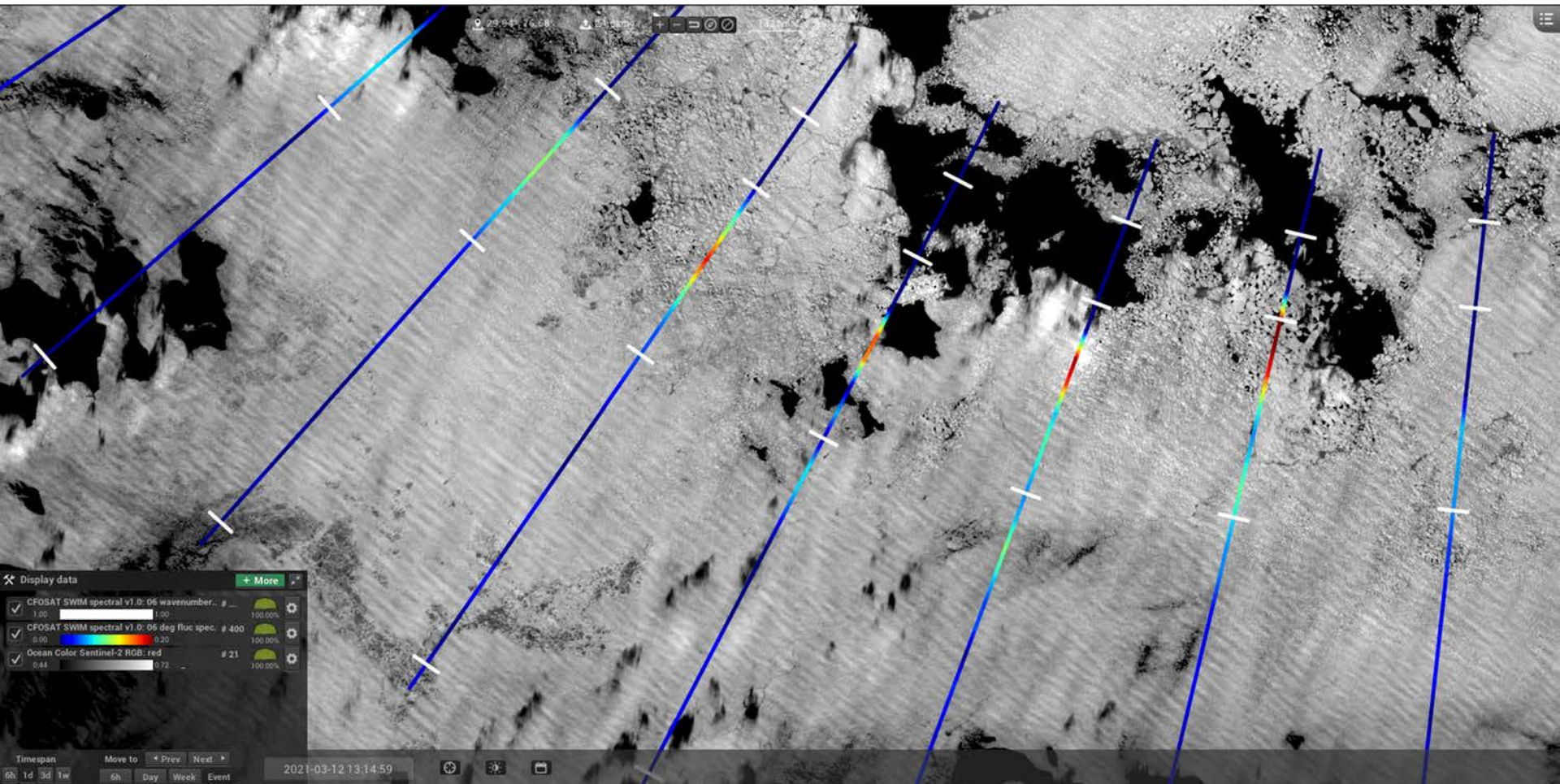


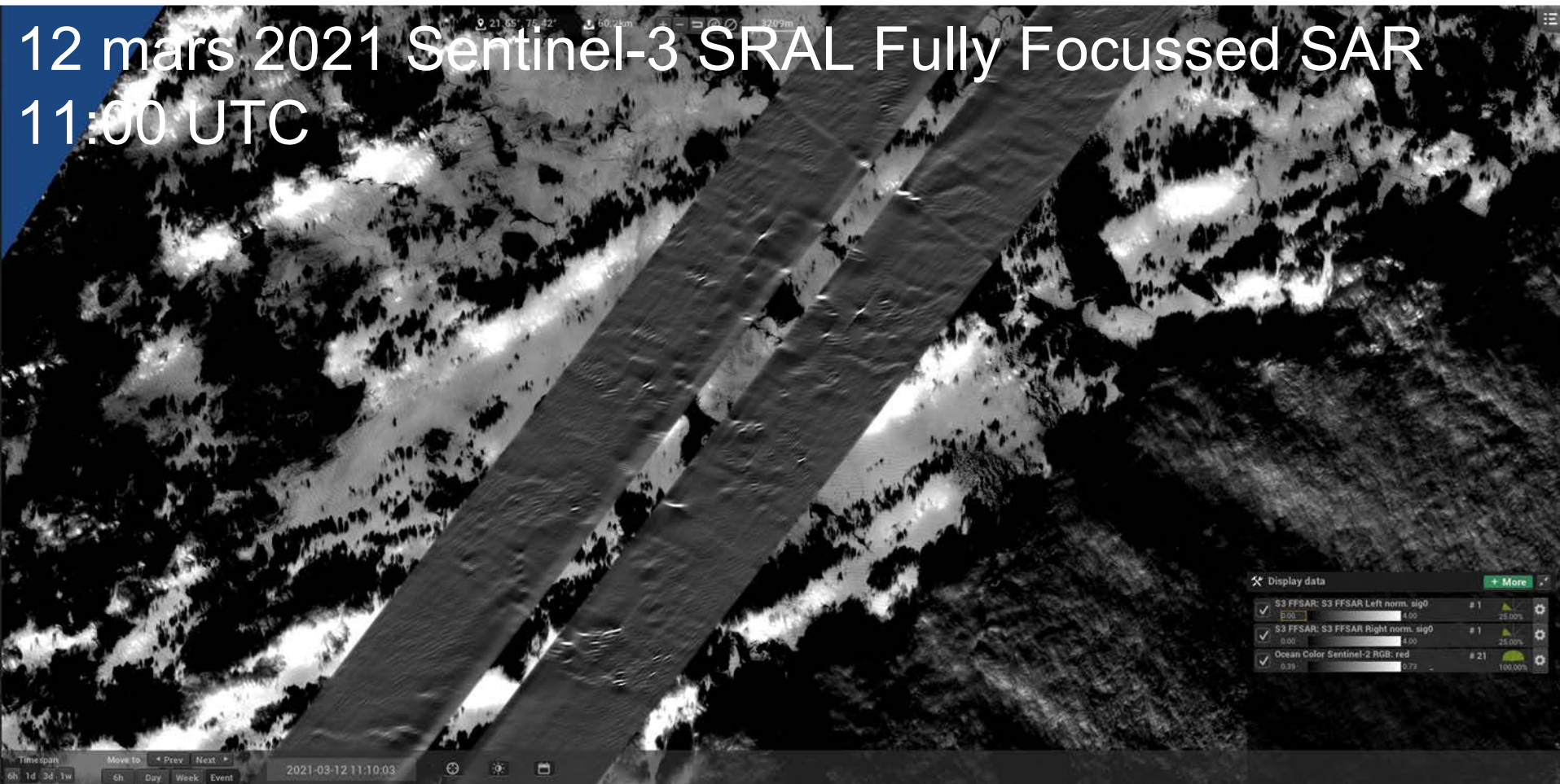
12 mars 2021 CFOSAT SWIM 6° beam over Sentinel-2

