Fast Thermistor String

… from idea to realization …

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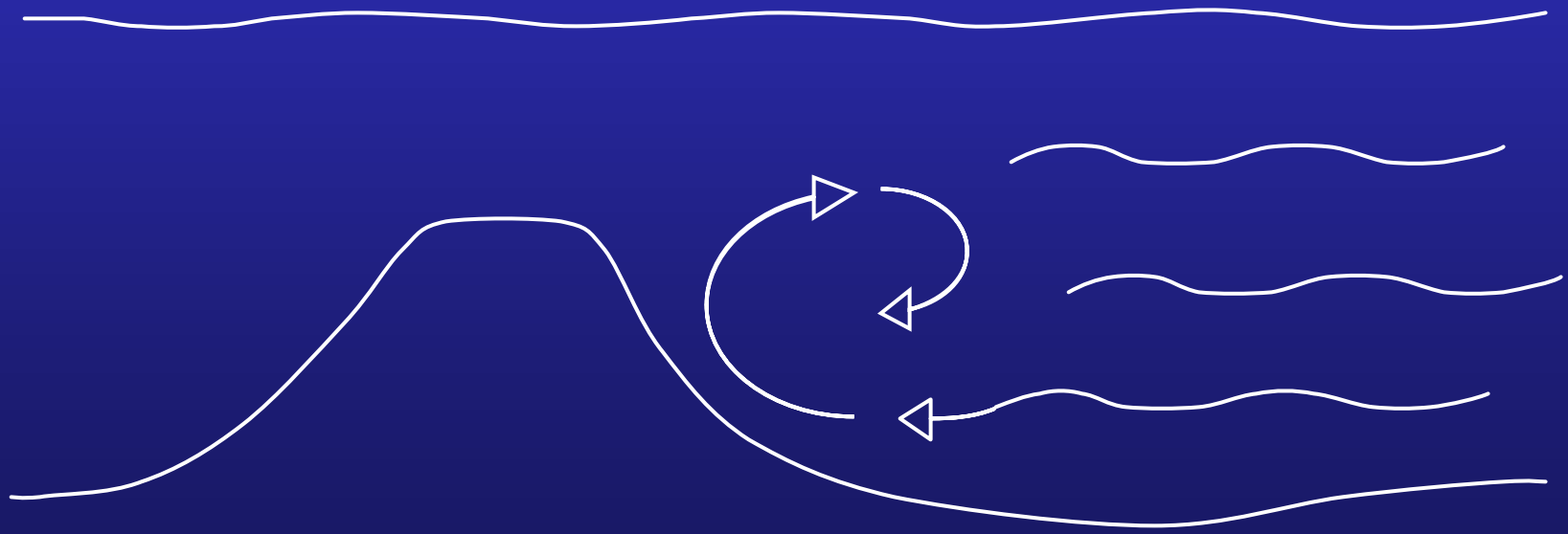
The scientific need

To accurately monitor fast and vigorous internal wave processes above sloping bottoms in the ocean.



The technical challenge

To use temperature as a tracer for moving water masses

So what do they need for this accurate monitoring?

100 sensors

Accuracy of 0.01ºC

Sampling interval ones every 10sec

Deployment 2 weeks.

The first question was:

Can we buy this somewhere?

