ENROLMENT OF EM2040

at the Norwegian Hydrograpic Service

Presented by Harald Sæther

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- Presentation by Harald Sæther
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  - Surveyor and data processor since 2004
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Enrolment of EM2040

- At the end of 2012 the Norwegian Hydrographic Services purchased two sets of EM2040 Dual Heads
- They will be installed on two new launching vessels, expected to be delivered the fall of 2013
- In addition there will be a third vessel operated by NHS, but owned by the Norwegian Coastal Administration (Kystverket).

Trials EM2040

- Prior to the purchase, in October 2011, Kongsberg allowed NHS to test EM2040 on one of our own vessels.

- The test area was just outside Florø, where the bathymetry is very rough, and where NHS had previously experienced a lot of poor quality data due to the shape of the seabed.

Installation EM2040

- Mounted on the bow of Sjøtroll, october 2011.

Kartverket

Execution

- The idea was to compare data from the EM2040 with data from the already installed EM3002 Dual head system.

- The trials for EM2040 were performed several times on different locations…
- and were repeated the next day using EM3002D

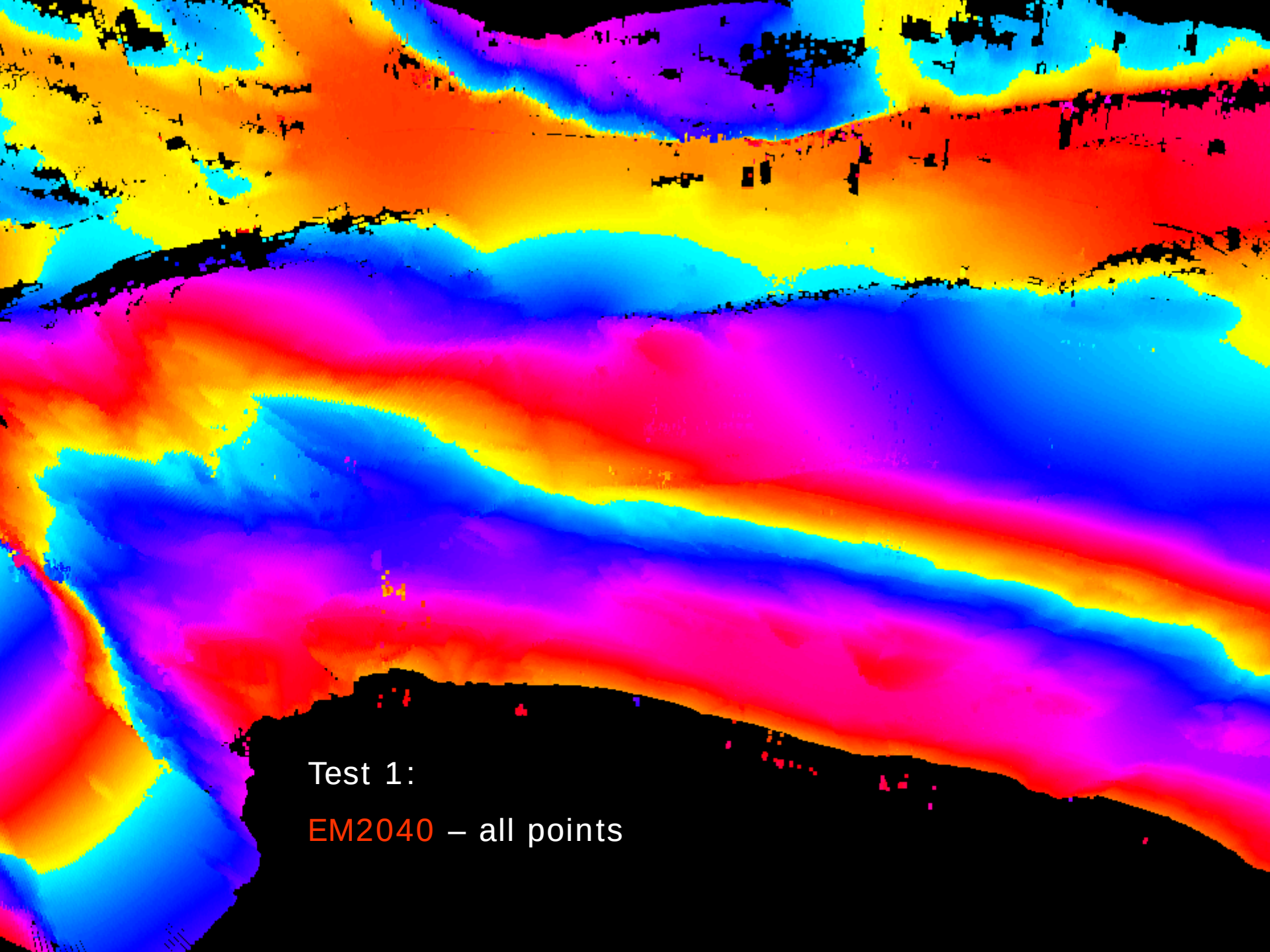
The study

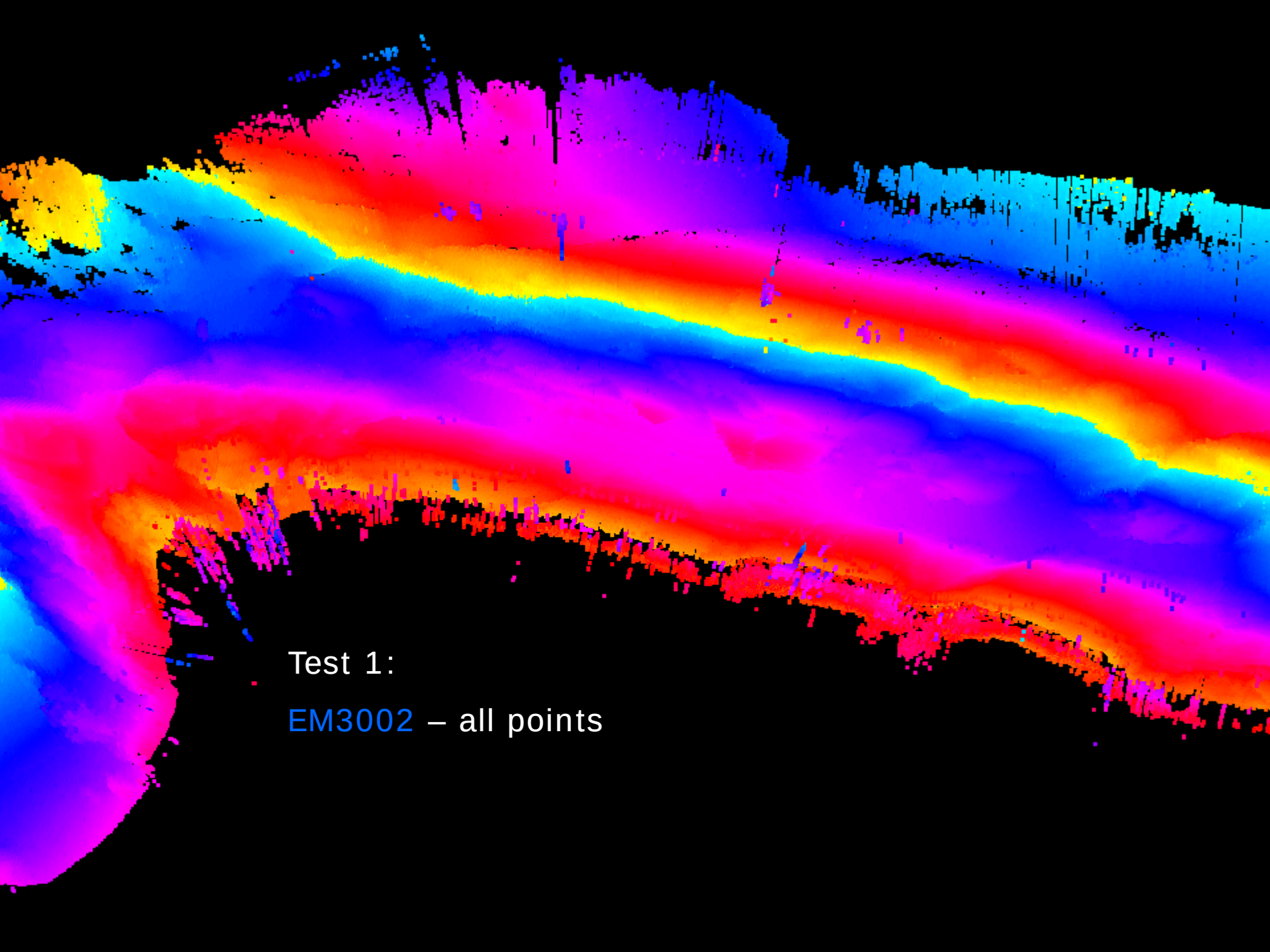
- Each survey consisted of 5-6 surveylines and of about 5 minutes of logging for each line.
- Neptune was used as the software for post-processing