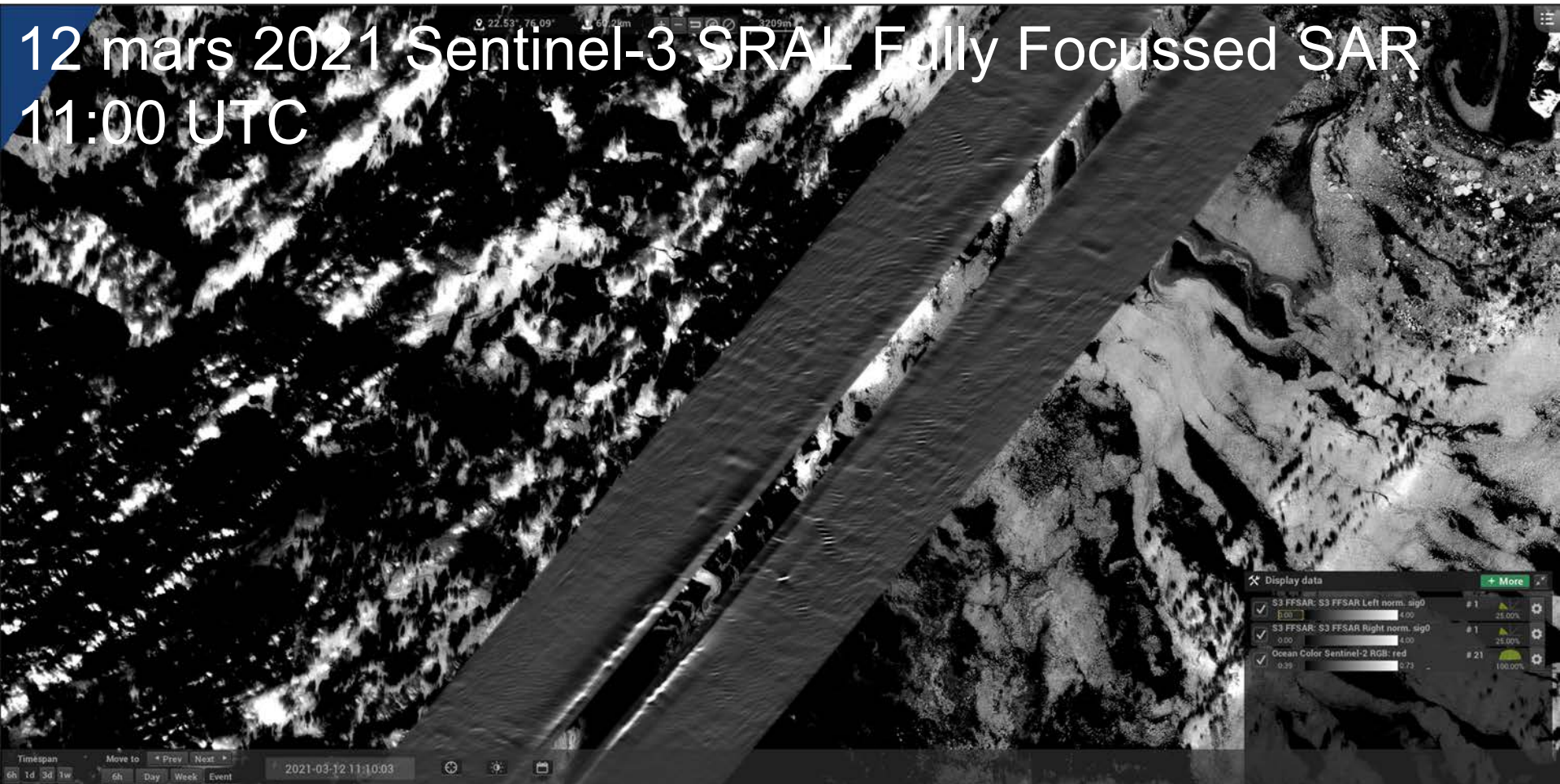


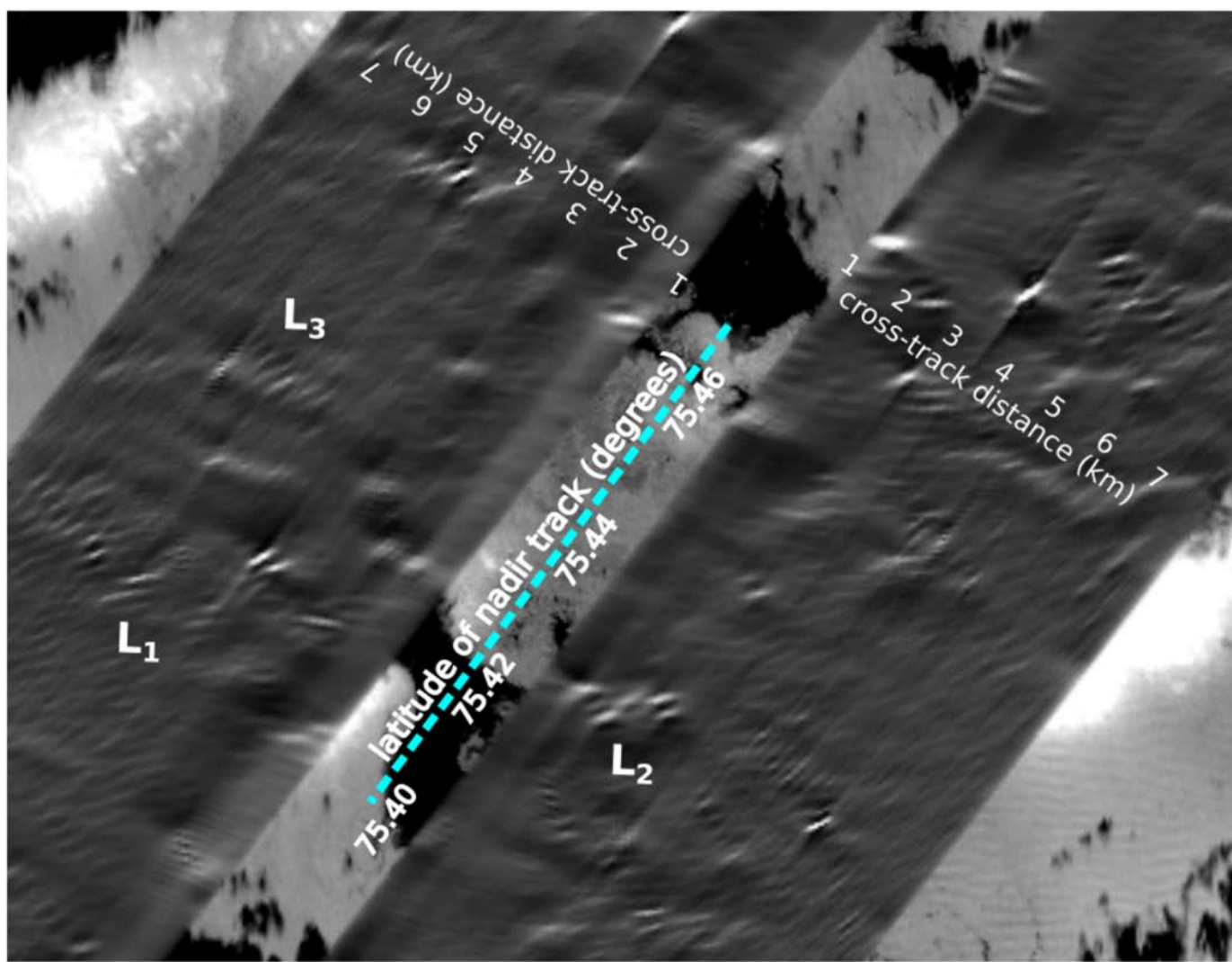
Wave slope spectra intercomparison

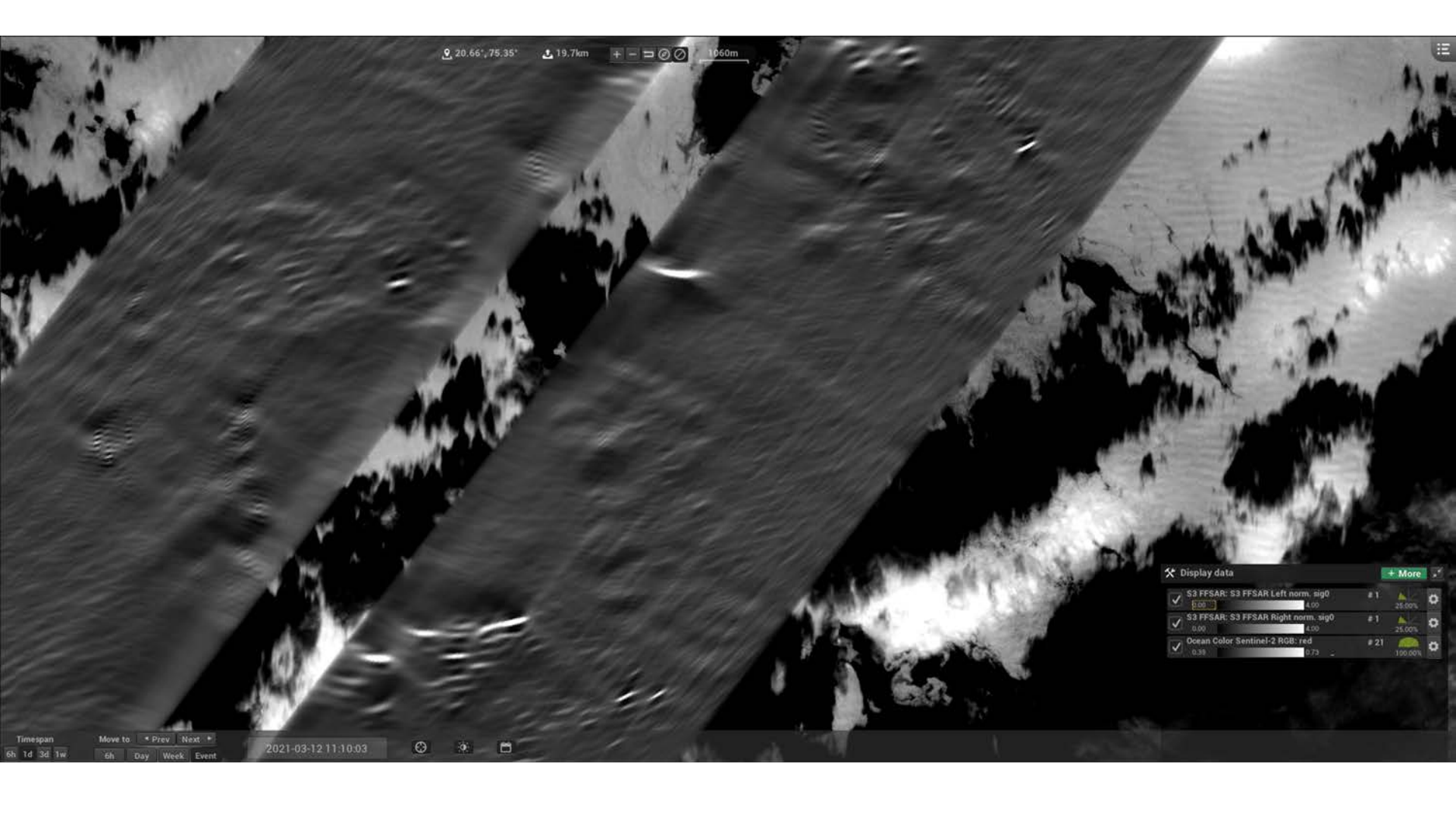












20.66°, 75.35°

19.7km

+ - [icon] [icon]

1060m

Display data

+ More

<input checked="" type="checkbox"/>	S3 FFSAR: S3 FFSAR Left norm. sig0	# 1	<div><div></div></div>	4.00	25.00%	[icon]
<input checked="" type="checkbox"/>	S3 FFSAR: S3 FFSAR Right norm. sig0	# 1	<div><div></div></div>	4.00	25.00%	[icon]
<input checked="" type="checkbox"/>	Ocean Color Sentinel-2 RGB: red	# 21	<div><div></div></div>	0.73	100.00%	[icon]

Timespan
6h 1d 3d 1w

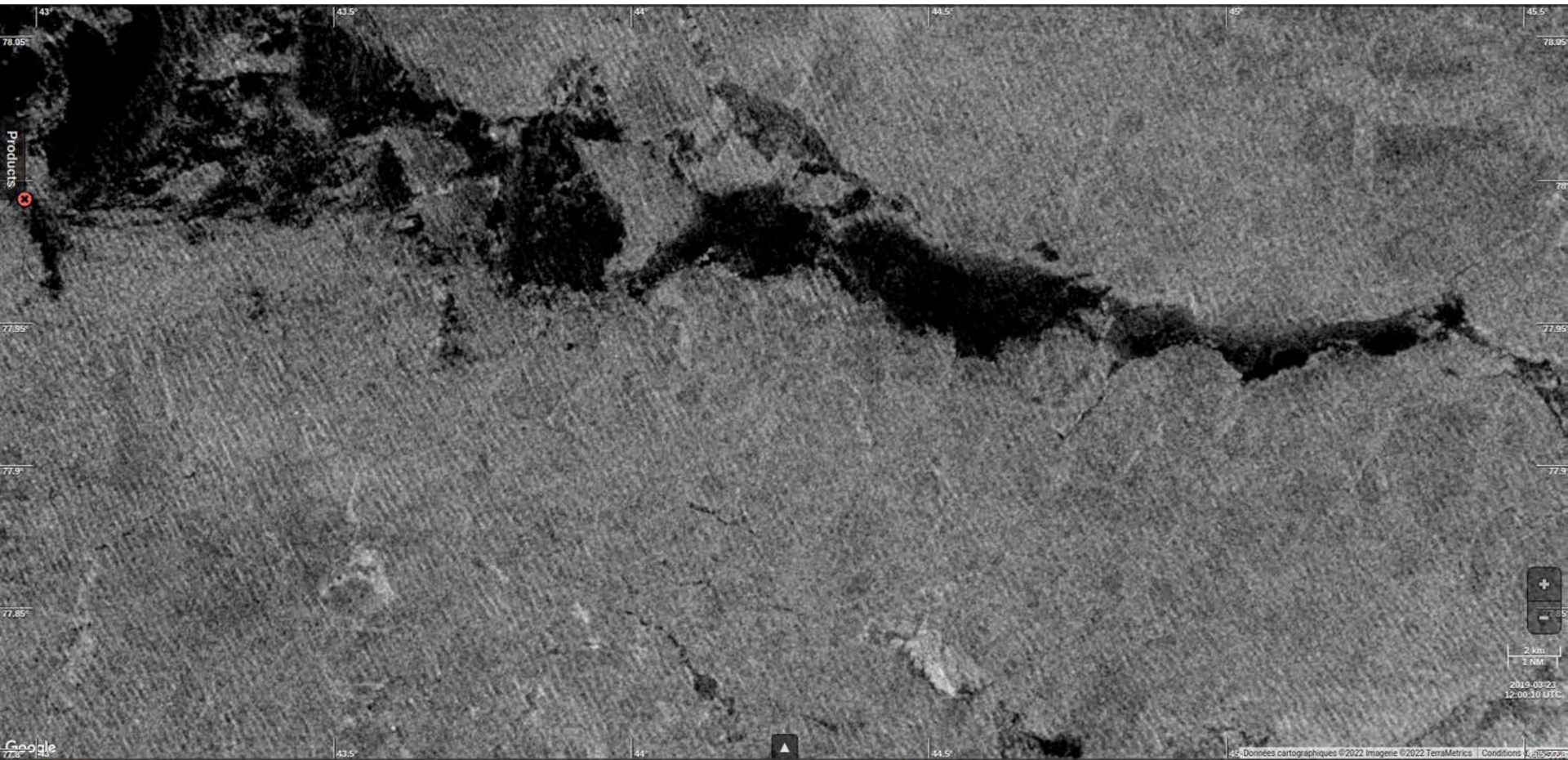
Move to
6h Day Week Event

2021-03-12 11:10:03

[icon] [icon] [icon]

23 March 2019 : <https://odl.bzh/x1ykcJiD>



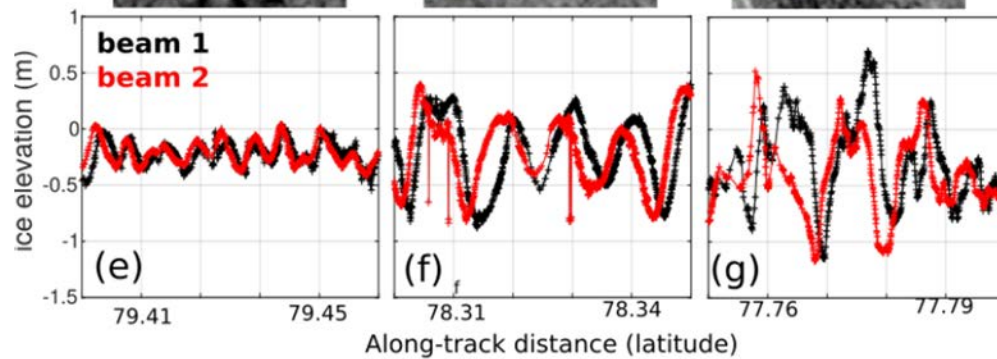
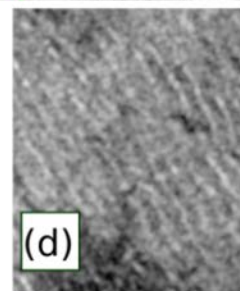
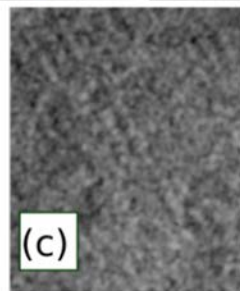
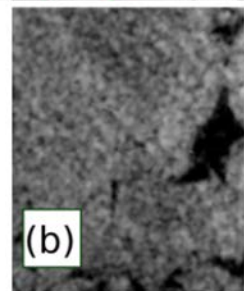
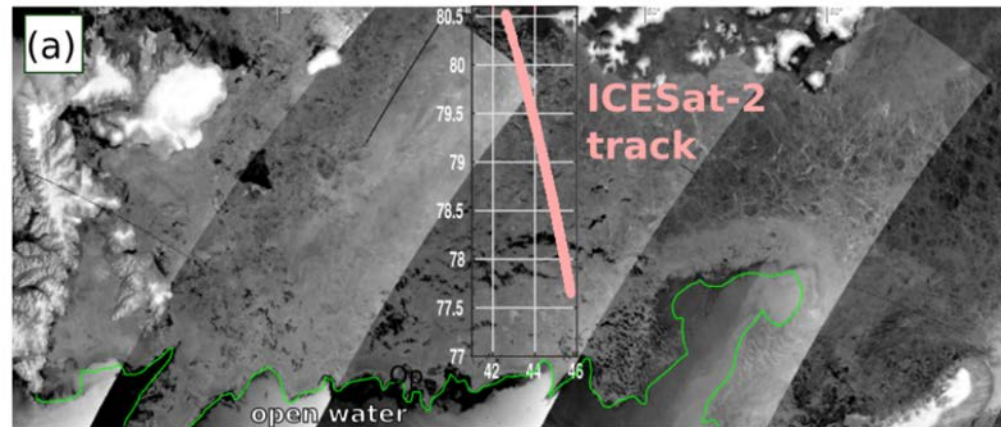


Google

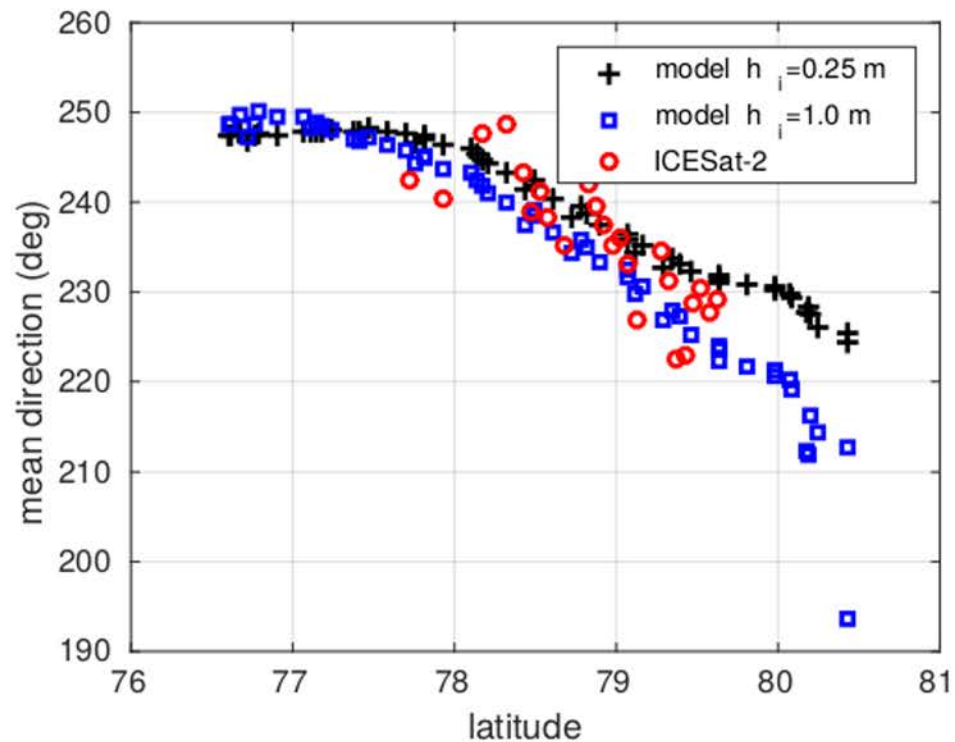
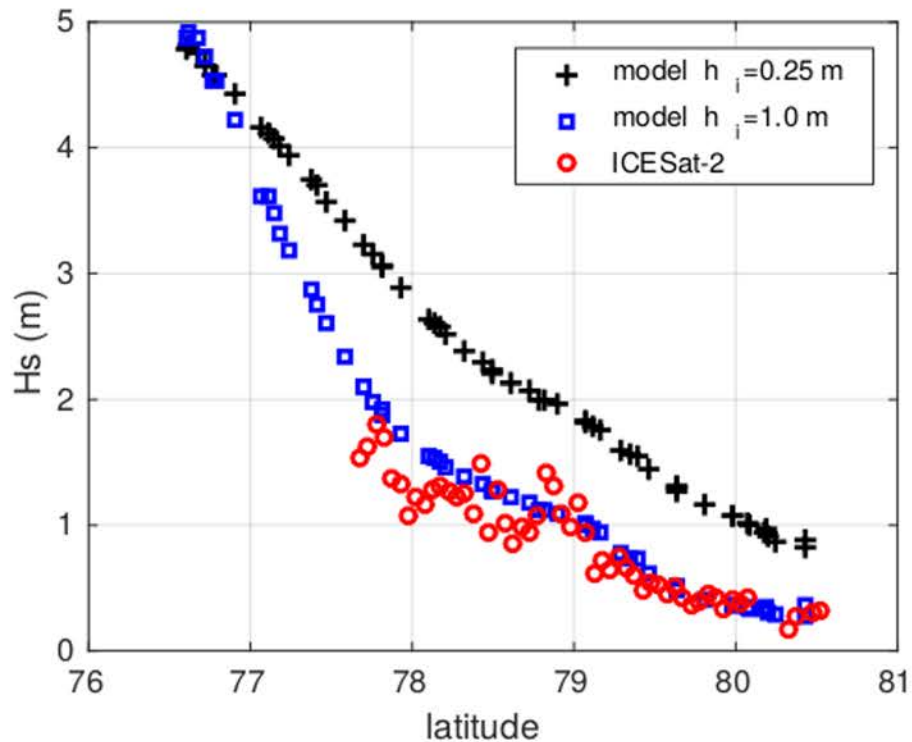
1-Hour 12-Hour Daily 3-Day Weekly Bi-weekly 4 datasets