To be short

the answer was: NO

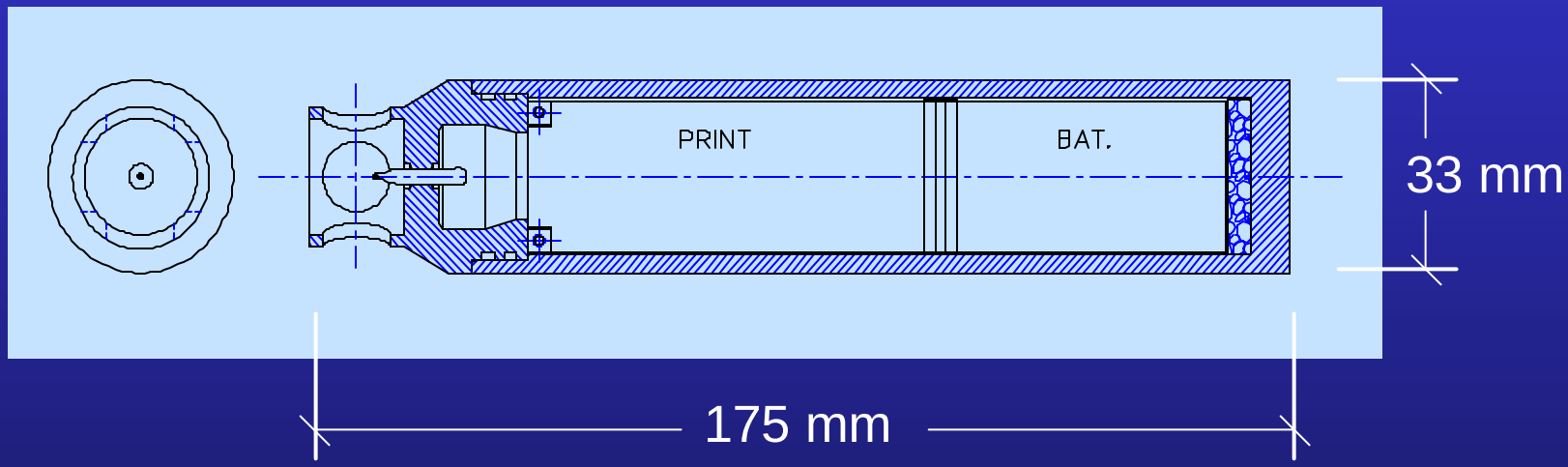
Not in these specifications

The second question was:

Can we make this ourselves?

And this was the beginning of
the NIOZ “ Fast Thermistorstring “
now some 10 years ago

Currently we are at model 3.



What happened with model 1 and 2

To be short again

Model 1 had 32 sensors and worked perfectly but got lost at sea.

Model 2 had 128 sensors and worked accurate but had a lot of problems. Leakage, cable failure, unreliable

Model 3

No cables

No leakage

Robust housing.

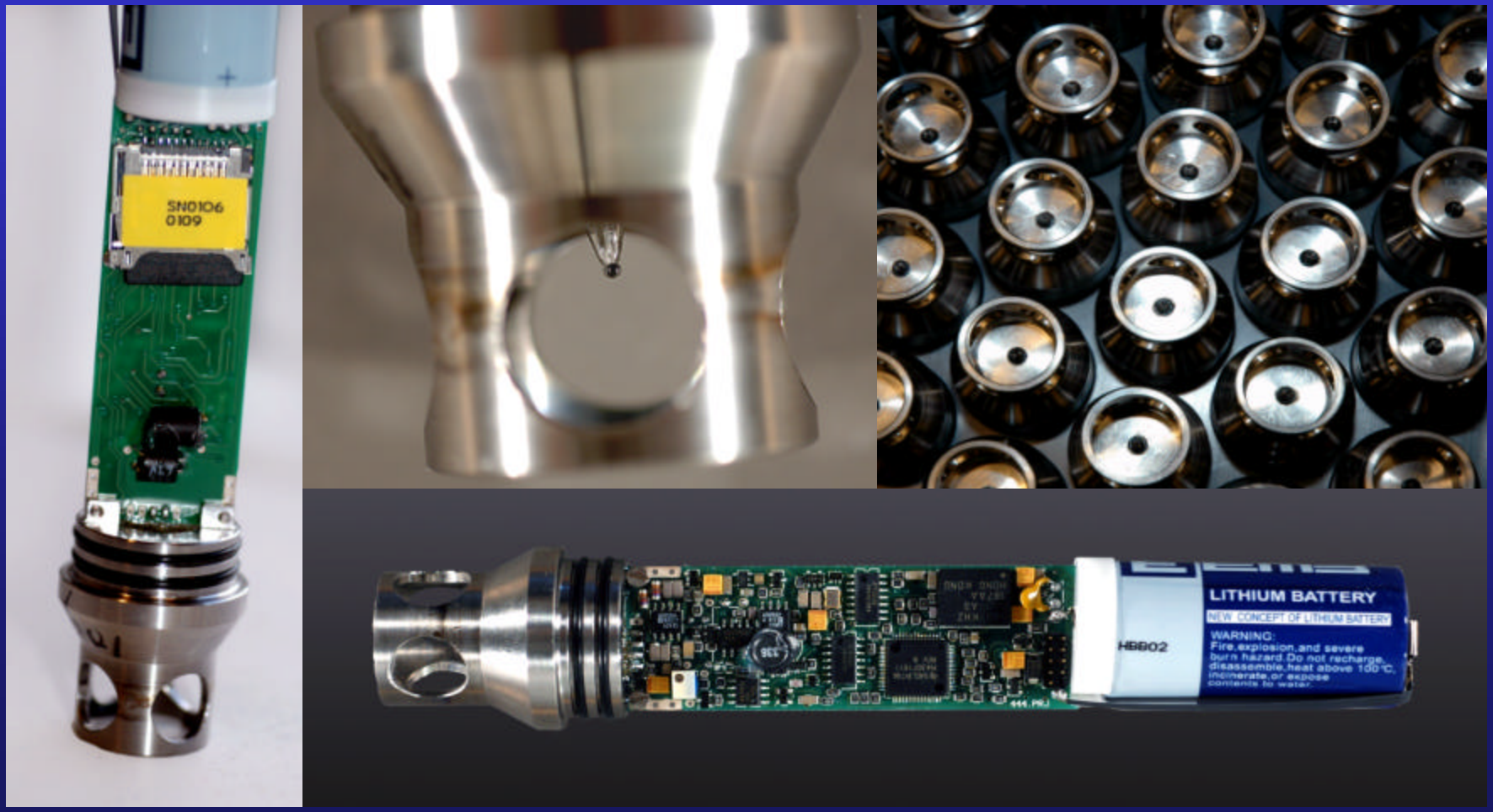
Variable sensor spacing

Local data storage

Power supply up to 2 years.