The answers we searched:

- Did the data look any better than EM3002?
- And how would this effect us in the post-processing? Would we spend even more time processing?

- The data was compared by completely processing both datasets


Test 1:
EM2040 – all points

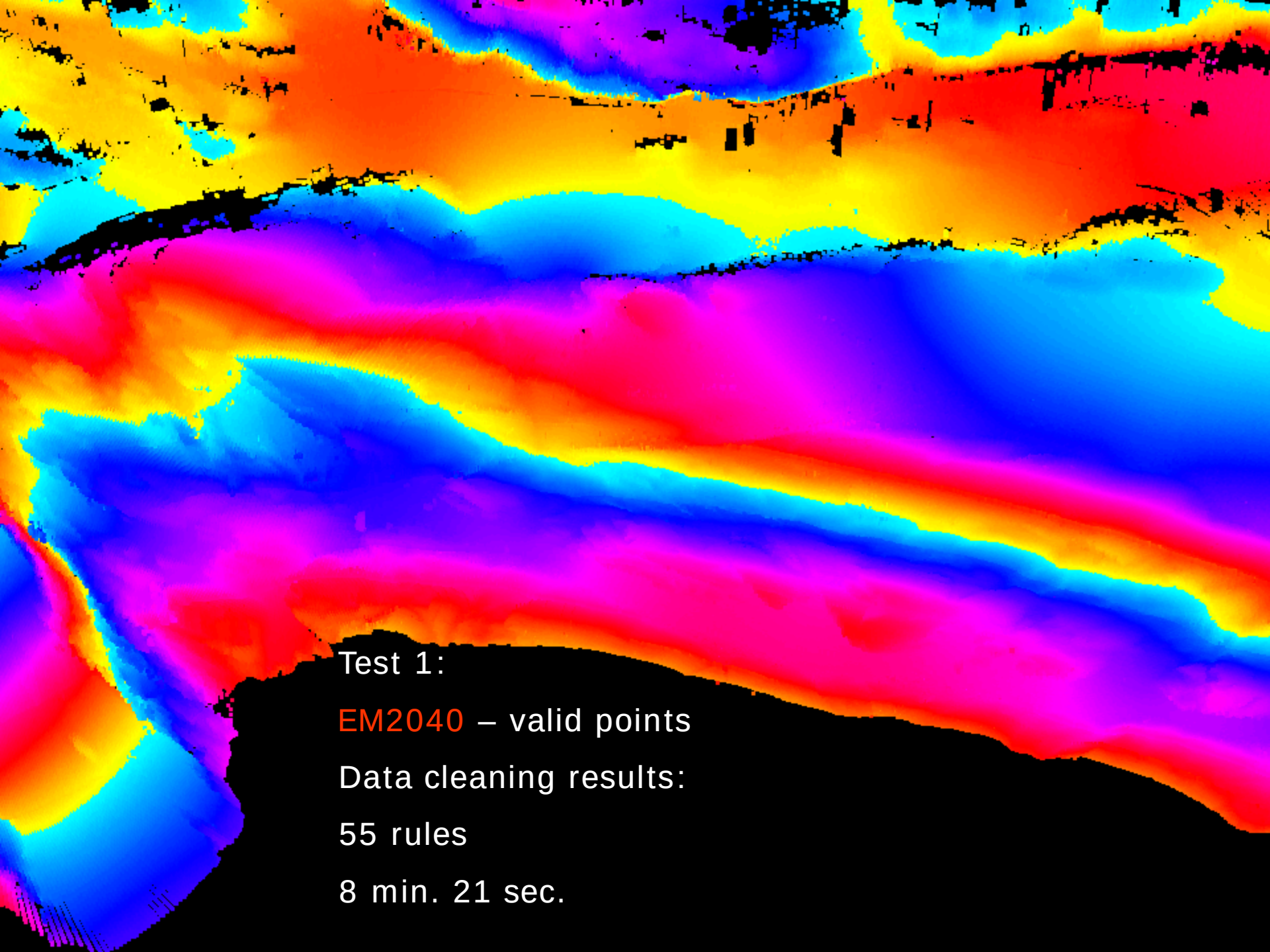

Test 1:
EM3002 – all points

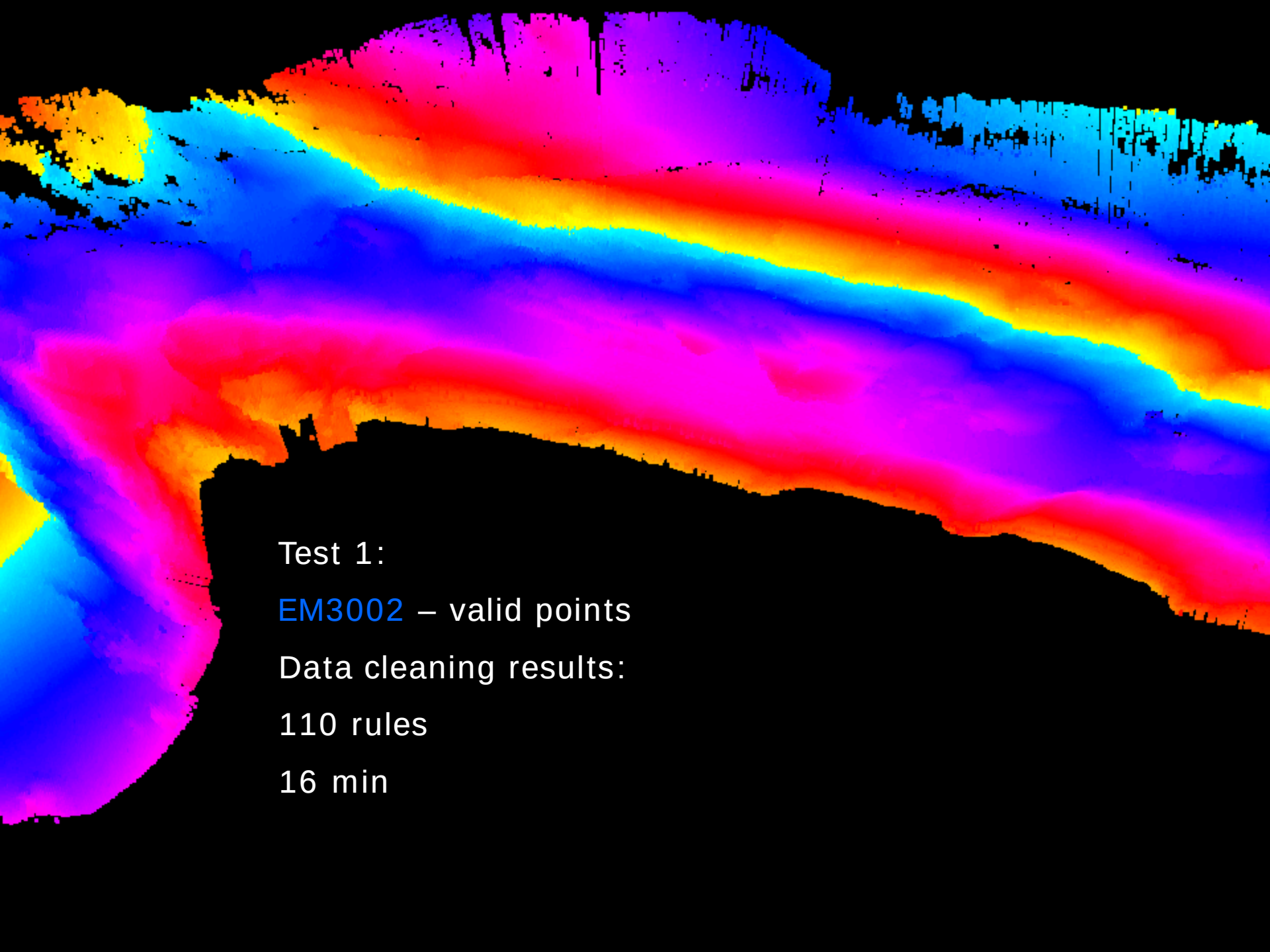
Did you notice any differences?

- If not, go back…

- Nothing has been cleaned at this point.

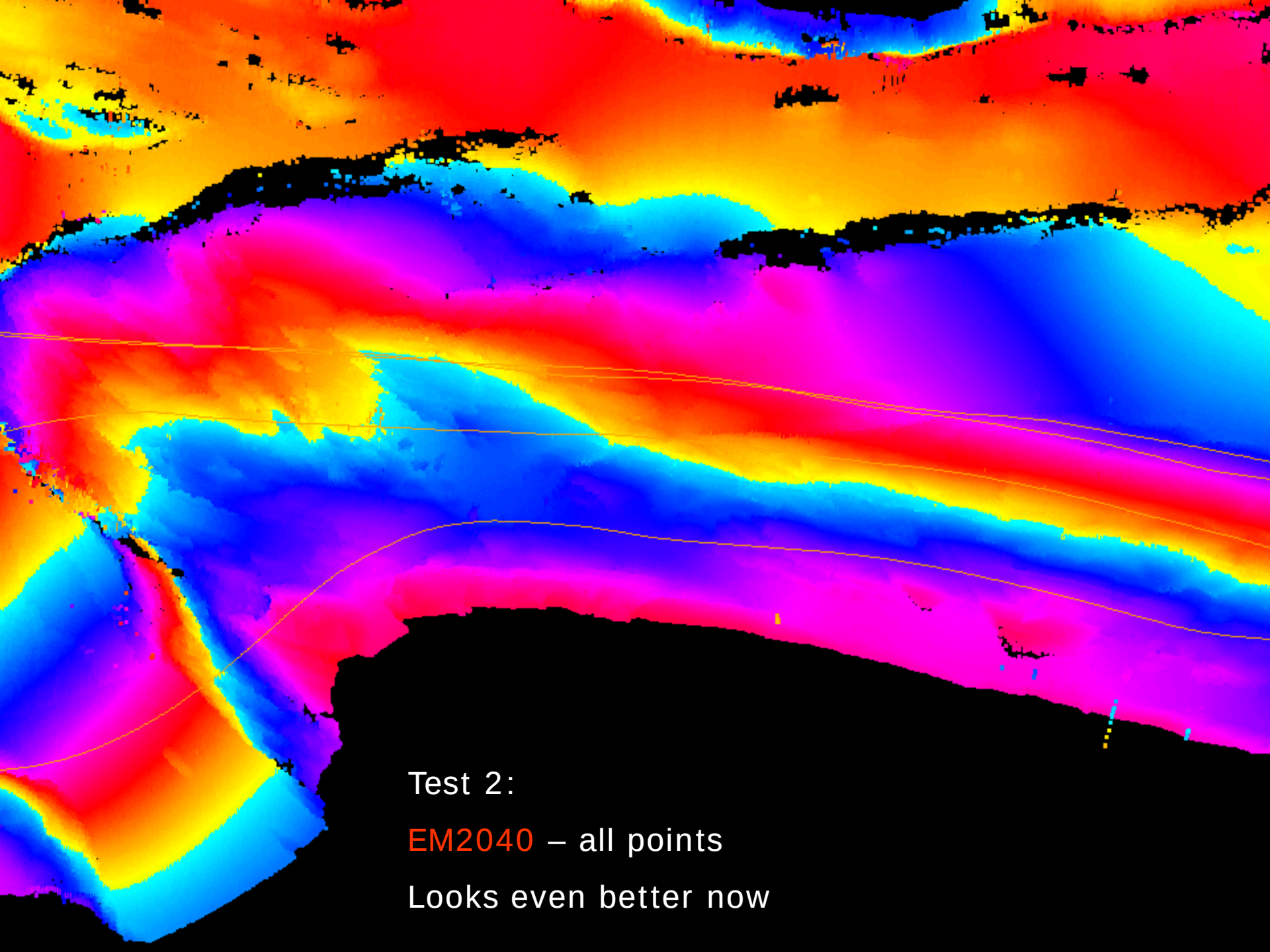
- But after cleaning both sets (EM2040 and EM3002), it looked like this:

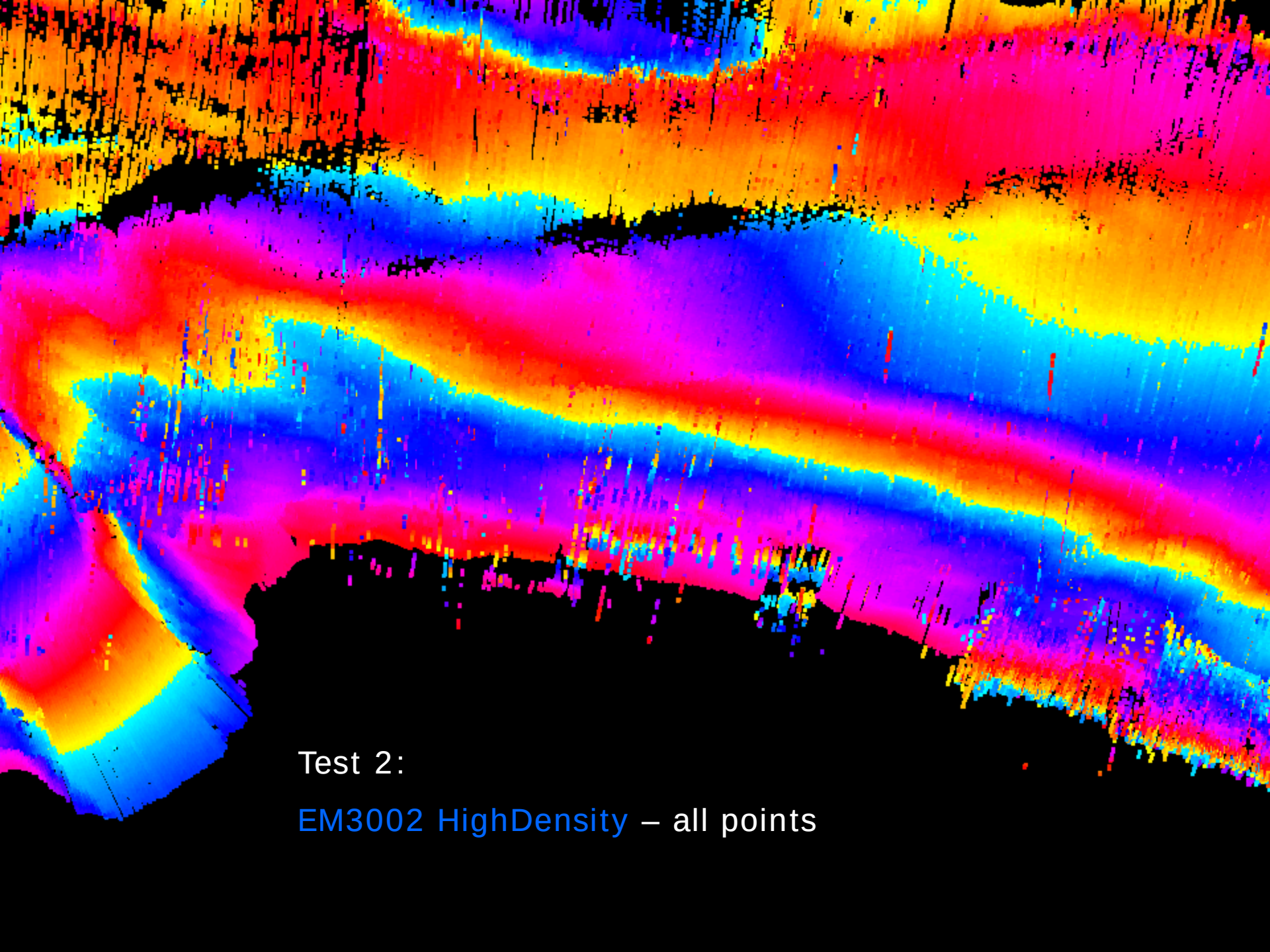

Test 1:
EM2040 – valid points
Data cleaning results:
55 rules
8 min. 21 sec.