2019-03-23 12:00:10 UTC

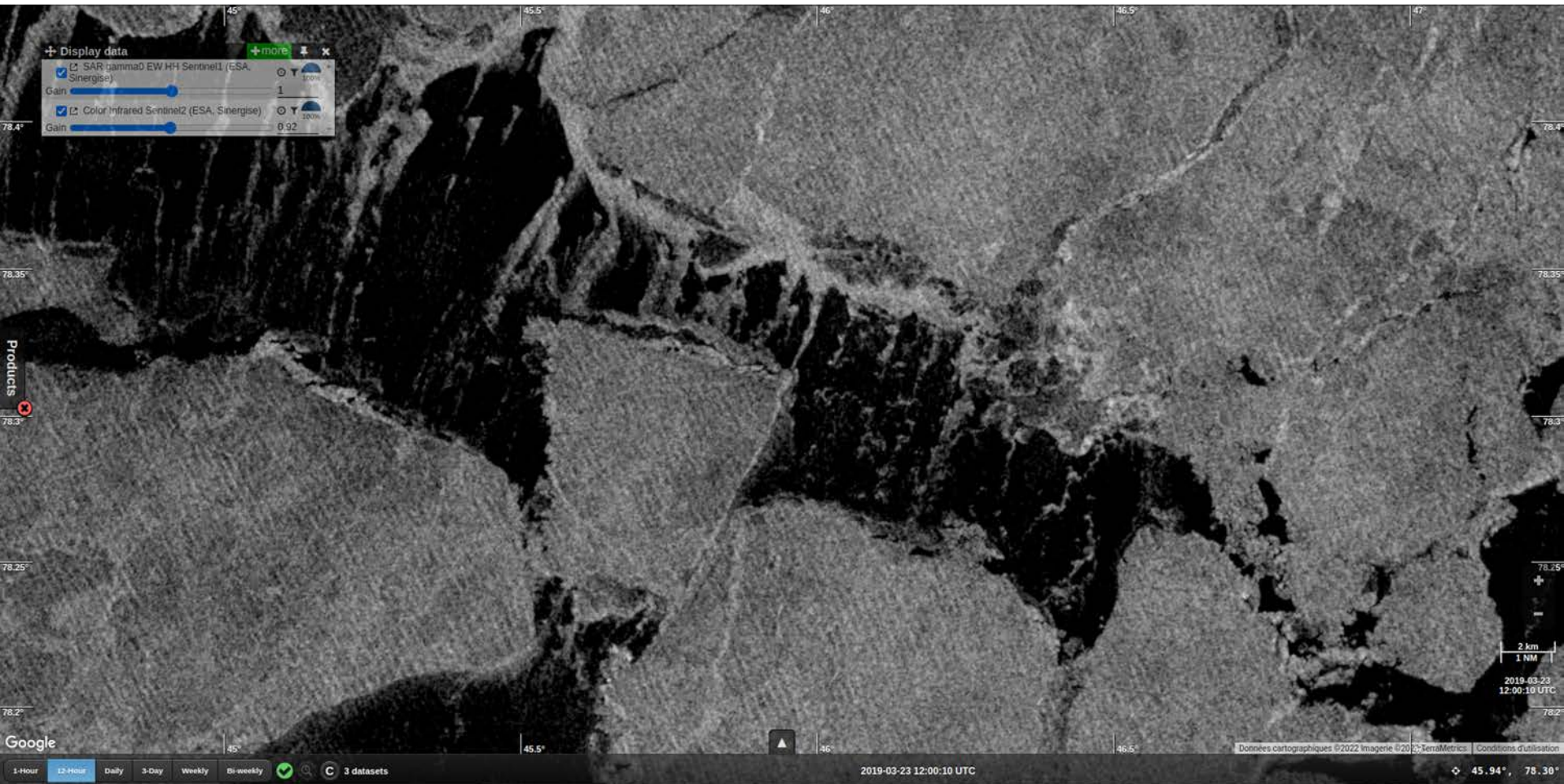
44.26° 77.92°



Wave attenuation in Sea Ice



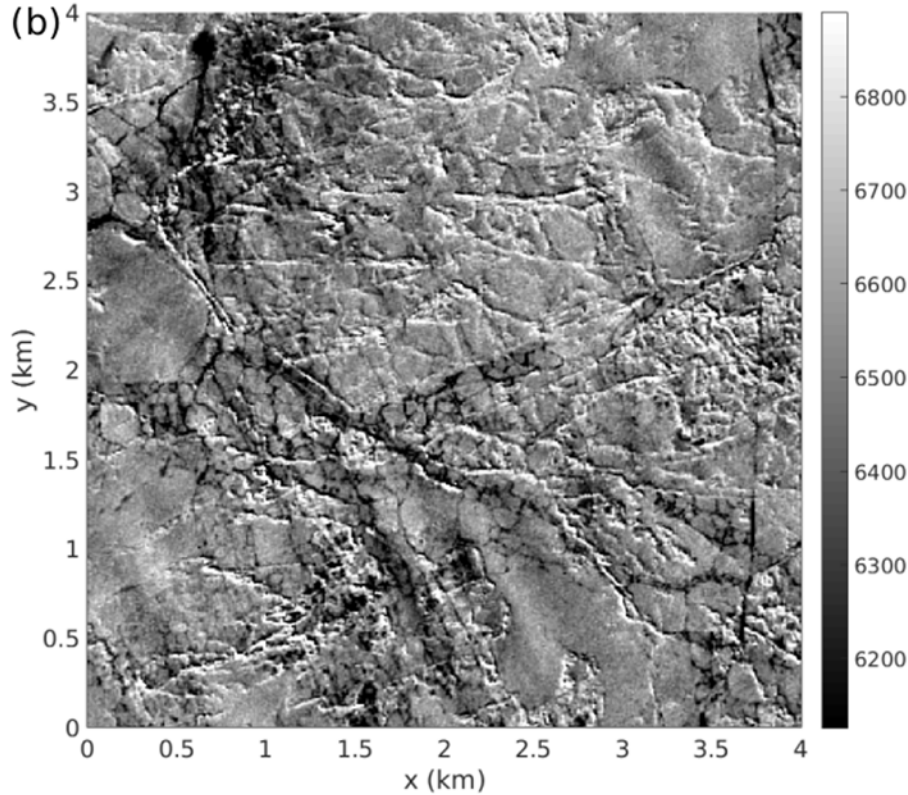
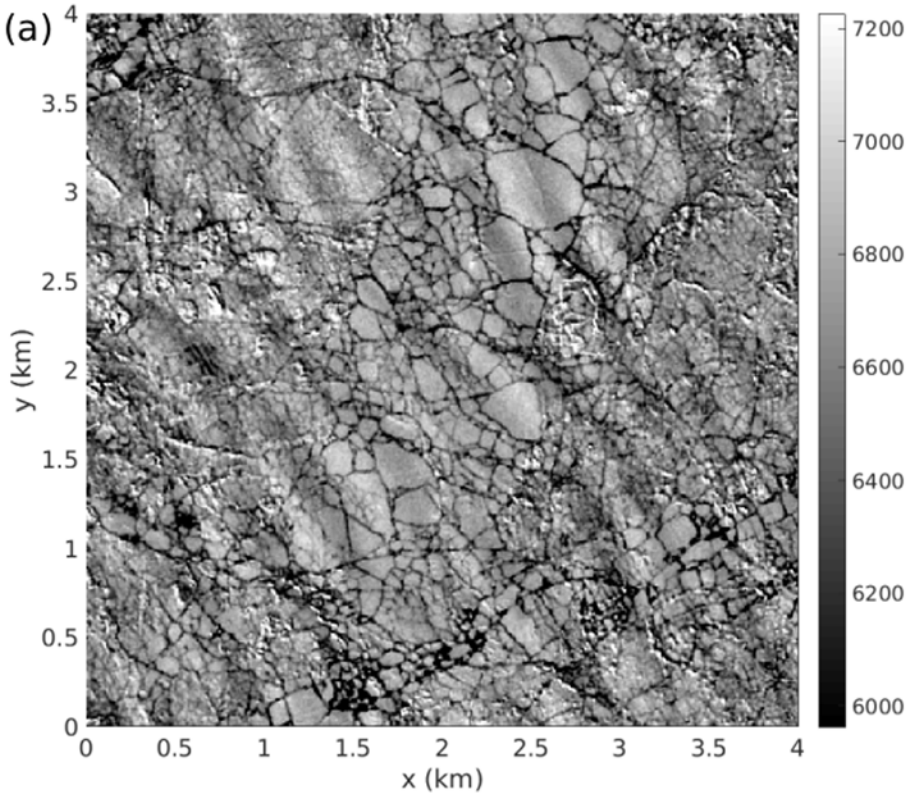
Sentinel 1 at 9:00 UTC