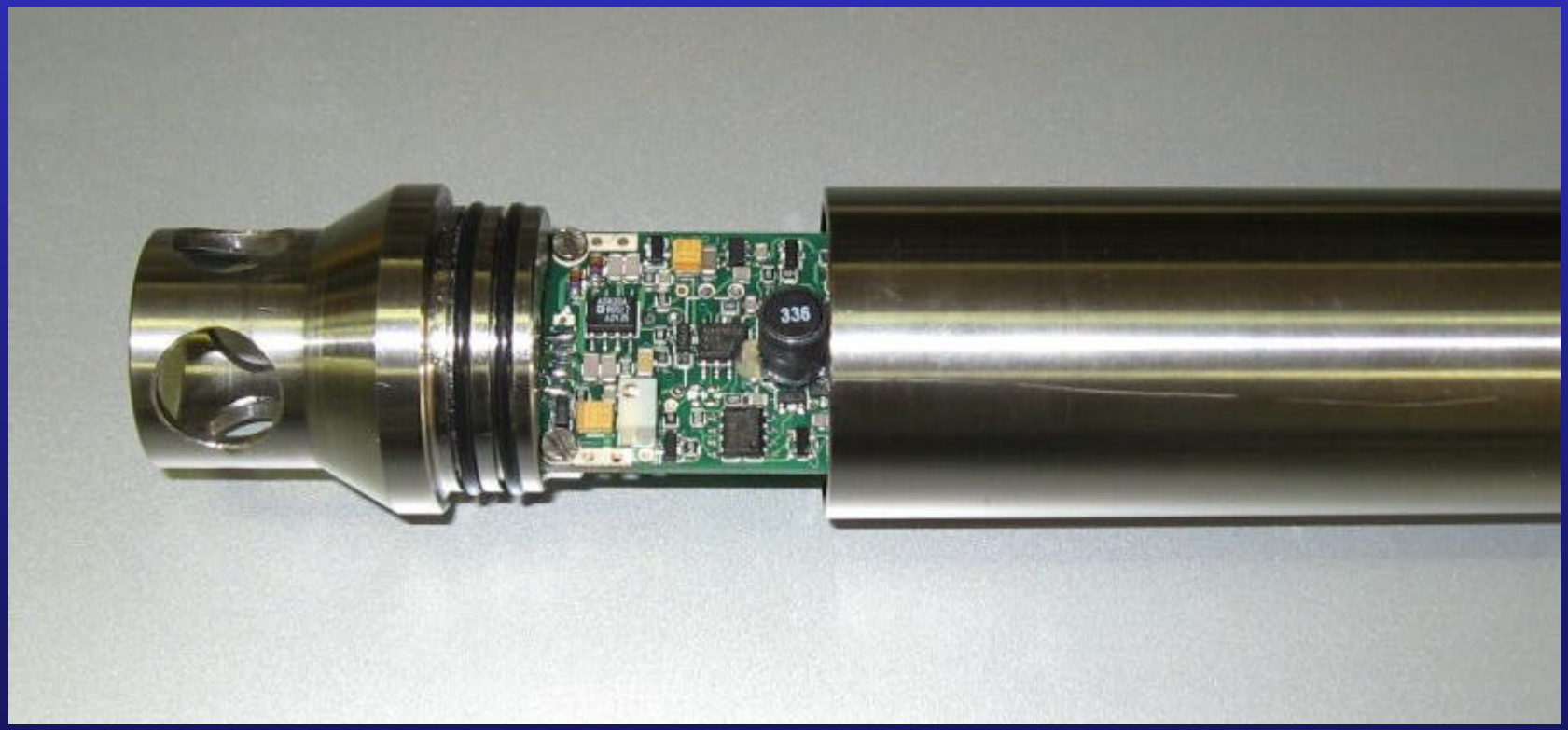
Freely programmable.