Test 1:
EM3002 – valid points
Data cleaning results:
110 rules
16 min

Test 2

- Of course we had to repeat the test with another survey


Test 2:
EM2040 – all points
Looks even better now

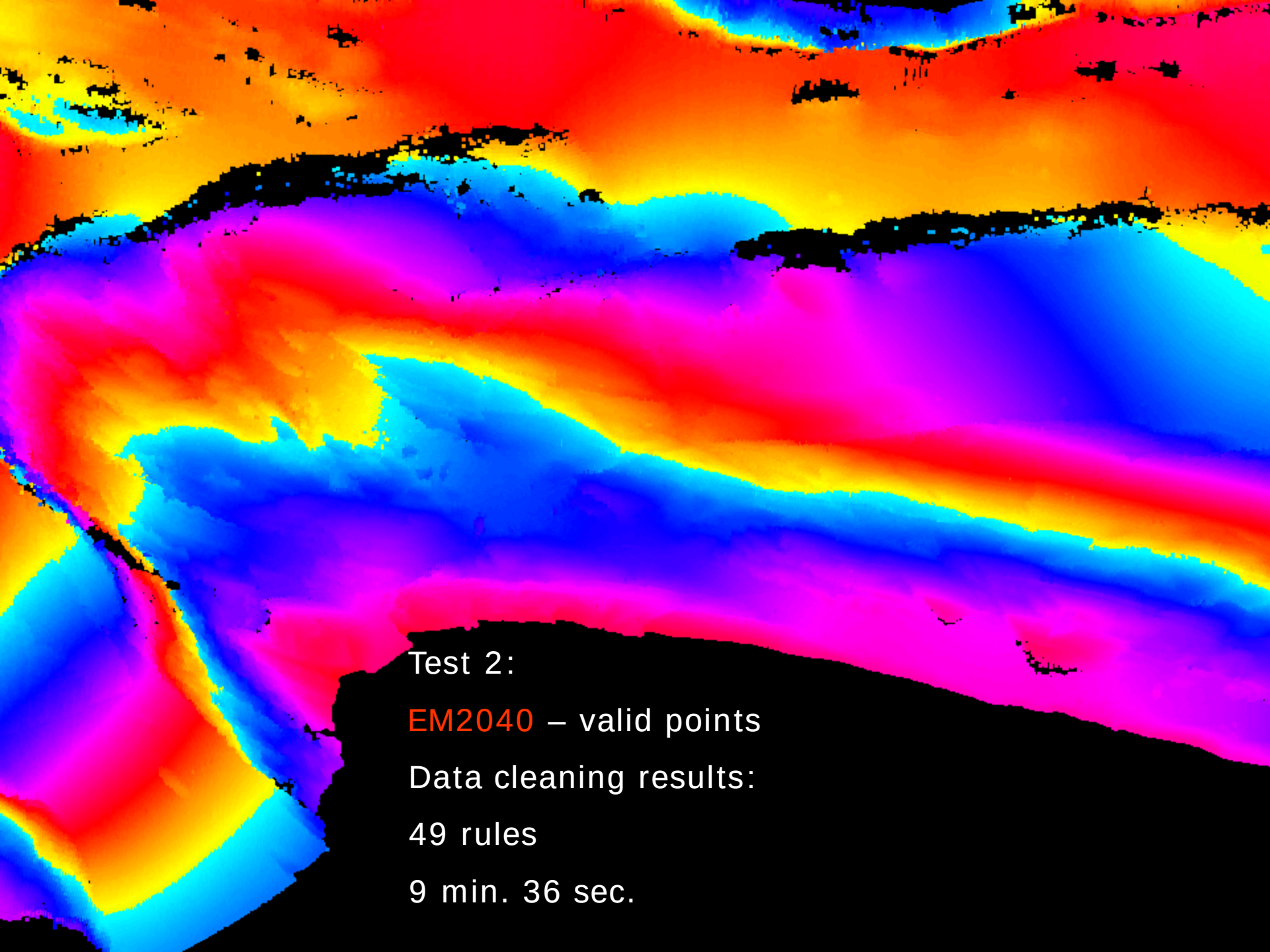


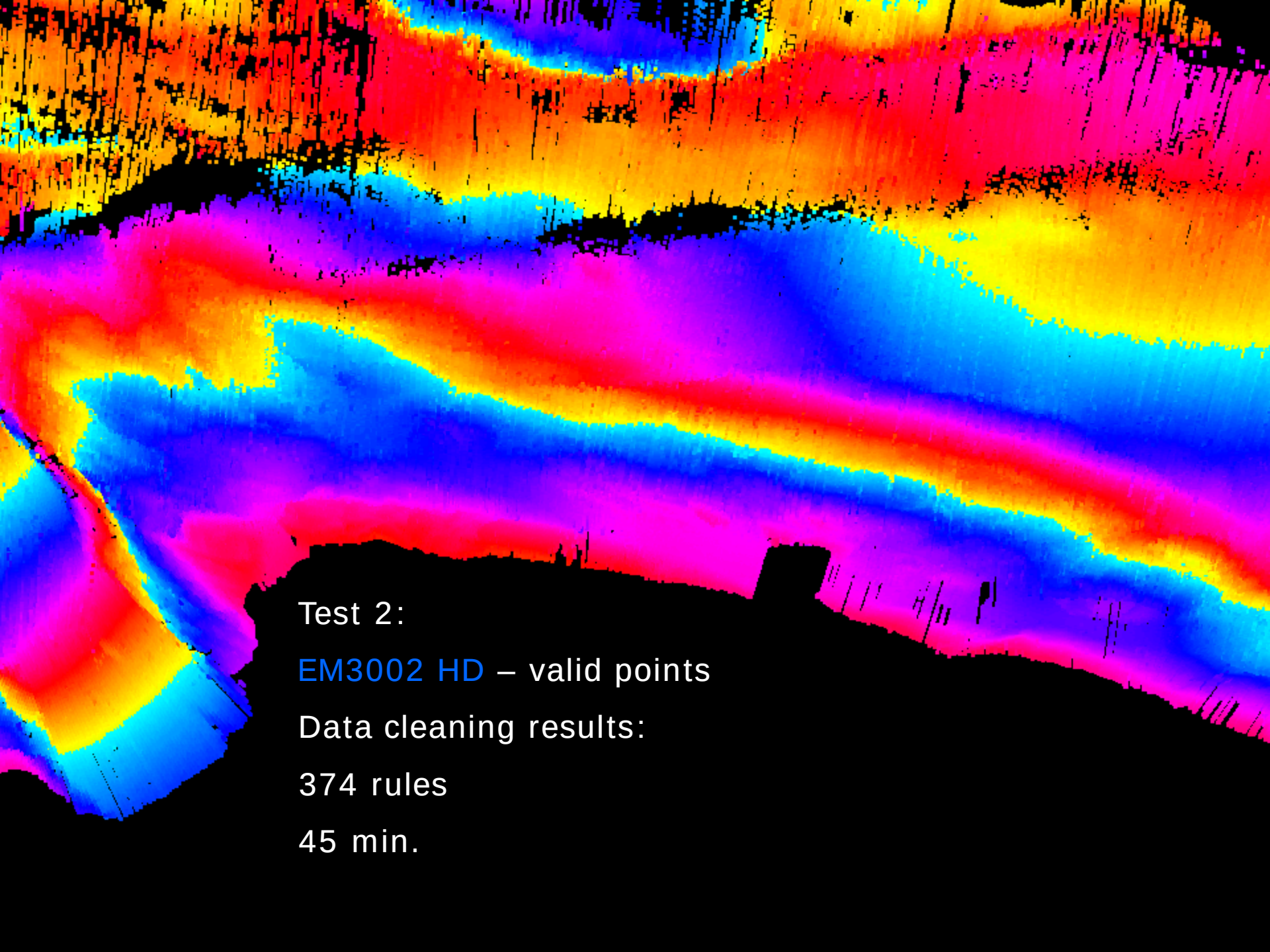
Test 2:

EM3002 HighDensity – all points

You saw the difference this time

- I know you did
- Like any decent data processor I still had to clean the data, and this time the results were:


Test 2:
EM2040 – valid points
Data cleaning results:
49 rules
9 min. 36 sec.


Test 2:
EM3002 HD – valid points
Data cleaning results:
374 rules
45 min.

Test 1

	Rejected Points	Accepted Points
EM3002	109 221(4,6%)	2 269 445
EM2040	33 151 (0,9%)	3 568 743

Test 2

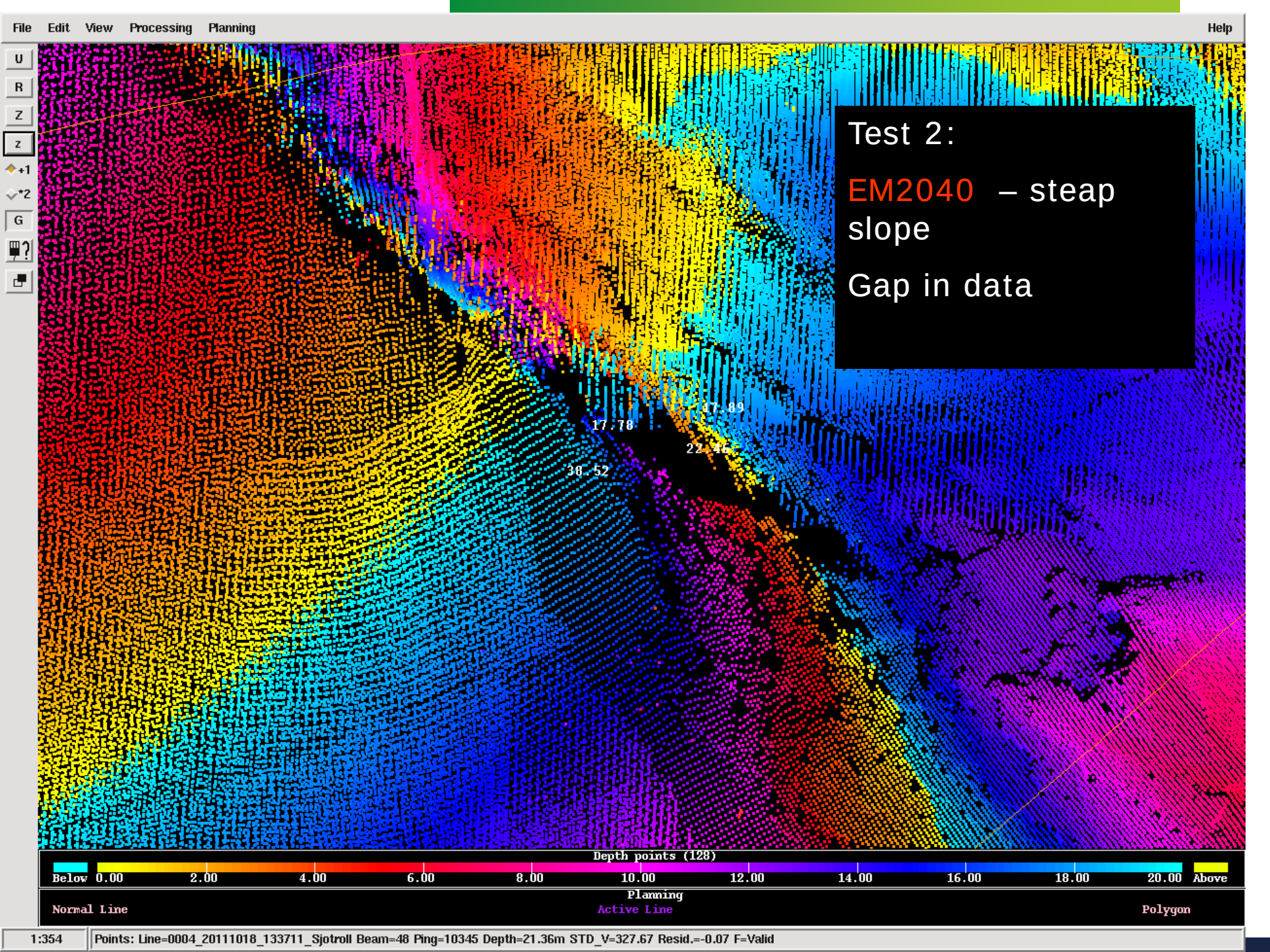
	Rejected Points	Accepted Points
EM3002 HD	233 130(7,3%)	2 950 715
EM2040	63 256 (1,5%)	4 080 211