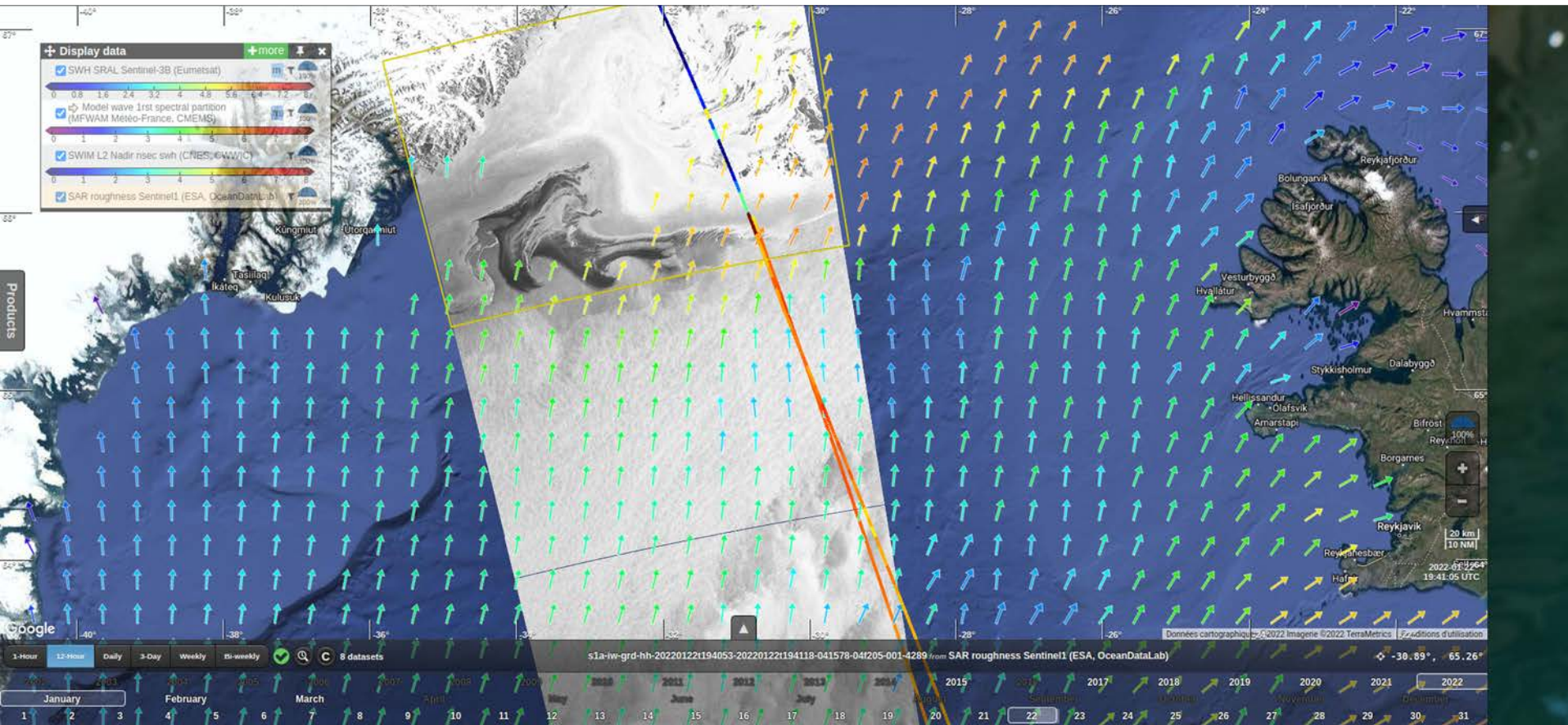
Sentinel 2 at 11:07 UTC

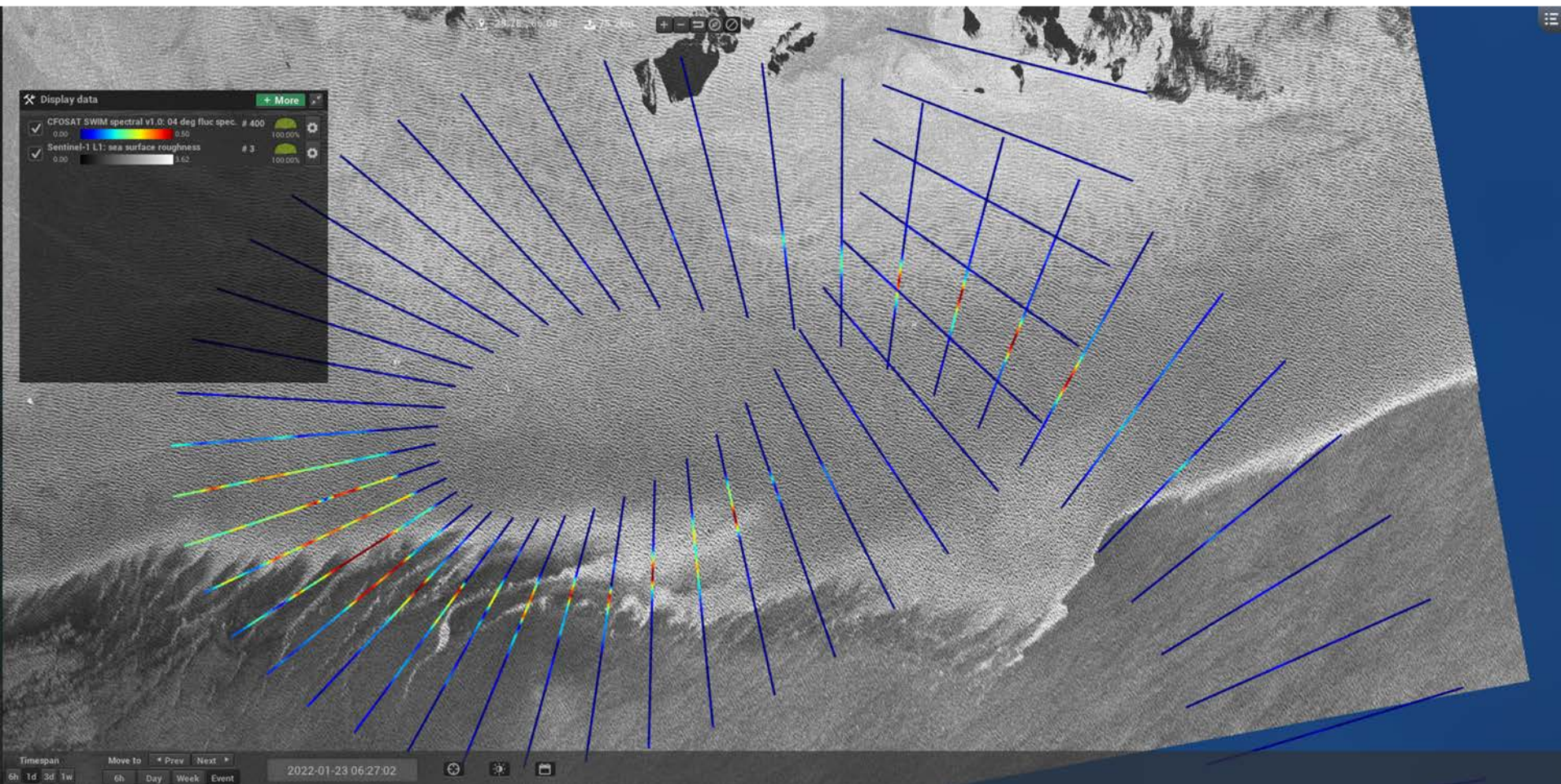


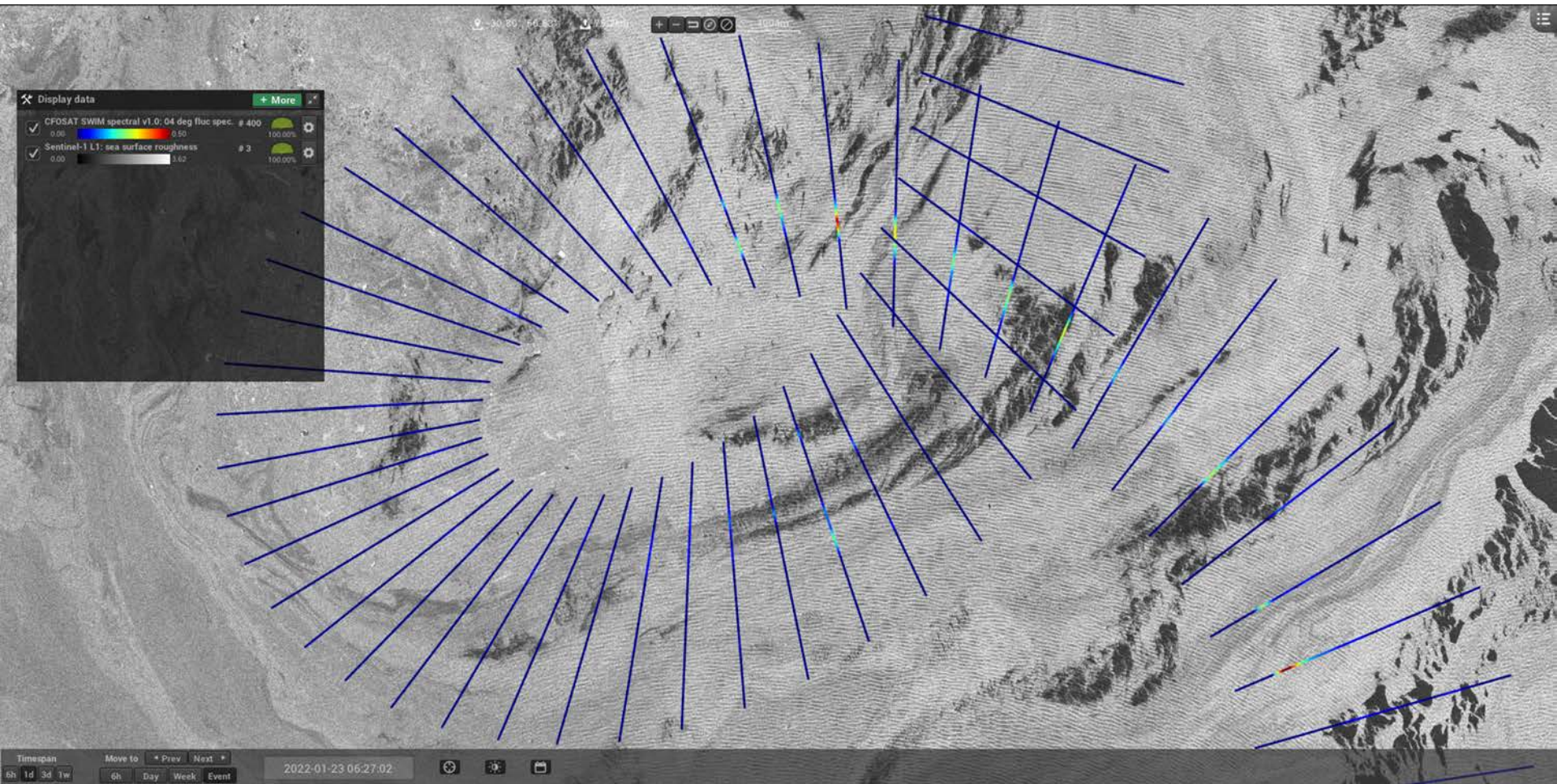
wave patterns in sea ice at 11:07
UTC on 23 March 2019

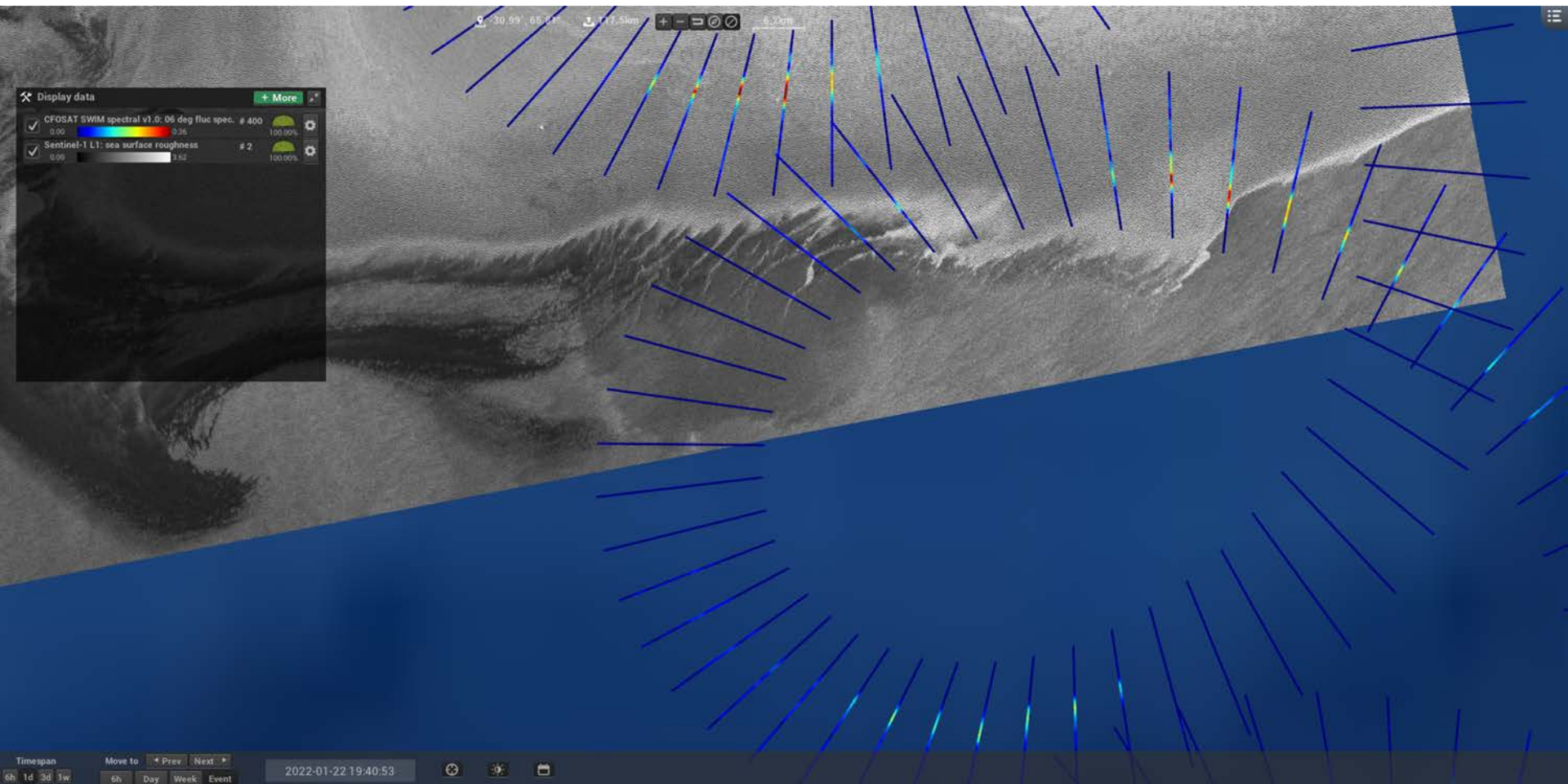


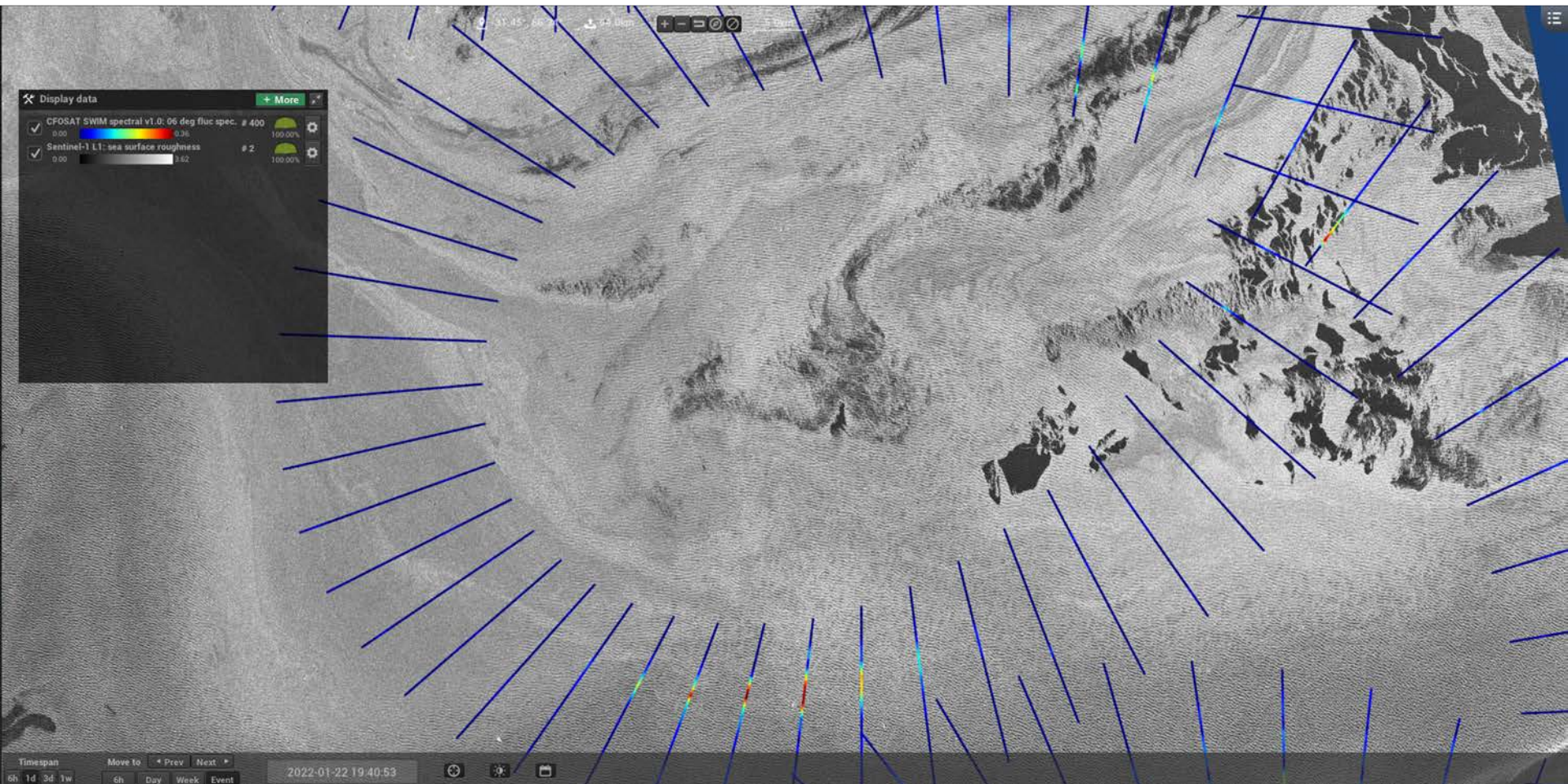
22 January 2022 : <https://odl.bzh/0n4zeCbd>