Model 3 in detail



Some features

No nuts and bolts

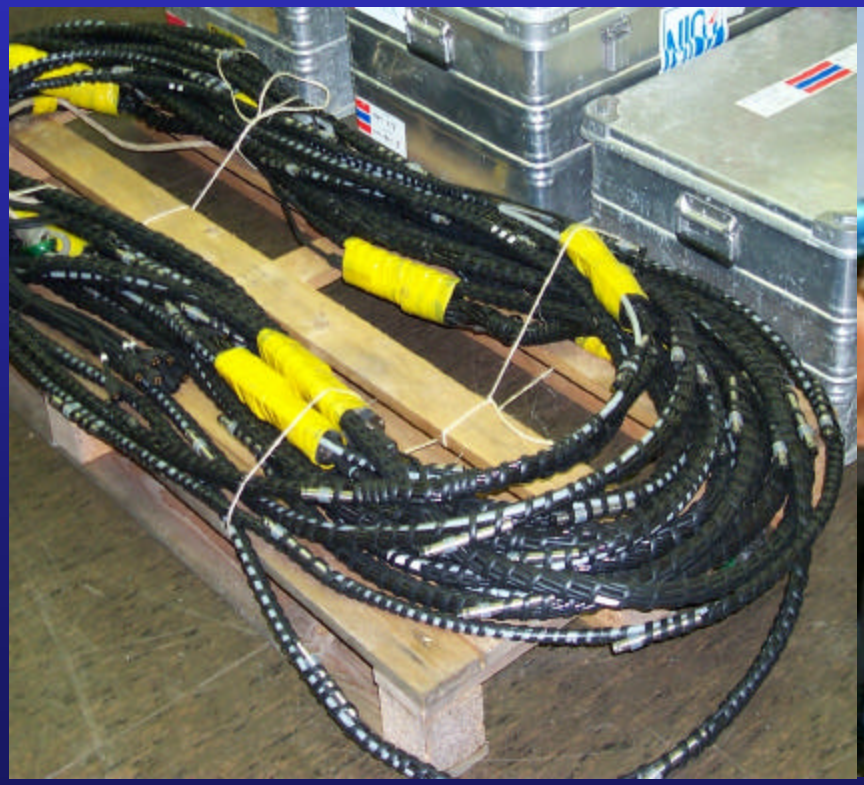


Some features

No connecting electrical cable

Some features

Variable sensor spacing

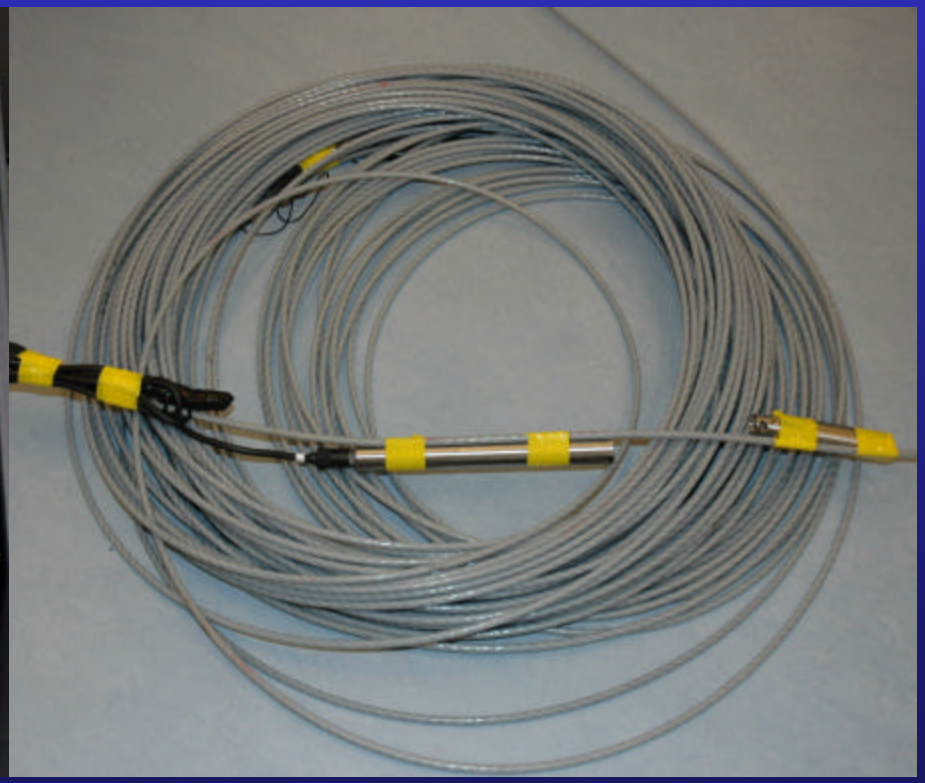


Some features

Simultaneous programming