Summary of data cleaning

	Time Test 1	Time Test 2	# rules Test 1	# rules Test 2	% rejected points Test 1	% rejected points Test 2
EM3002D	16 min	45 min	110	374	4,6 %	7,3 %
EM2040	8,3 min	9,5 min	55	49	0,9 %	1,5 %

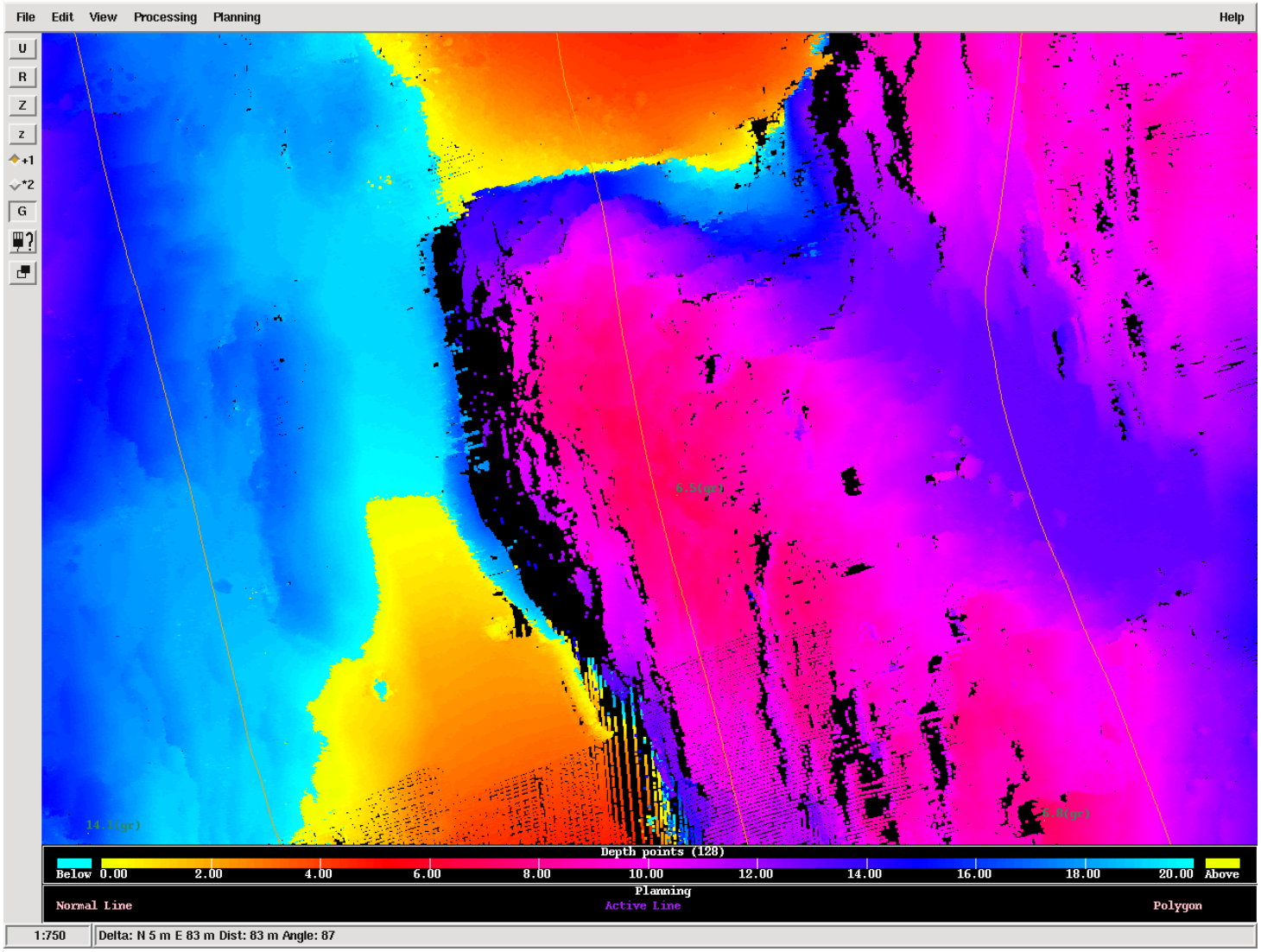
Discussions

Observations from the data


File
Edit
View
Processing
Planning
Help
U
R
Z
z
+1
*2
G
Test 2:
EM2040 – steap slope
Gap in data
17.89
17.78
22.46
38.52
Depth points (128)
Below 0.00
2.00
4.00
6.00
8.00
10.00
12.00
14.00
16.00
18.00
20.00
Above
Planning
Normal Line
Active Line
Polygon
1:354
Points: Line=0004_20111018_133711_Sjotroll Beam=48 Ping=10345 Depth=21.36m STD_V=327.67 Resid.=-0.07 F=Valid