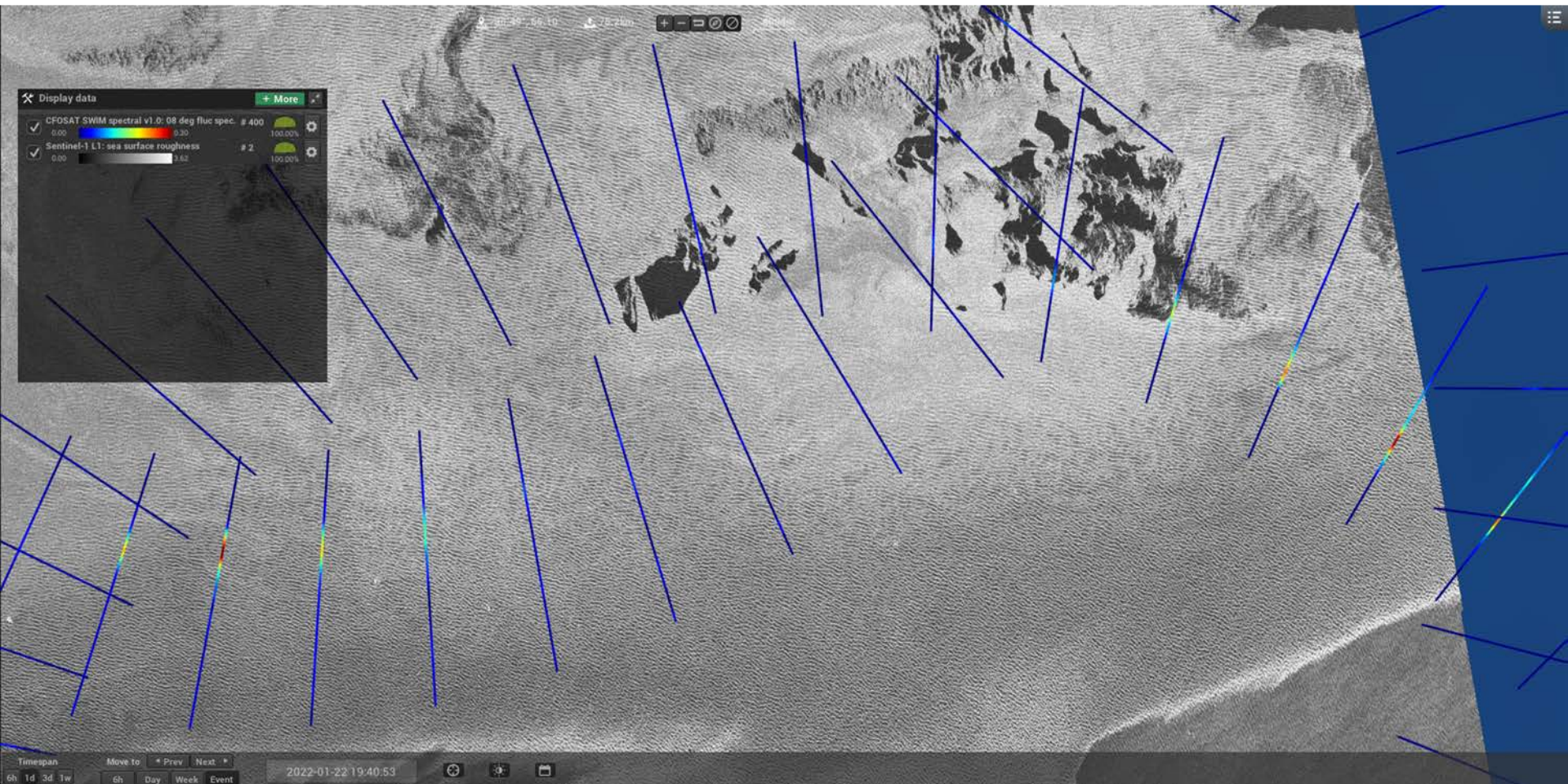


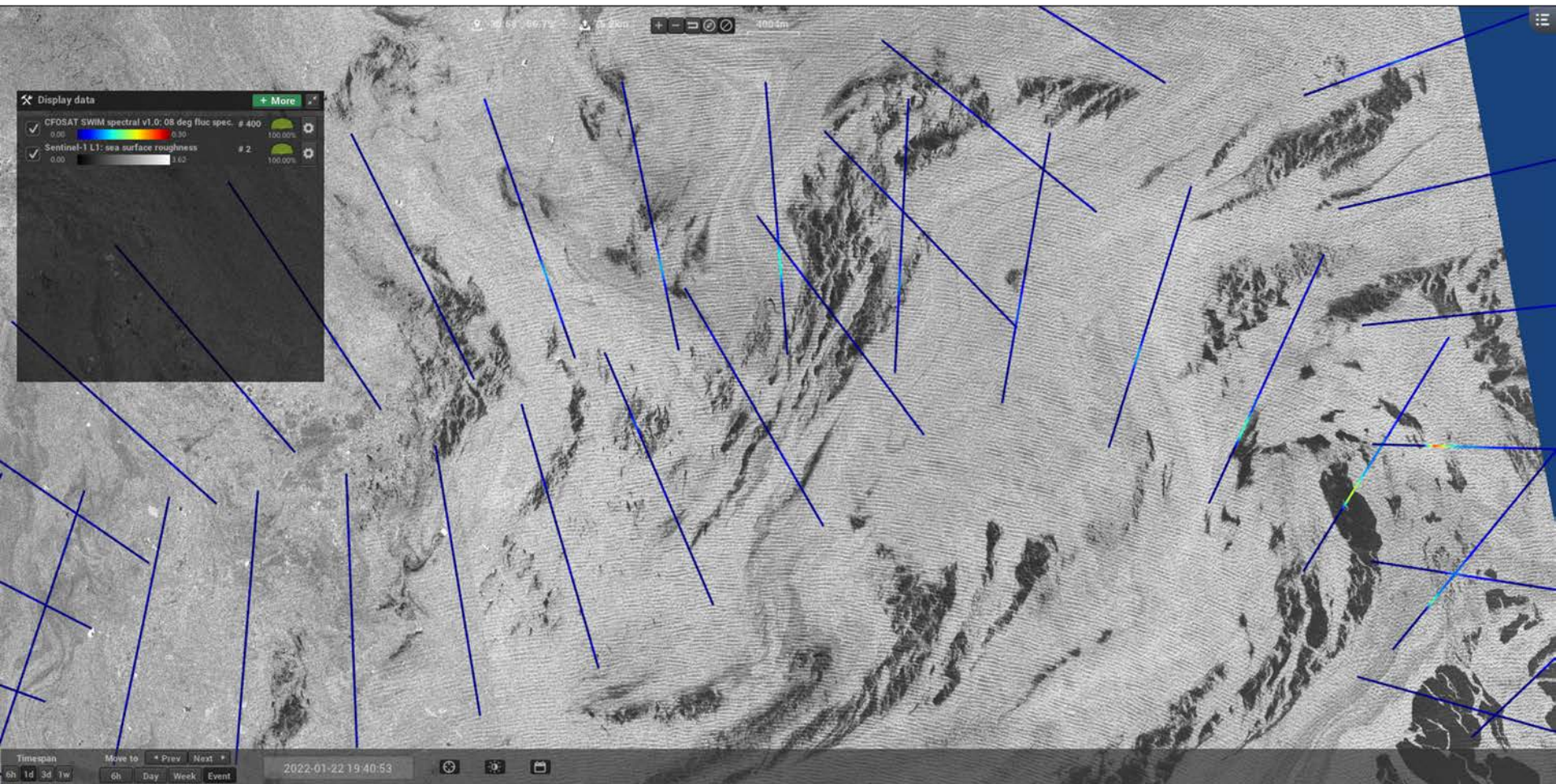


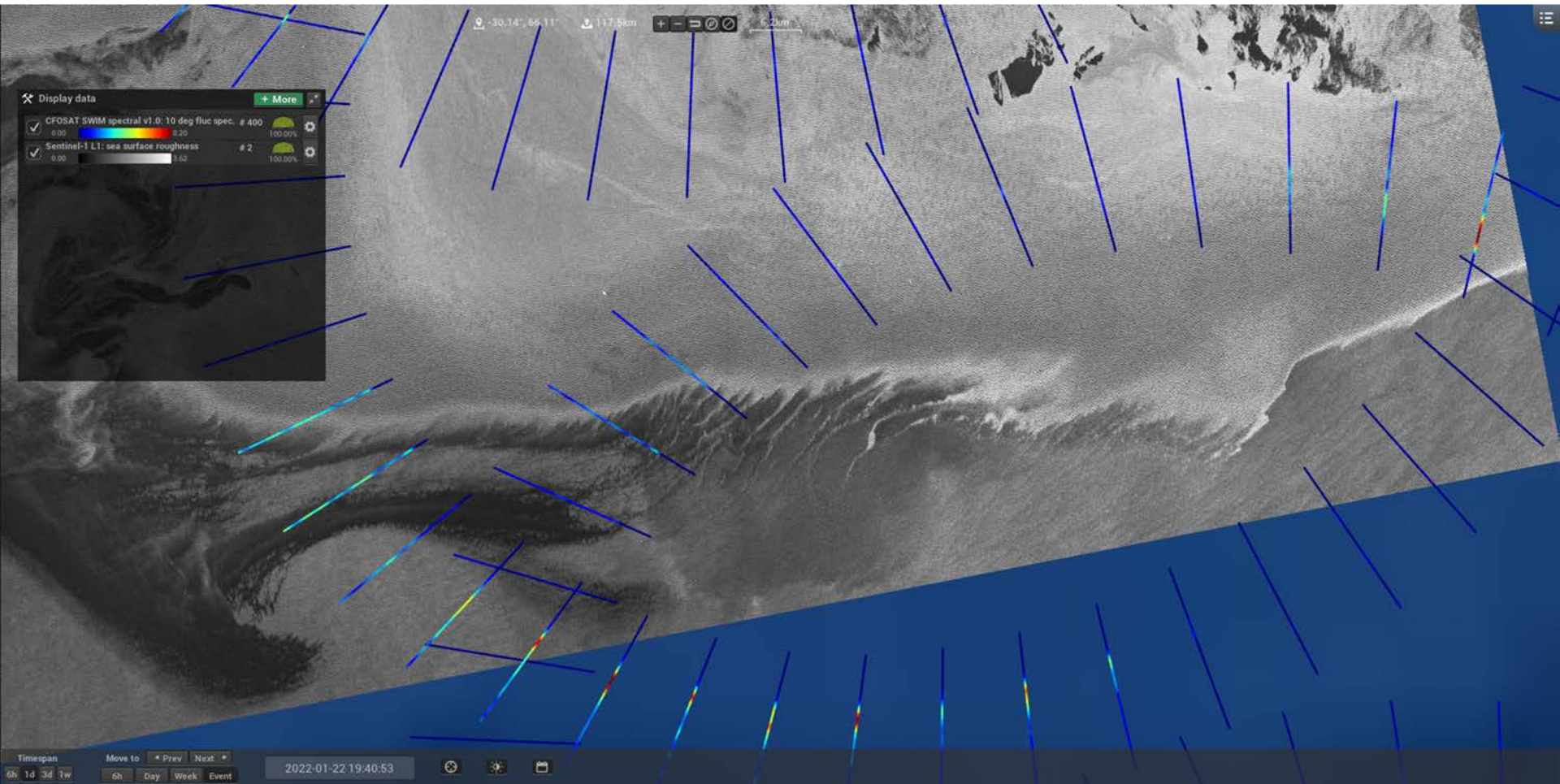






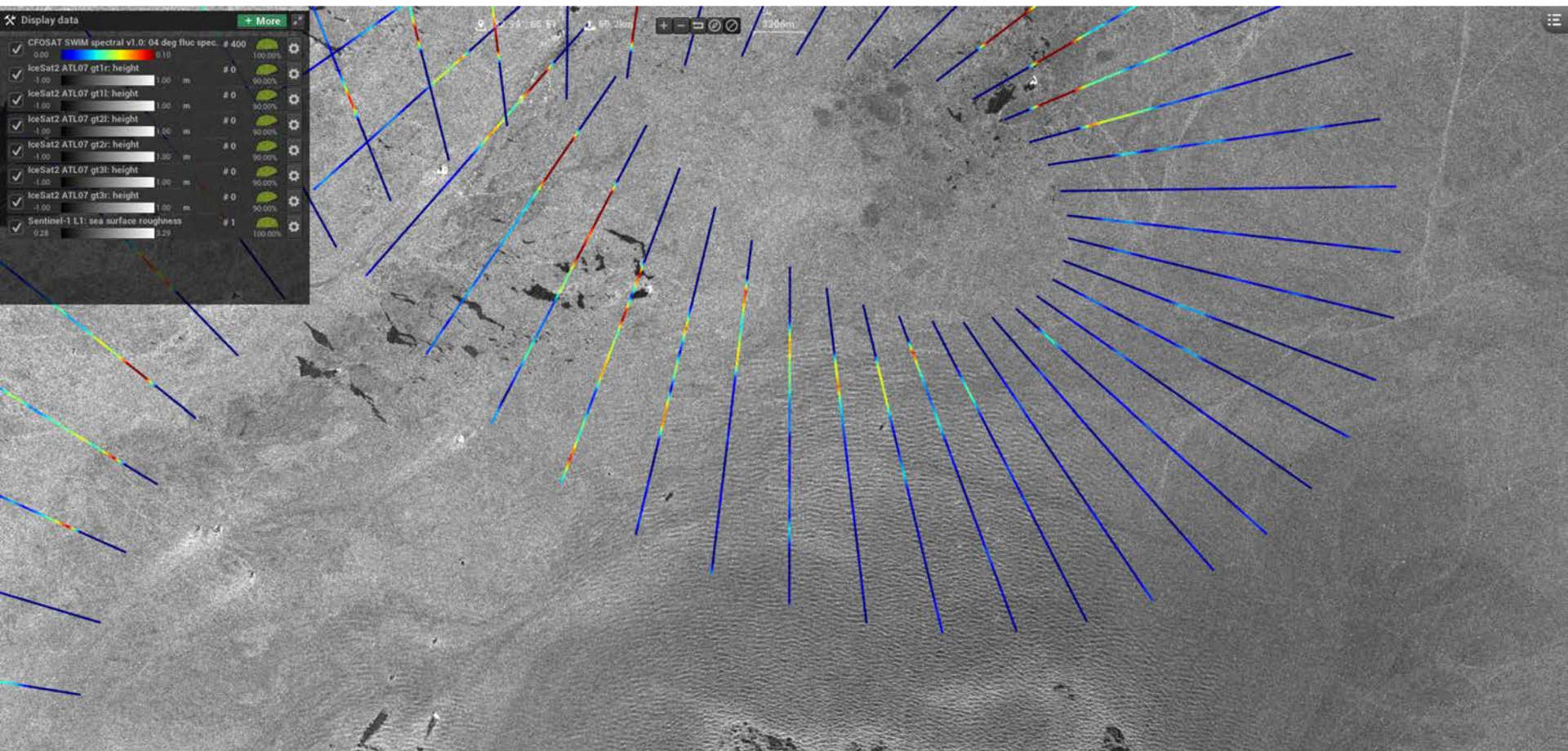


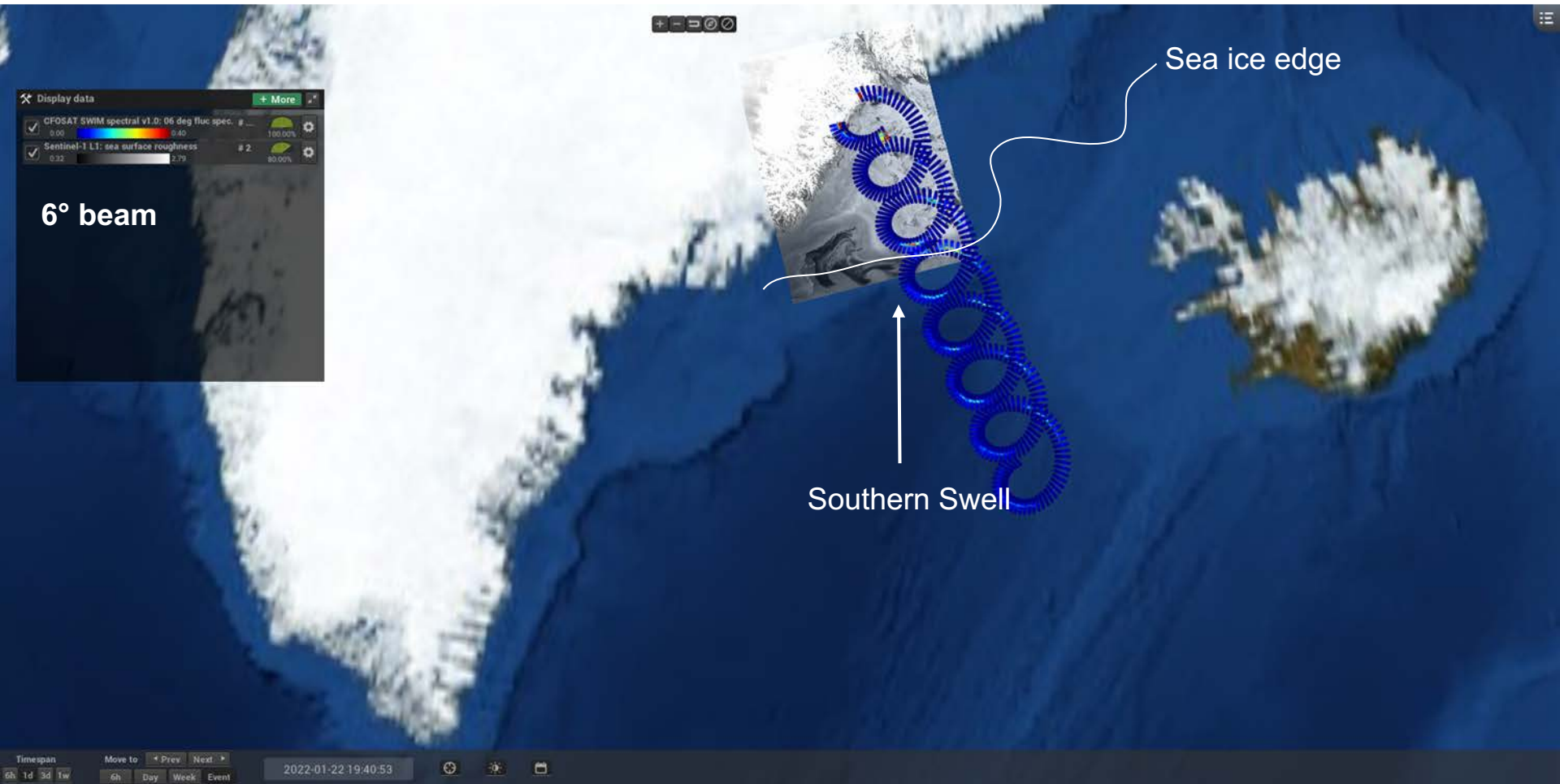




Display data + More

- ☒ CFOSAT SWIM spectral v1.0: 04 deg fluc spec. # 400
0.00 0.10
- ☒ IceSat2 ATL07 gt1r: height
-1.00 1.00 m # 0
- ☒ IceSat2 ATL07 gt1l: height
-1.00 1.00 m # 0
- ☒ IceSat2 ATL07 gt2r: height
-1.00 1.00 m # 0
- ☒ IceSat2 ATL07 gt2l: height
-1.00 1.00 m # 0
- ☒ IceSat2 ATL07 gt3r: height
-1.00 1.00 m # 0
- ☒ IceSat2 ATL07 gt3l: height
-1.00 1.00 m # 0
- ☒ Sentinel-1 L1: sea surface roughness
0.28 3.29 # 1





✕ Display data

+ More

✓ CFOSAT SWIM spectral v1.0: 06 deg fluc spec. # 1

0.000.40

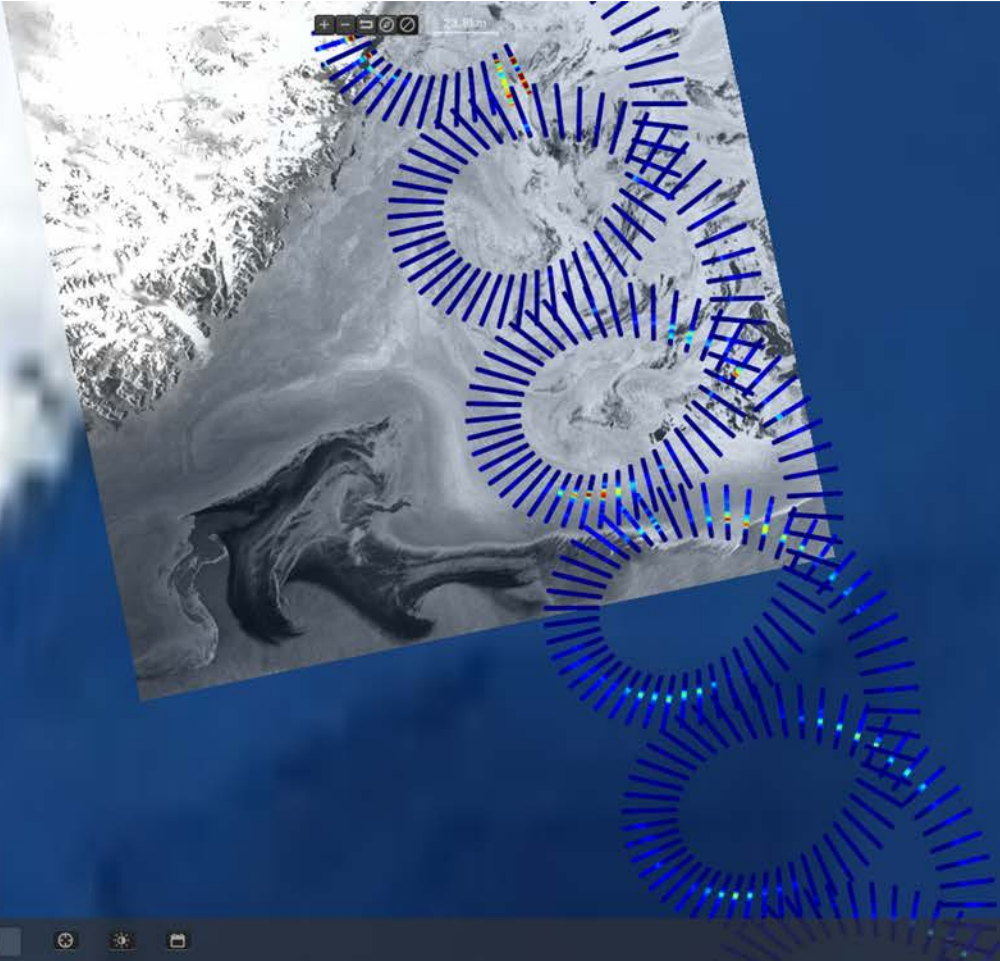
100.00%

✓ Sentinel-1 L1: sea surface roughness # 2

0.222.79

80.00%

6° beam



Display data + More

- ☒ CFOSAT SWIM spectral v1.0: 06 wavenumber... # 100 100.00%
- ☒ CFOSAT SWIM spectral v1.0: 06 deg fluc spec. # 0.40 100.00%
- ☒ Sentinel-1 L1: sea surface roughness # 2 80.00%