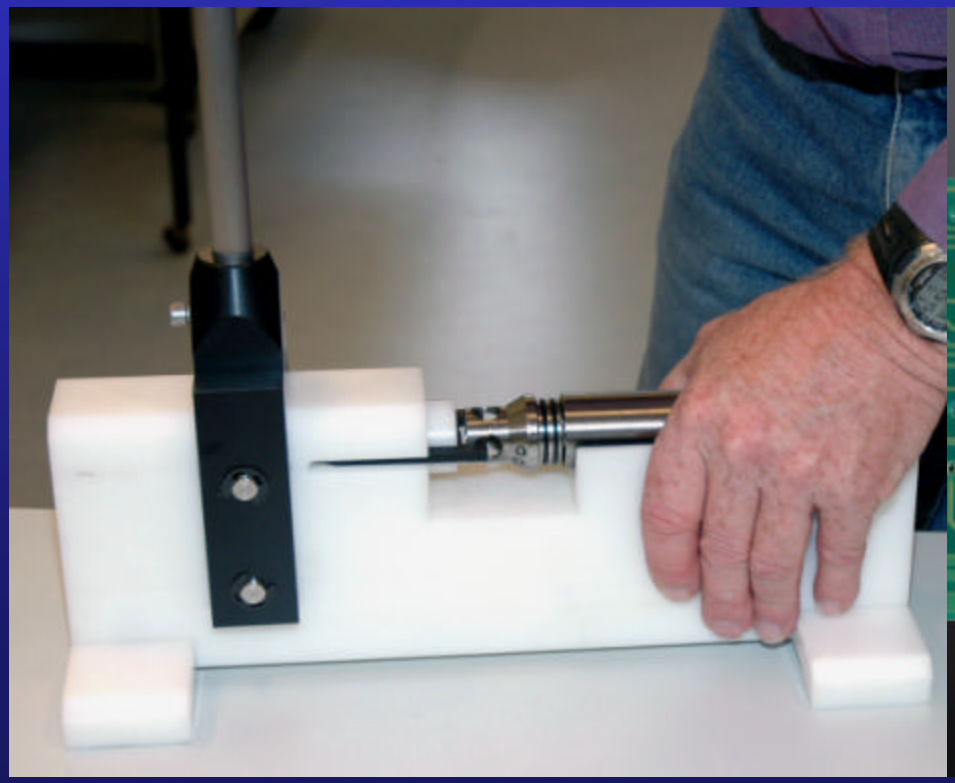
Some features

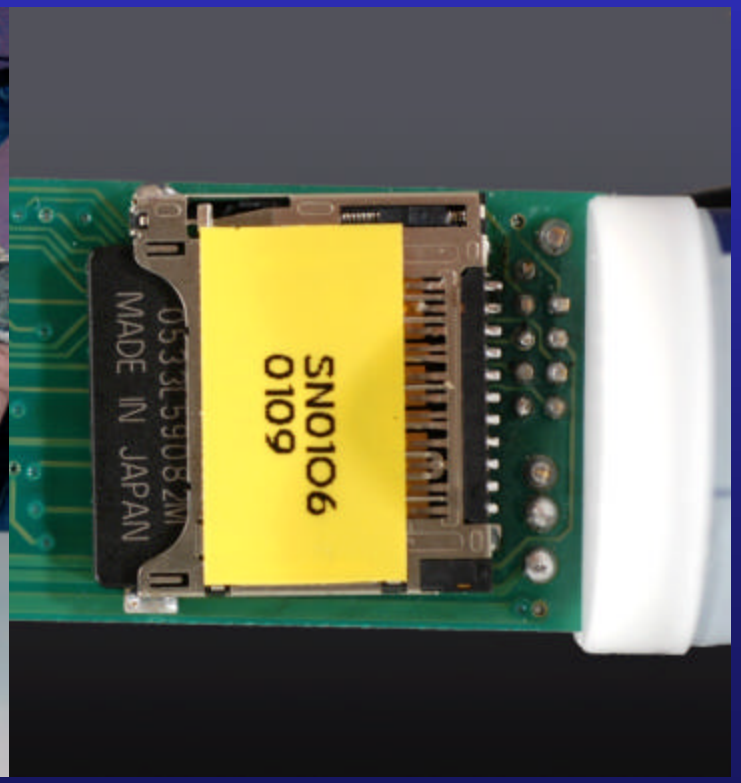
Internal clock synchronization



Some features

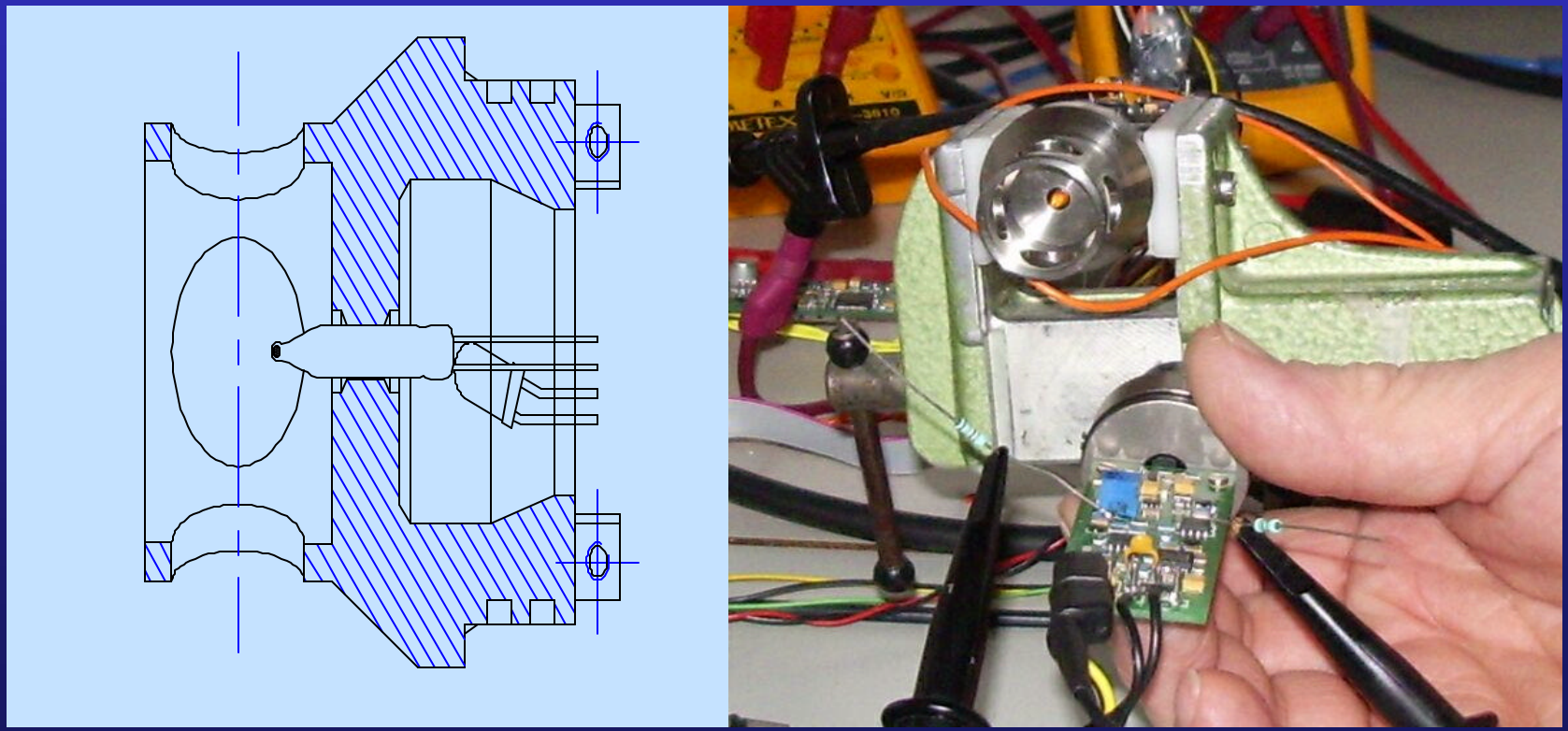
Local data storage





Some features

Optical readout



Some features

Optical readout

Model 3 the specs.

Number of sensors	Free
String length	200 m
Depth rating	6000 m
Range (T)	-2 .. 50 °C
Accuracy	1.5 mK
Signal to noise ratio	0.1 mK
Response time (?)	<0.25 s
Sampling interval	1 s
Memory+battery life	2 years
Data capacity	60 million