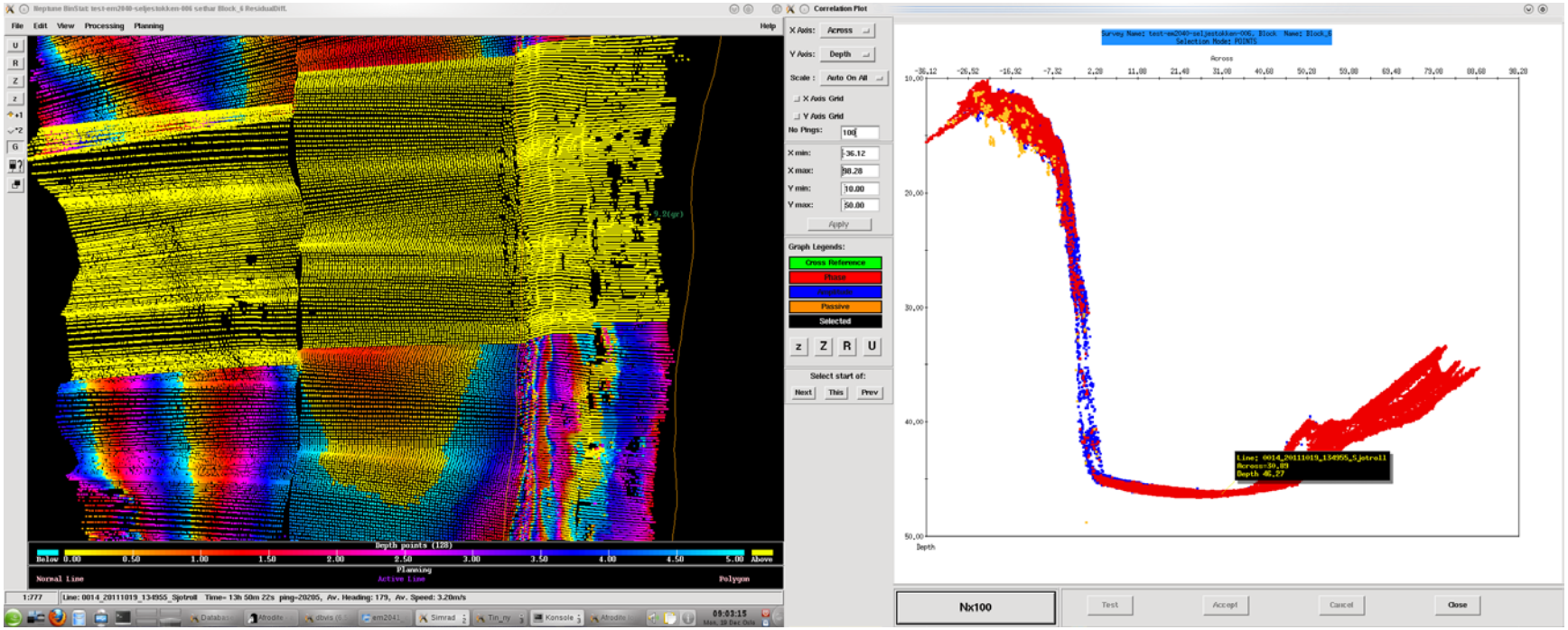
These gaps appeared more often at slopes and were larger than we had seen before.

Could it be due to certain filtersettings in SIS?



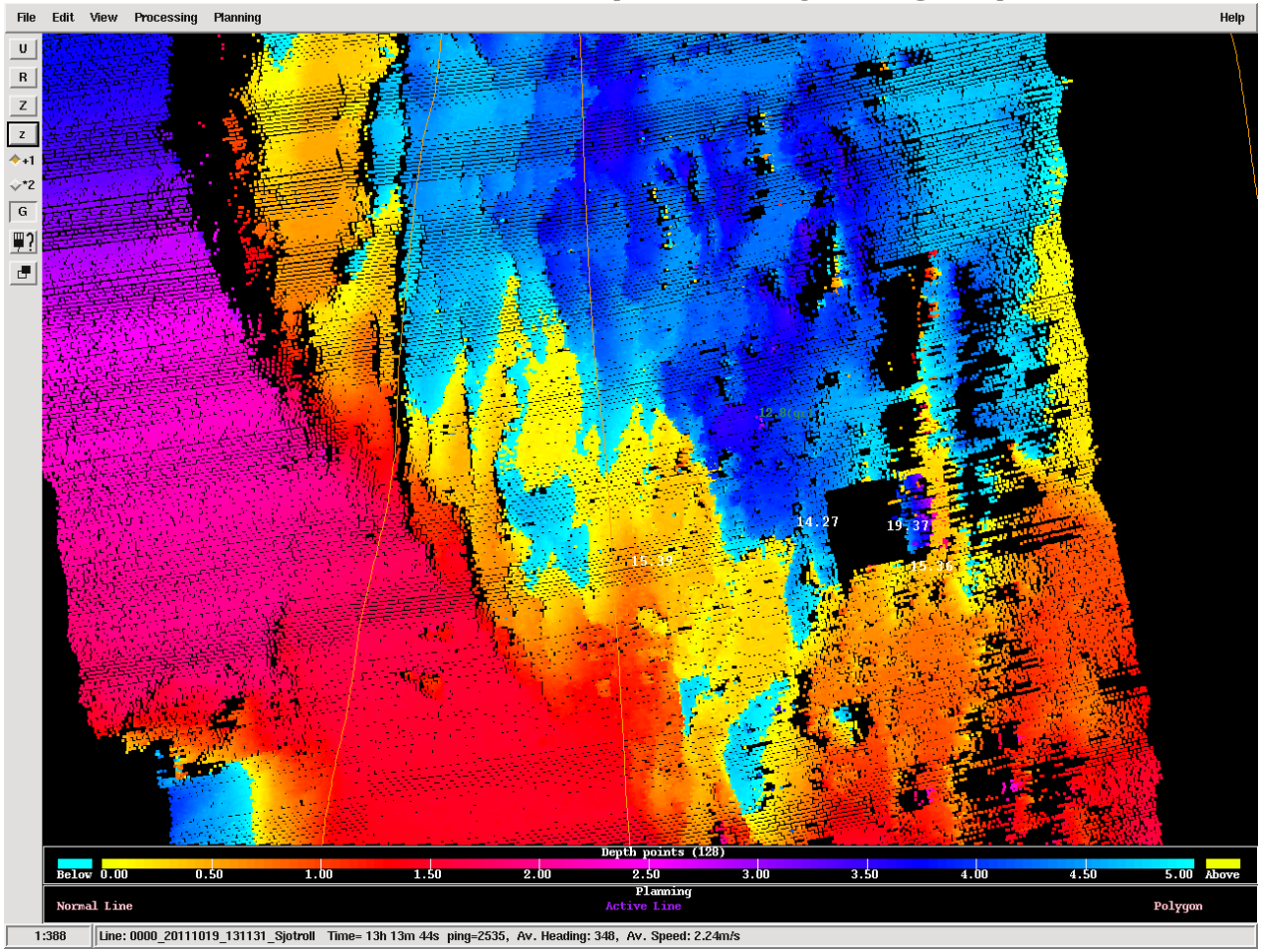
Optimal angle

Very good detection of the steap slope with perfect angle.