6° beam

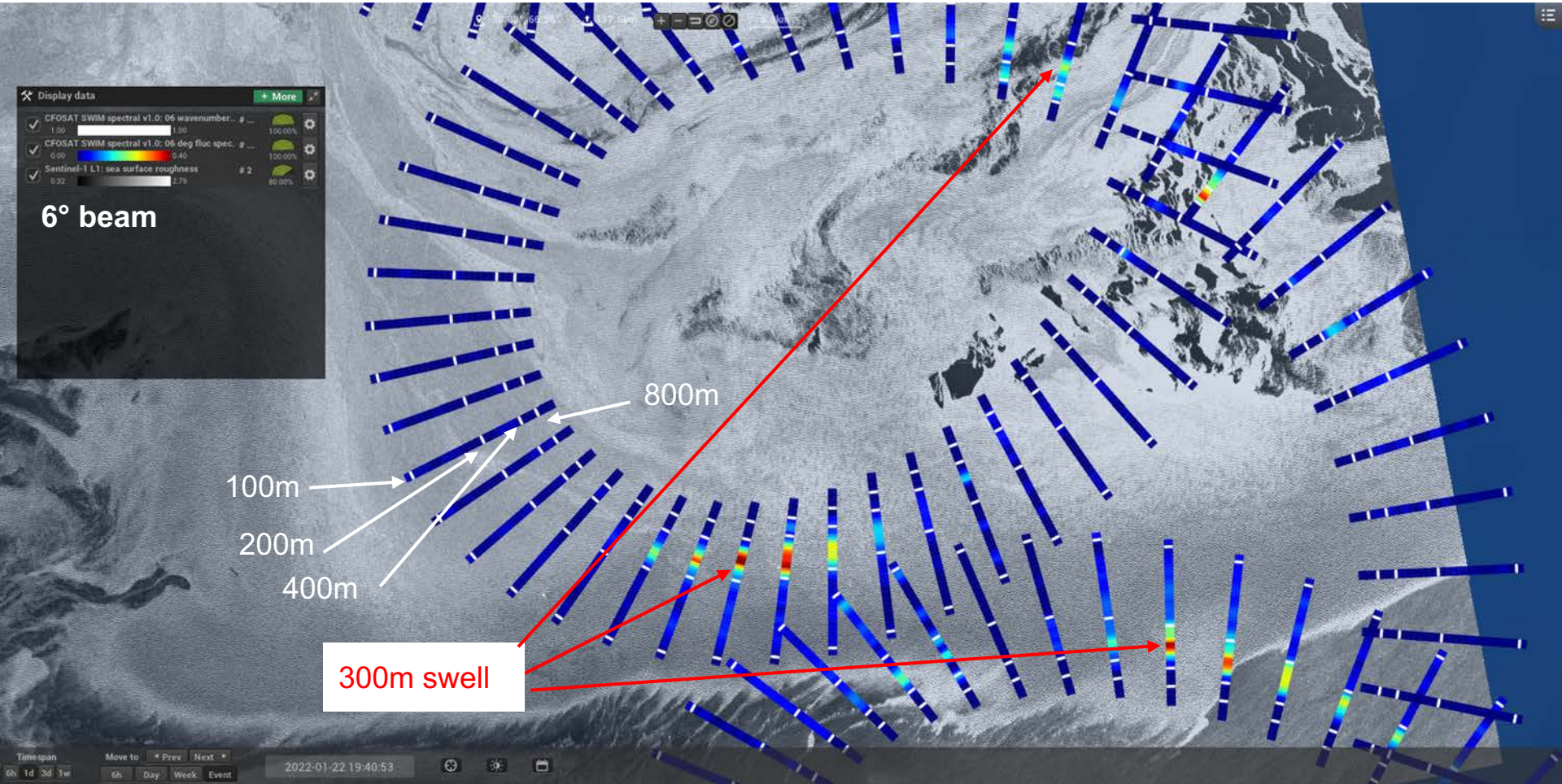
800m

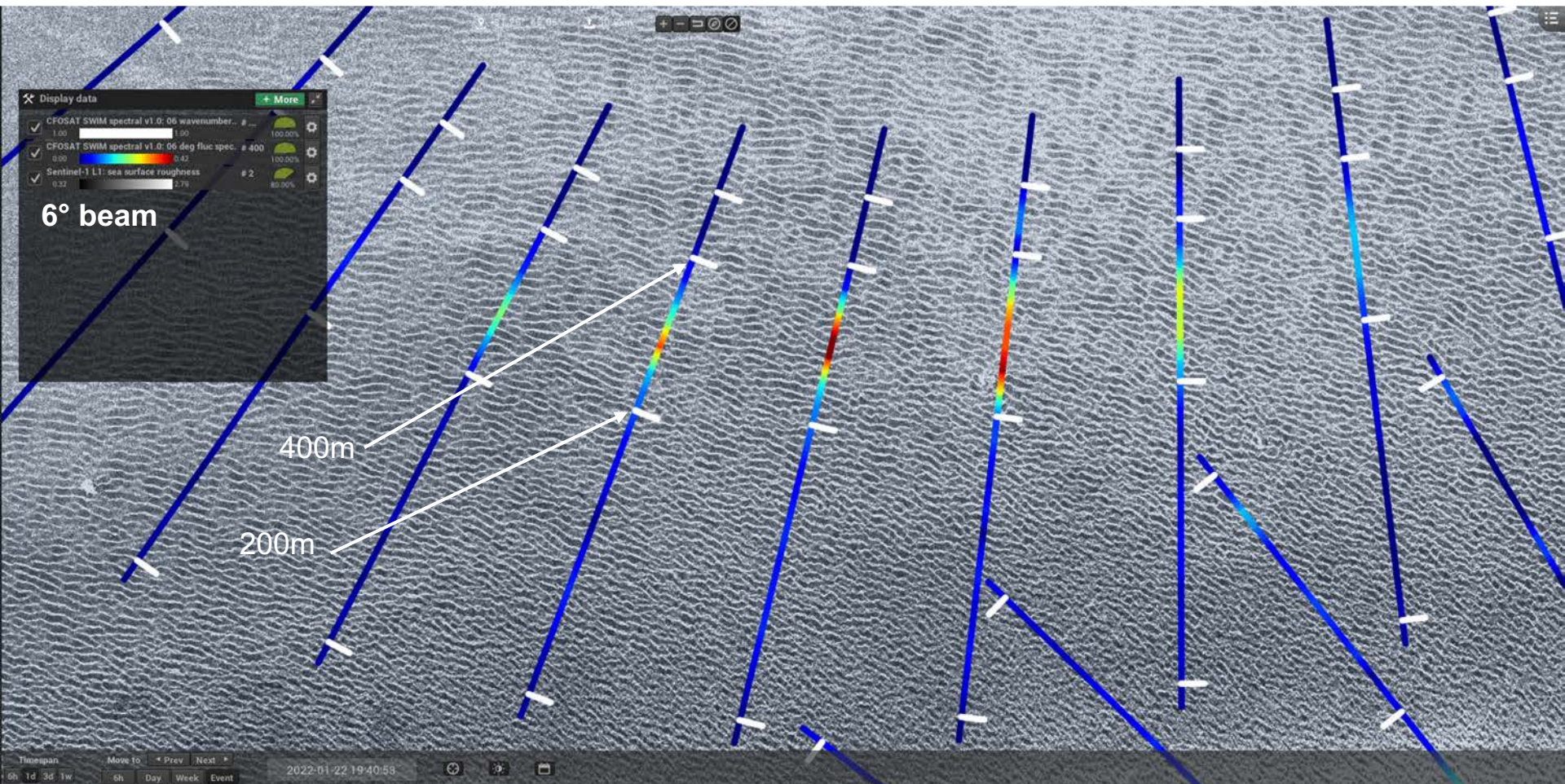
100m

200m

400m

300m swell

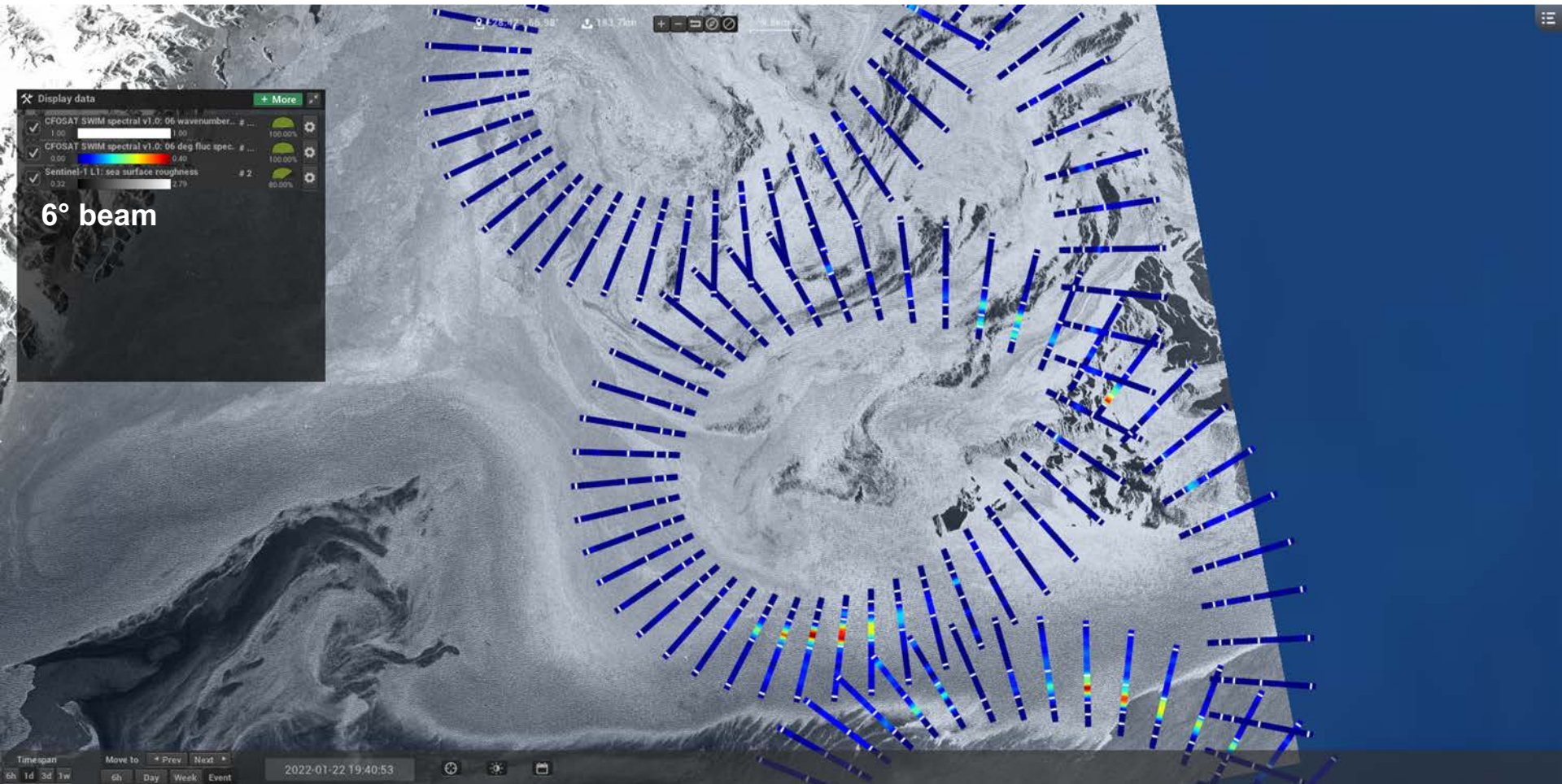


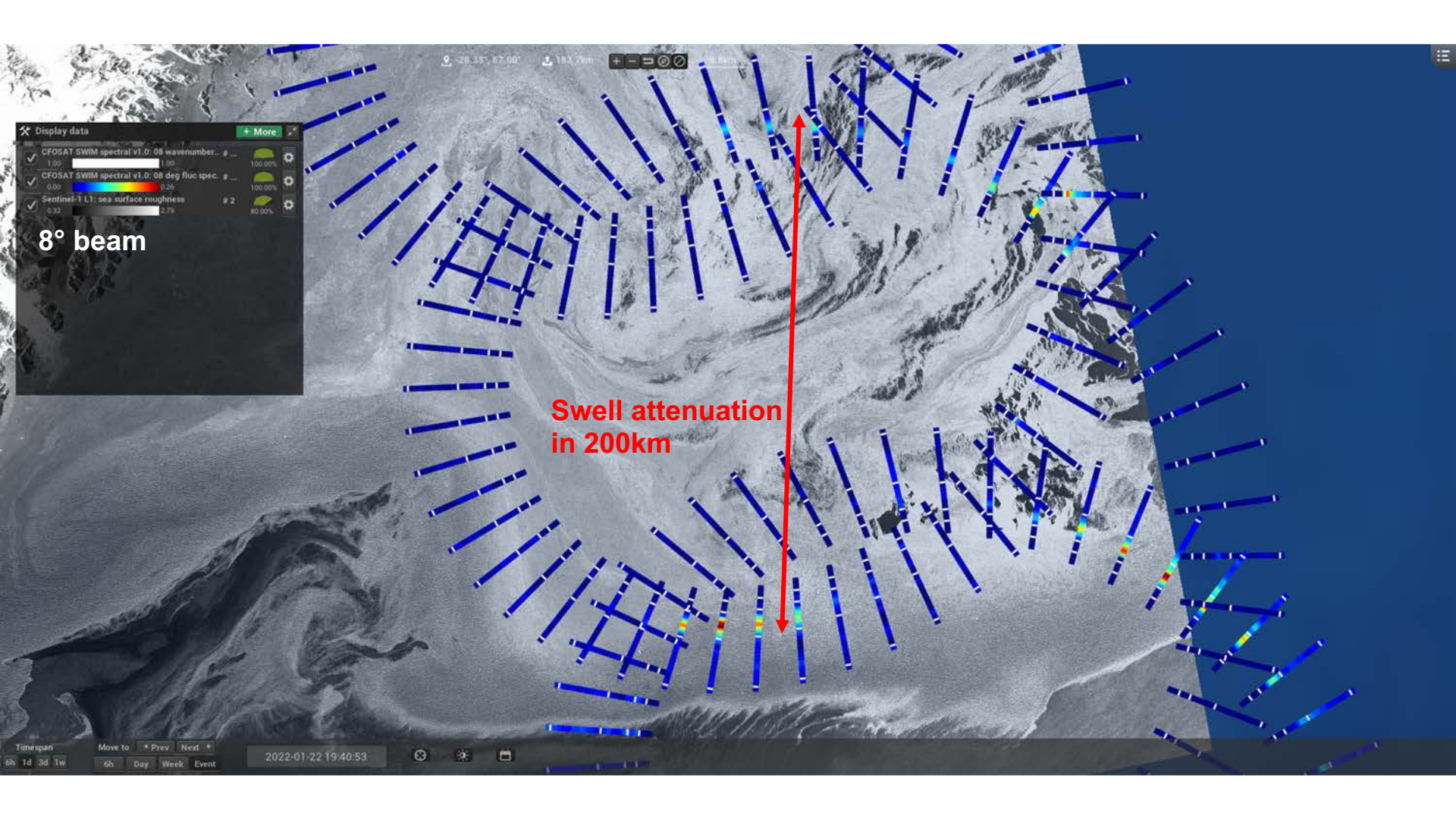


✖ Display data + More

- ☒ CFOSAT SWIM spectral v1.0: 06 wavenumber... # 100 100.00%
- ☒ CFOSAT SWIM spectral v1.0: 06 deg fluc spec. # 400 0.00 100.00%
- ☒ Sentinel-1 L1: sea surface roughness # 2 0.32 80.00%