Model 3 the specs. compared to initial demands

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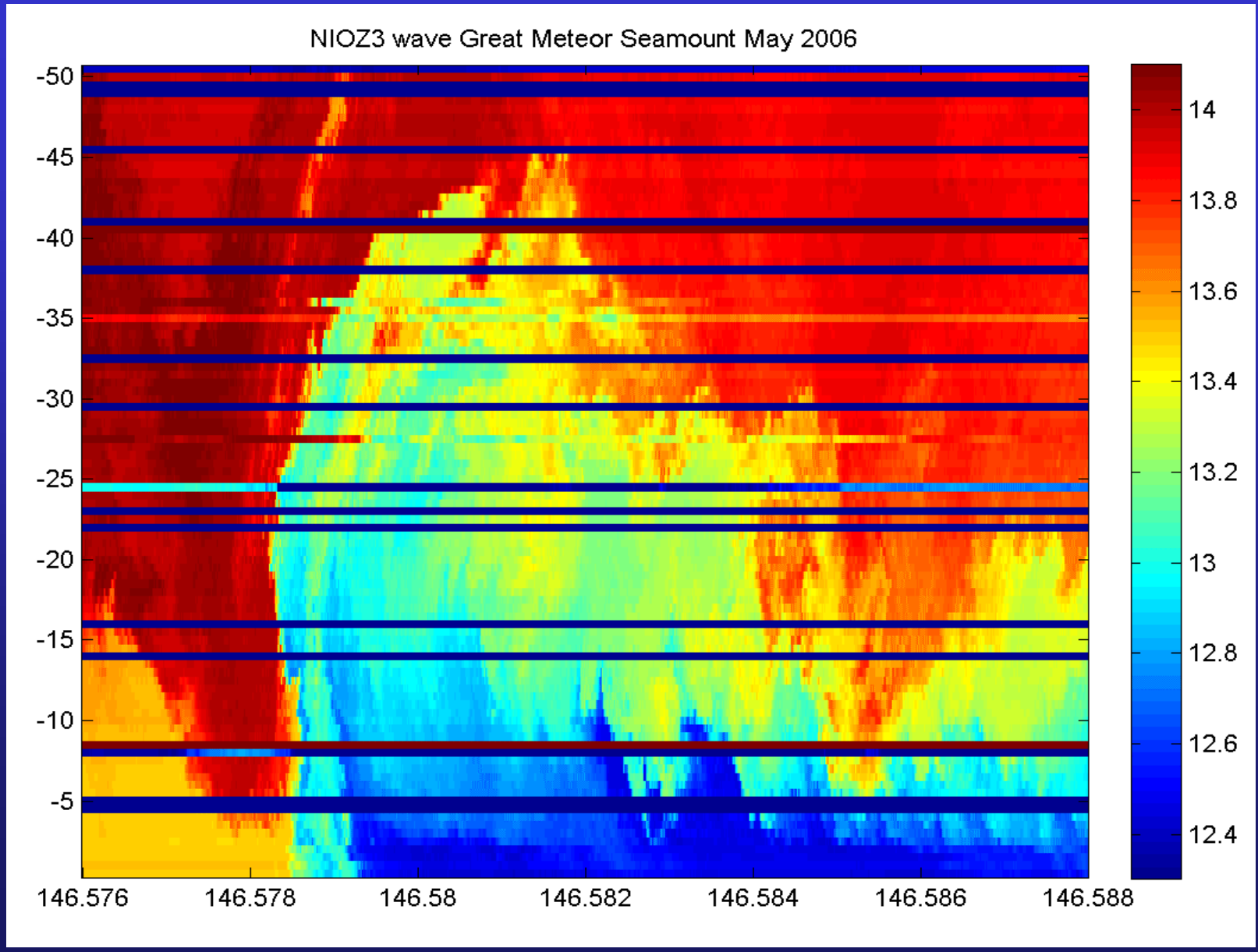
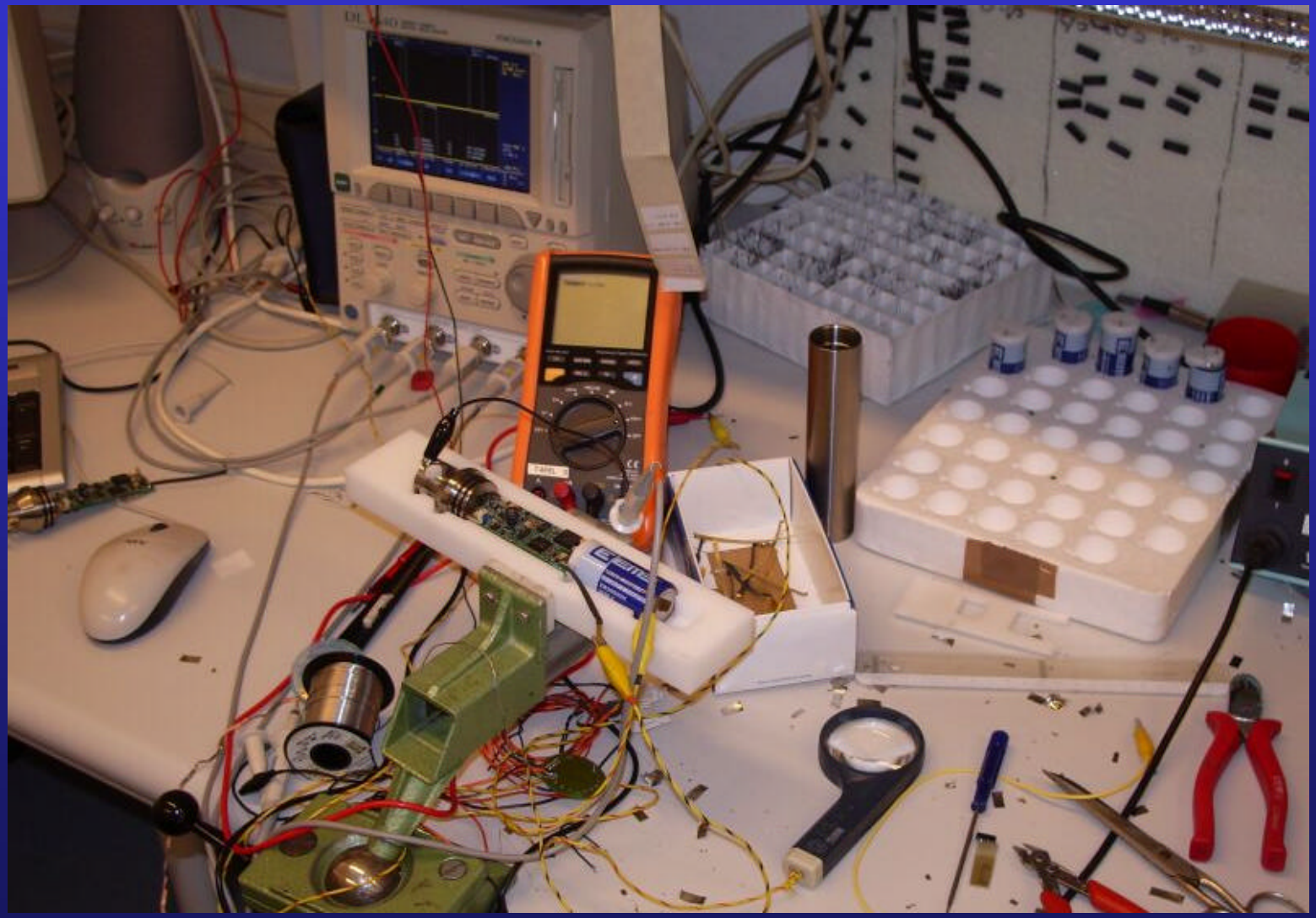
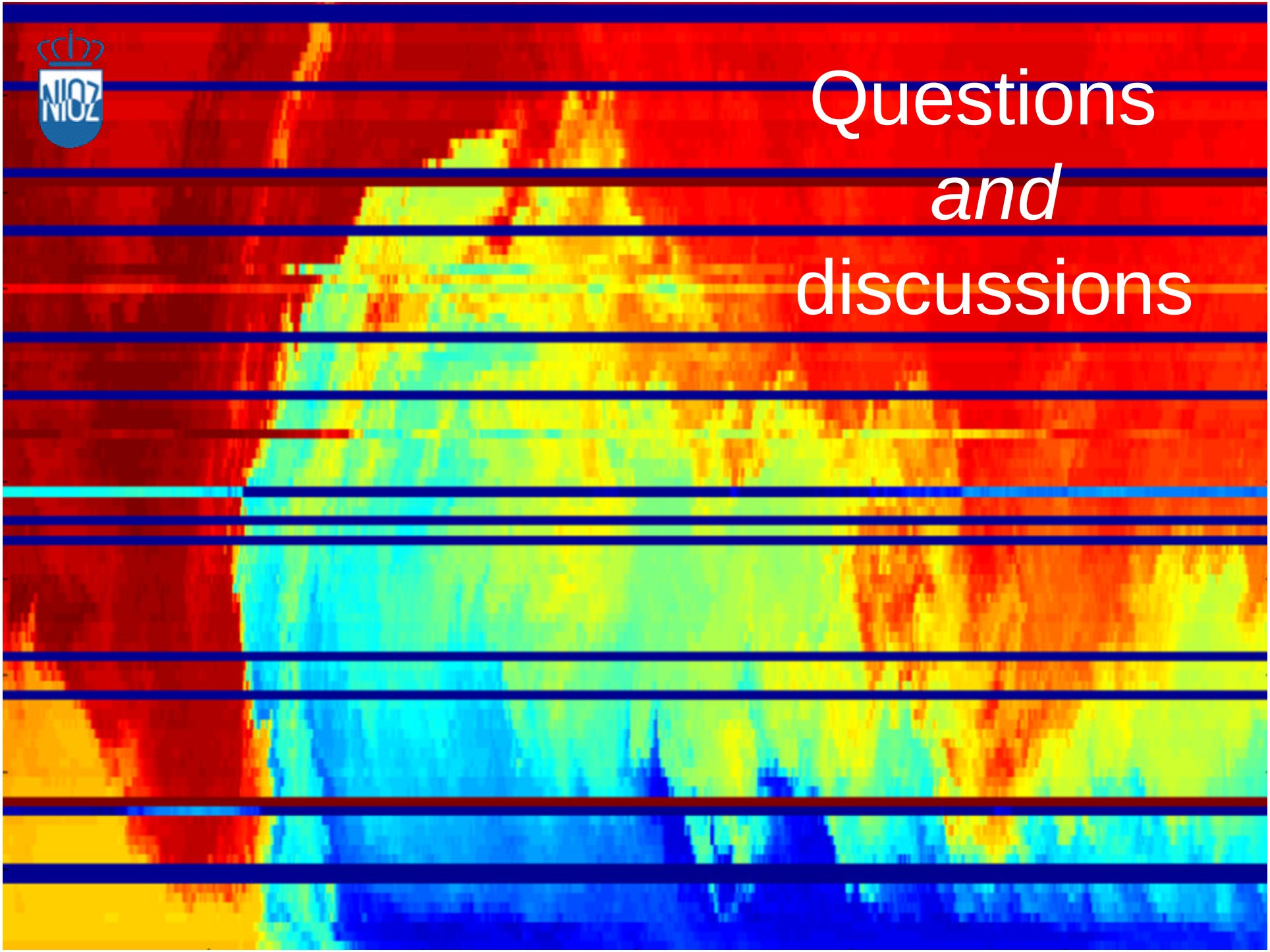
-100 sensors
-Accuracy of 0.01ºC
-Sampling interval
once every 10 sec.
-Deployment time
of 2 weeks.


NIOZ3 wave Great Meteor Seamount May 2006
-50
-45
-40
-35
-30
-25
-20
-15
-10
-5
146.576
146.578
146.58
146.582
146.584
146.586
146.588
14
13.8
13.6
13.4
13.2
13
12.8
12.6
12.4

Limited testing time




Questions
and
discussions