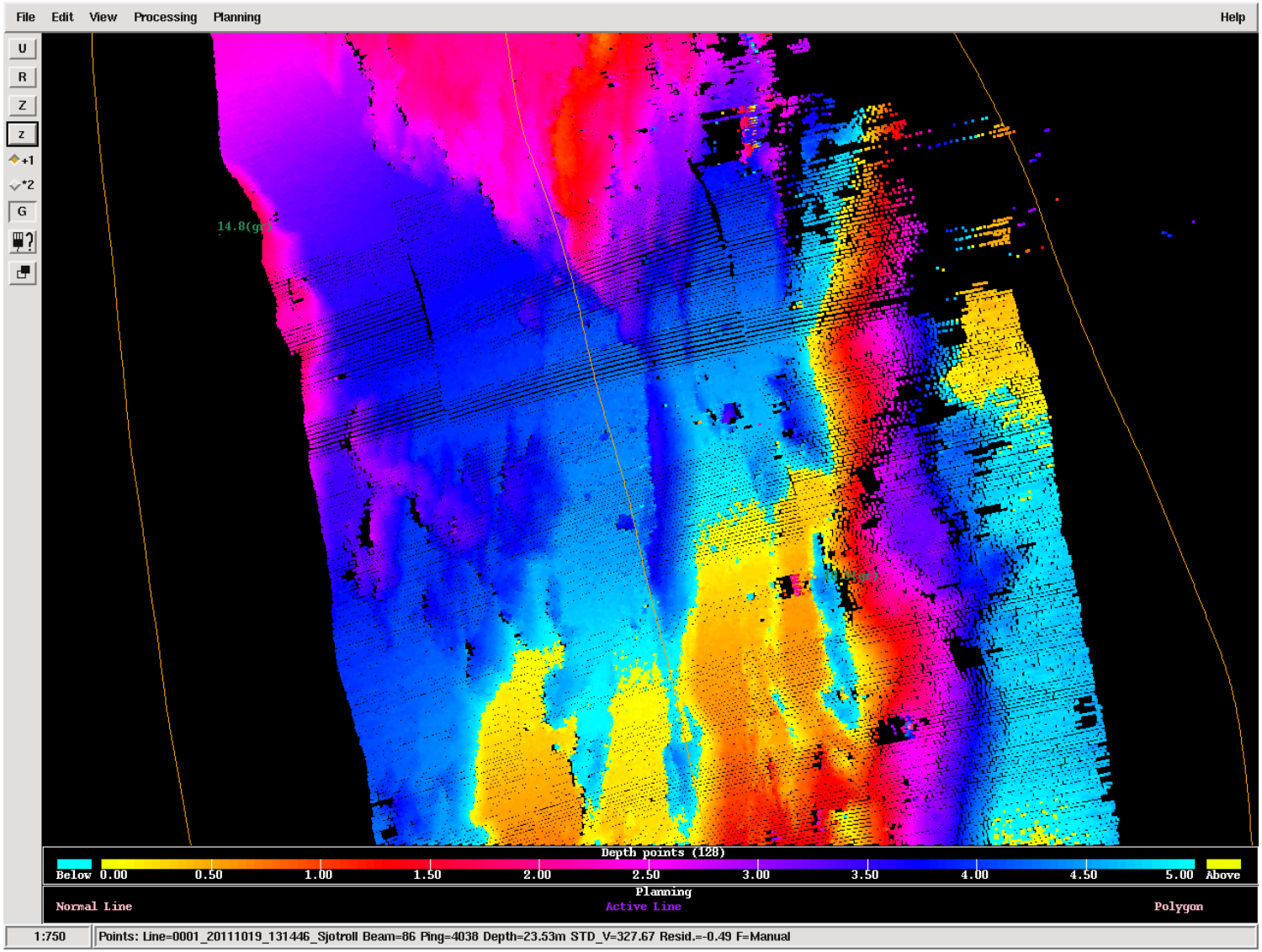


Sink holes?

Many false sink holes appeared more often than we have been used to, particularly along slopes.

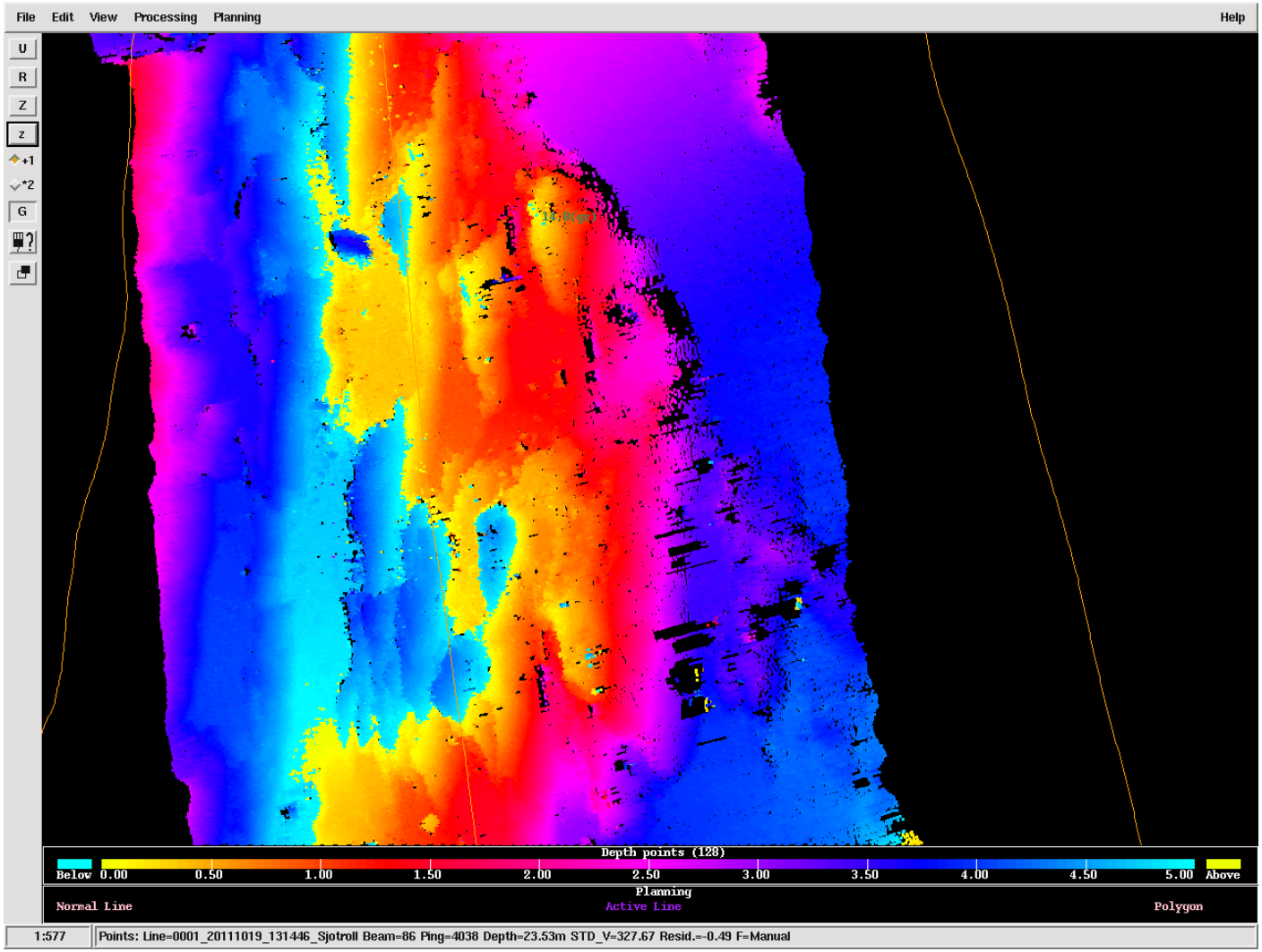


All points
Some noise and gaps during bad weather (high picthing)



EM2040

All points (nothing cleaned)



Considerations

- The number of re-runs (lines to fill in the gaps) were less than before, but not by much.
- We think that this would have been better for EM2040 during more normal pitching.
- Apart from the pitching, the positioning of the sonar (bow-mounted) might also have been an advantage for EM2040, since bubbles occur a lot more further down the hull of the vessel, which is a problem for the hull-mounted EM3002, during rough seas.
- All the tests were also repeated by another data processor with minor variations.

Thank you for your attention

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