6° beam



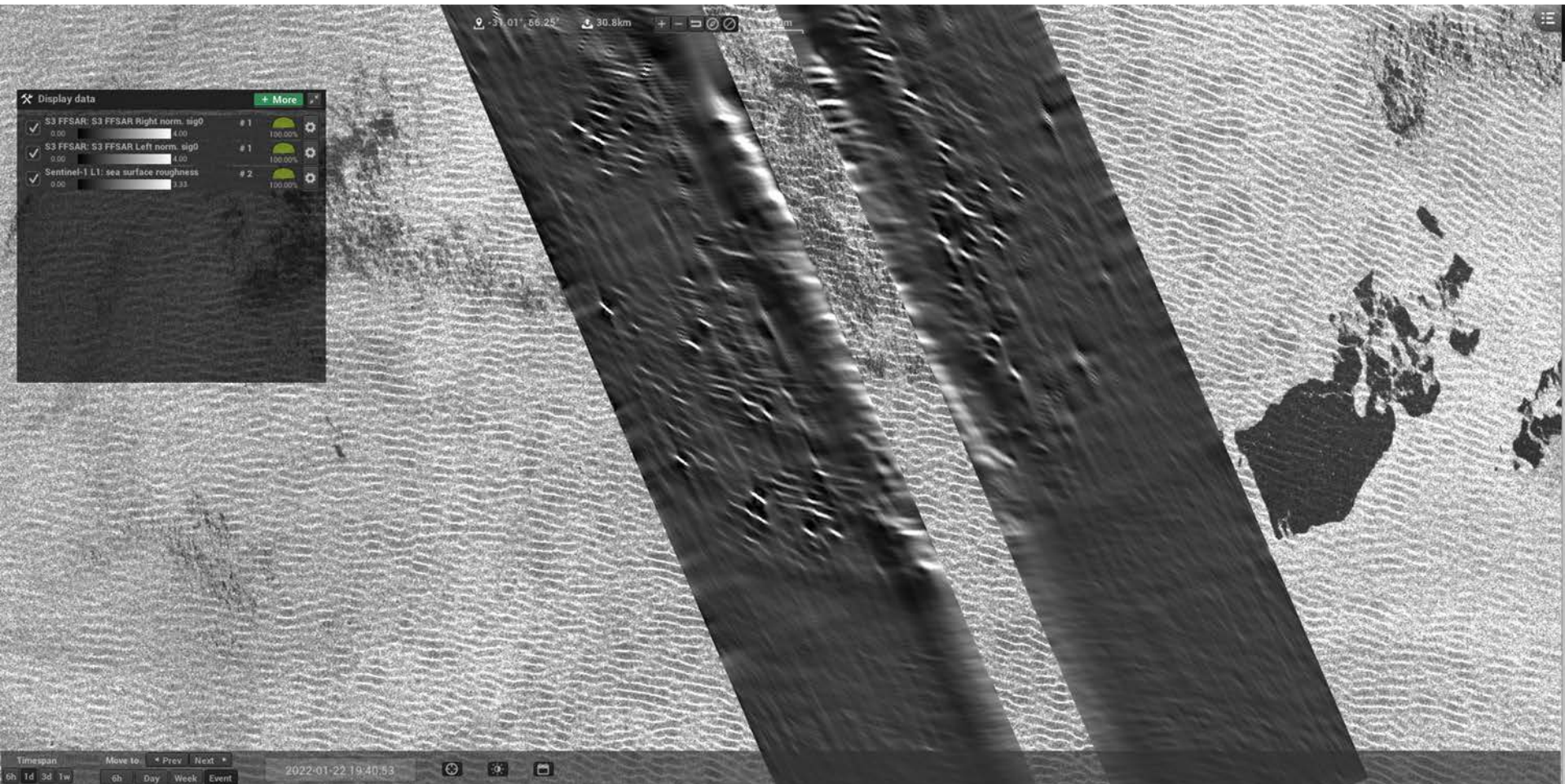


8° beam

Swell attenuation
in 200km

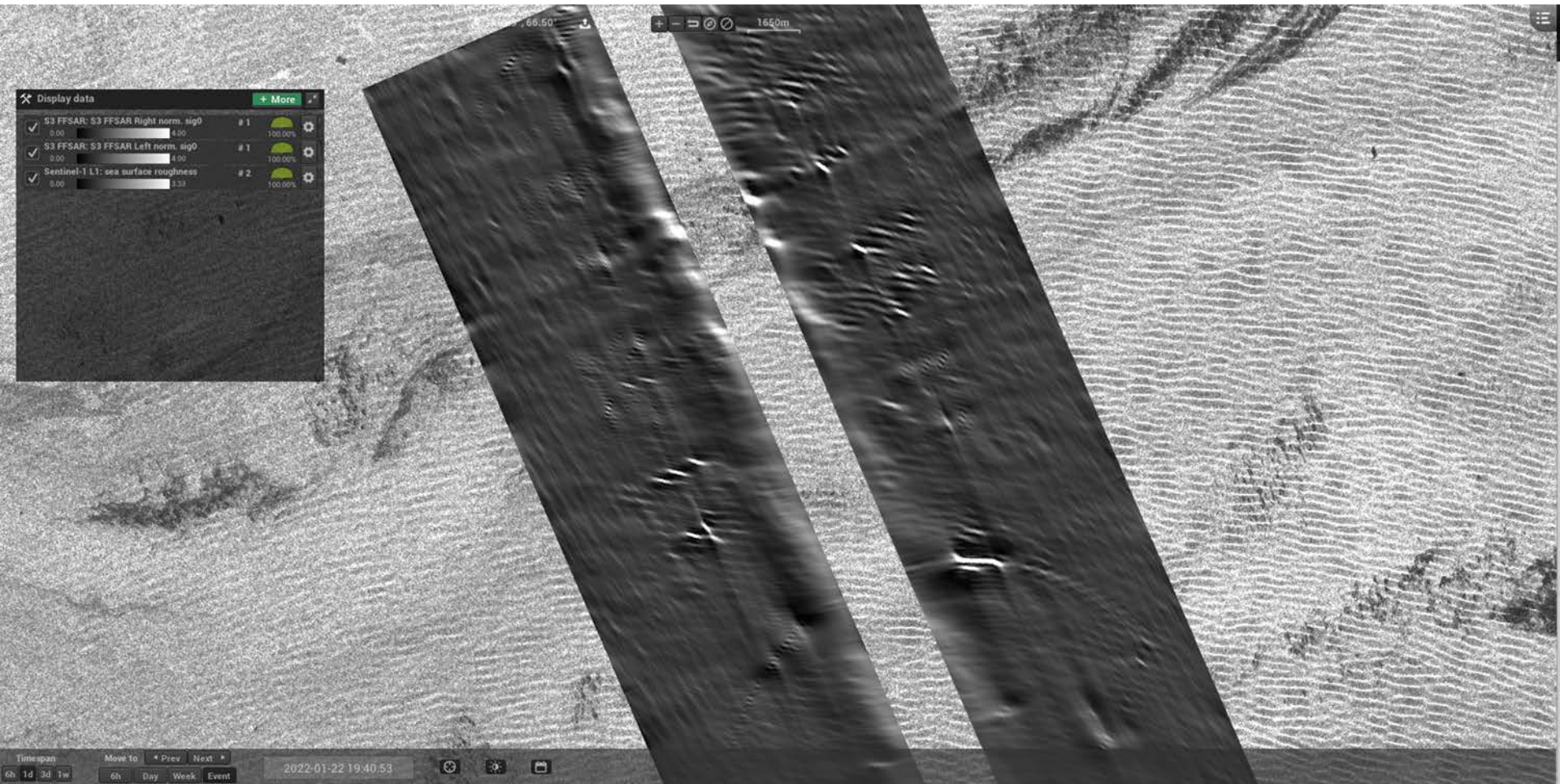
Time span
6h 1d 3d 1w

2022-01-22 19:40:53

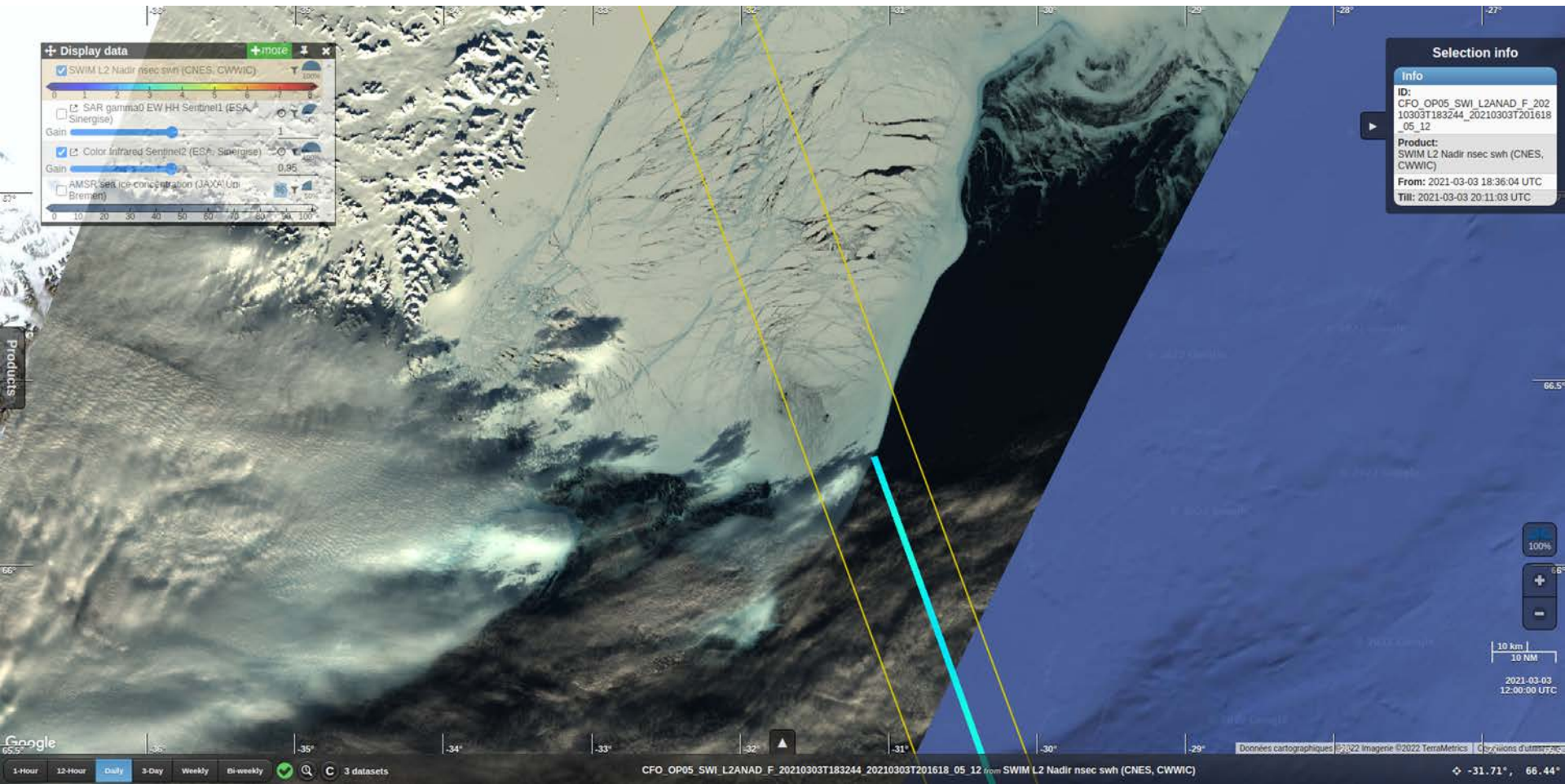


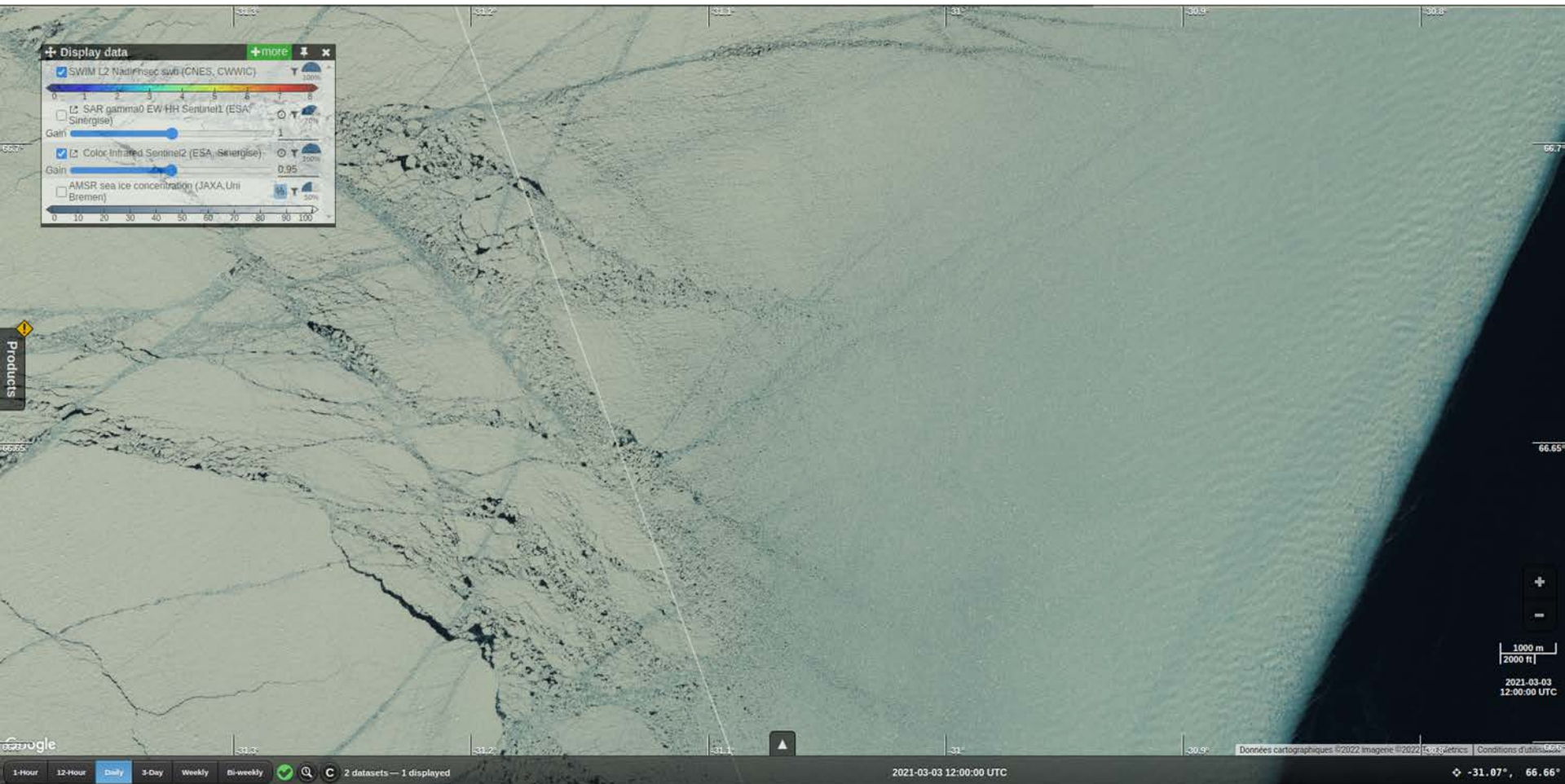
Display data + More

<input checked="" type="checkbox"/>	S3 FFSAR: S3 FFSAR Right norm. sig0	# 1		
<input checked="" type="checkbox"/>	S3 FFSAR: S3 FFSAR Left norm. sig0	# 1		
<input checked="" type="checkbox"/>	Sentinel-1 L1: sea surface roughness	# 2		



3 March 2021 : https://odl.bzh/9Zh_w59J





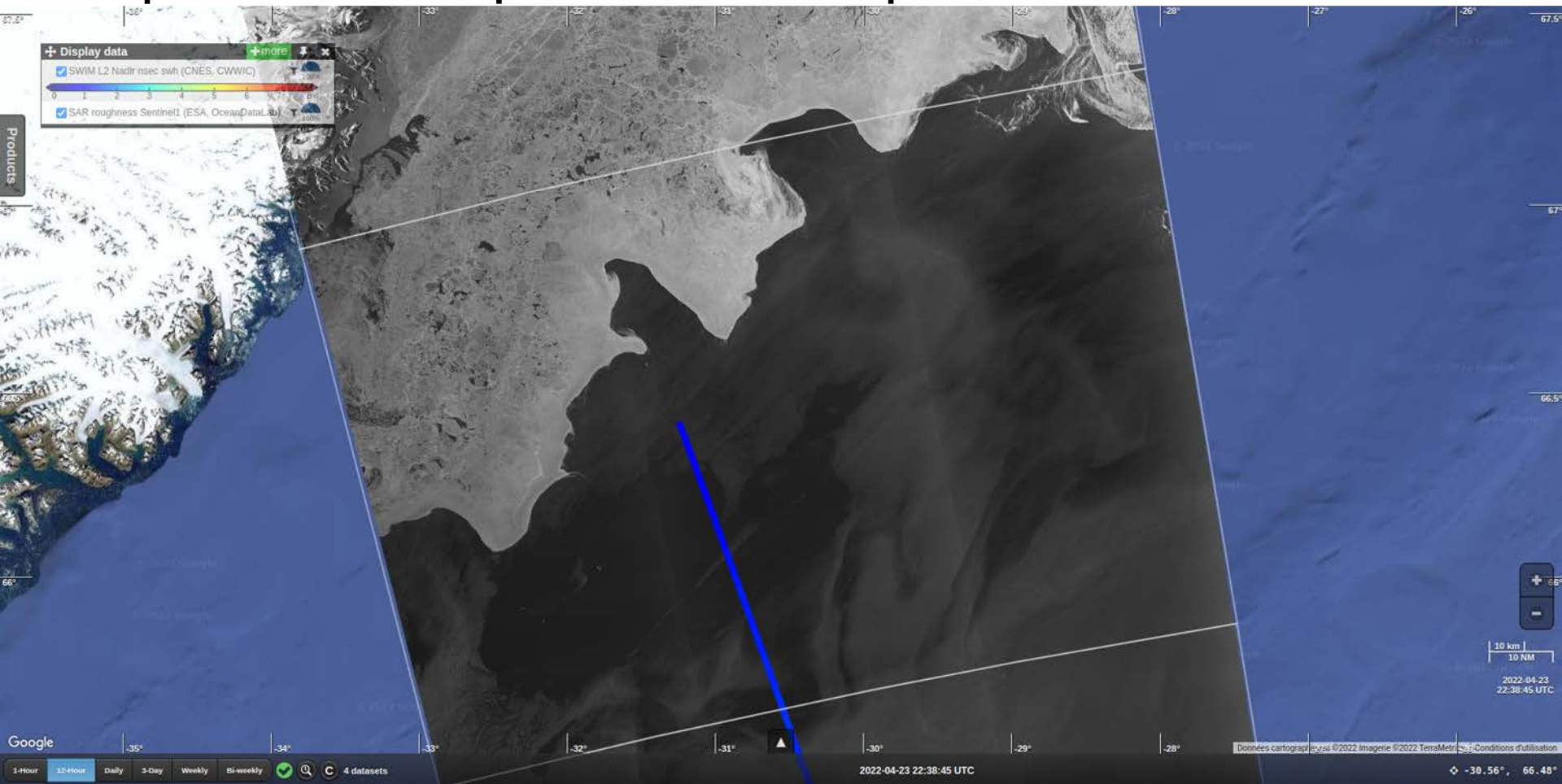
Google

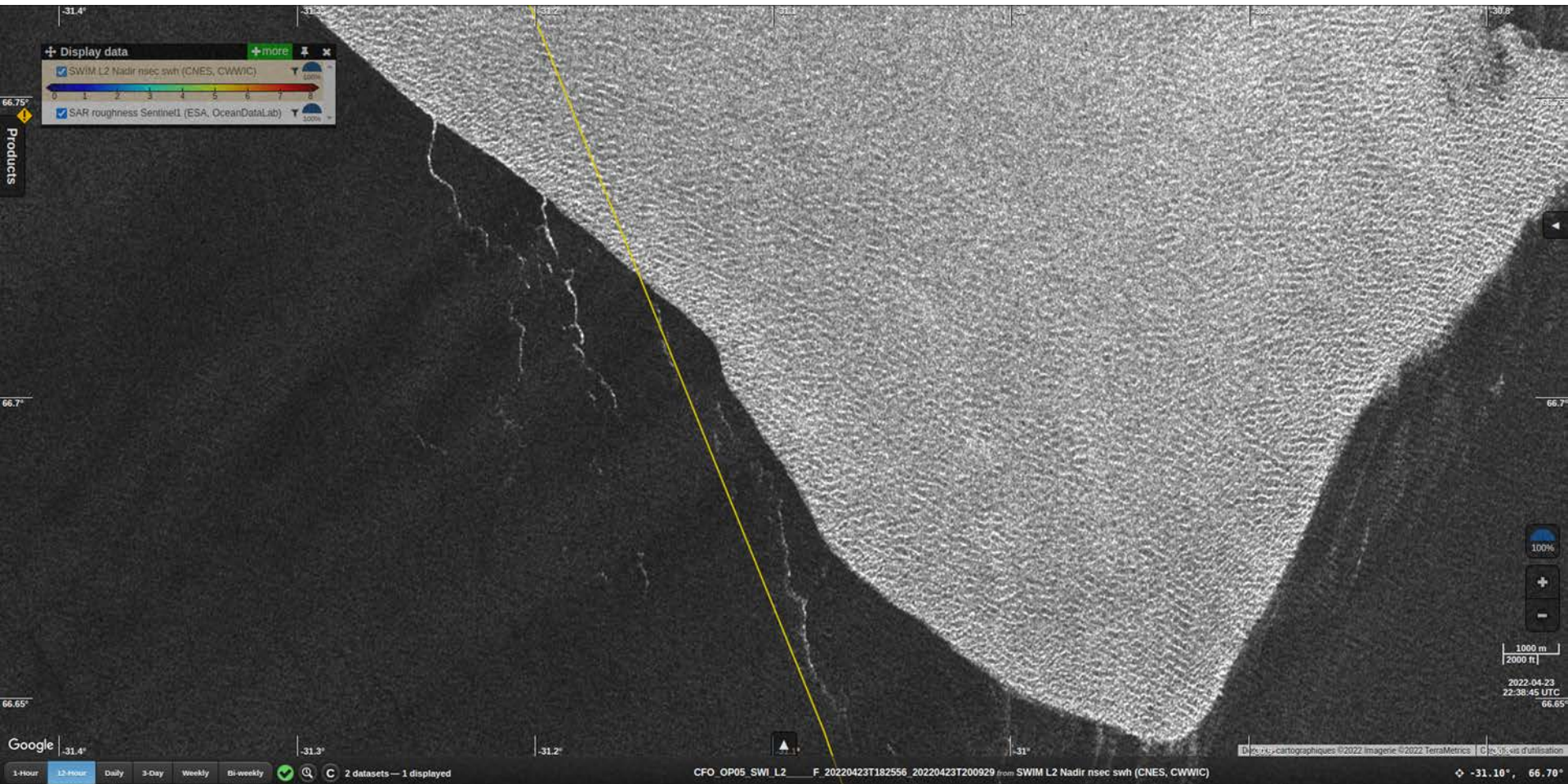
1 Hour 12 Hour Daily 3 Day Weekly Bi-weekly 2 datasets — 1 displayed

2021-03-03 12:00:00 UTC

Données cartographiques ©2022 Imaginer ©2022 5.08.666666 Conditions d'utilisation

23 April 2022 : <https://odl.bzh/DqUlwsft>





Display data + more ⌵ ✕

☒ SWIM L2 Nadir nsec swi (CNES, CWWIC) ⌵ 100%

☒ SAR roughness Sentinel1 (ESA, OceanDataLab) ⌵ 100%

Products

100%

+

-

1000 m
2000 ft

2022-04-23
22:38:45 UTC

66.65°