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by

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Shallow water tomography for internal tide estimation: preliminary results of INTIMATE'96.

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INTIMATE Partnership

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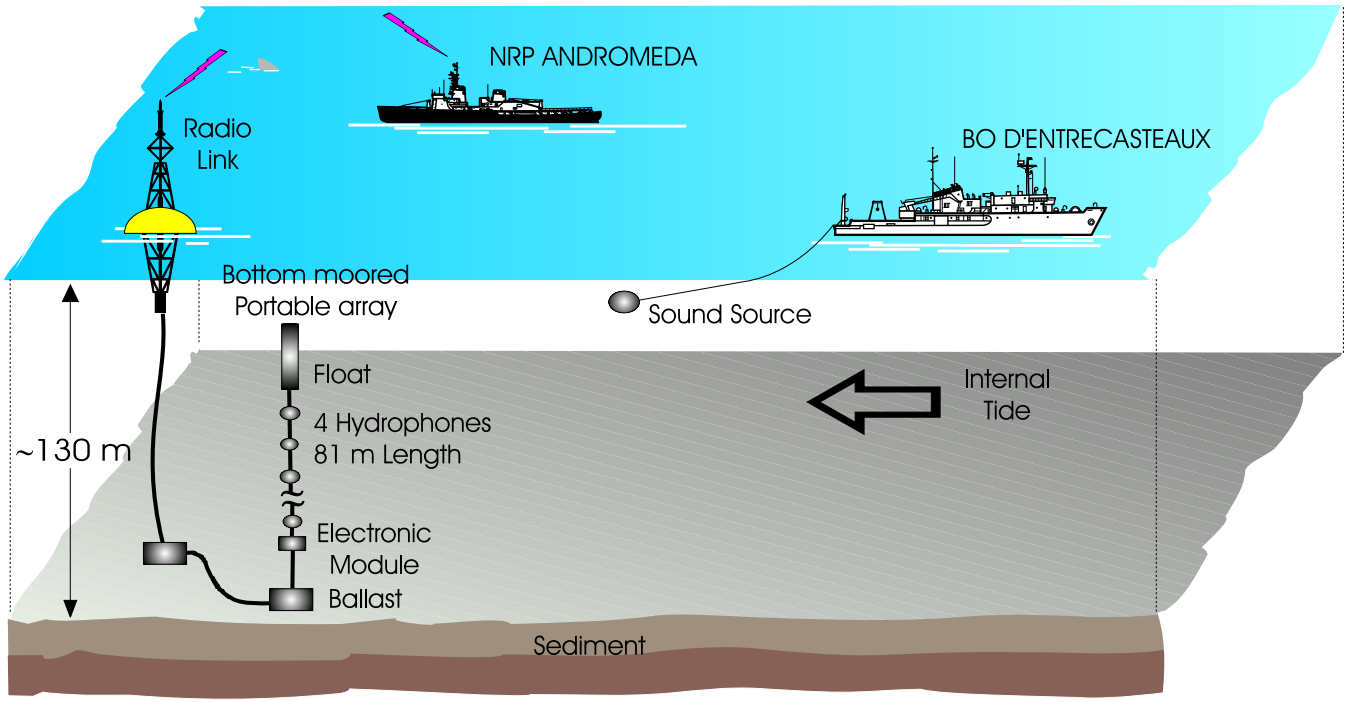
Internal **TI**de **M**easurement with **A**coustic **T**omography **E**xperiments
(**INTIMATE**)

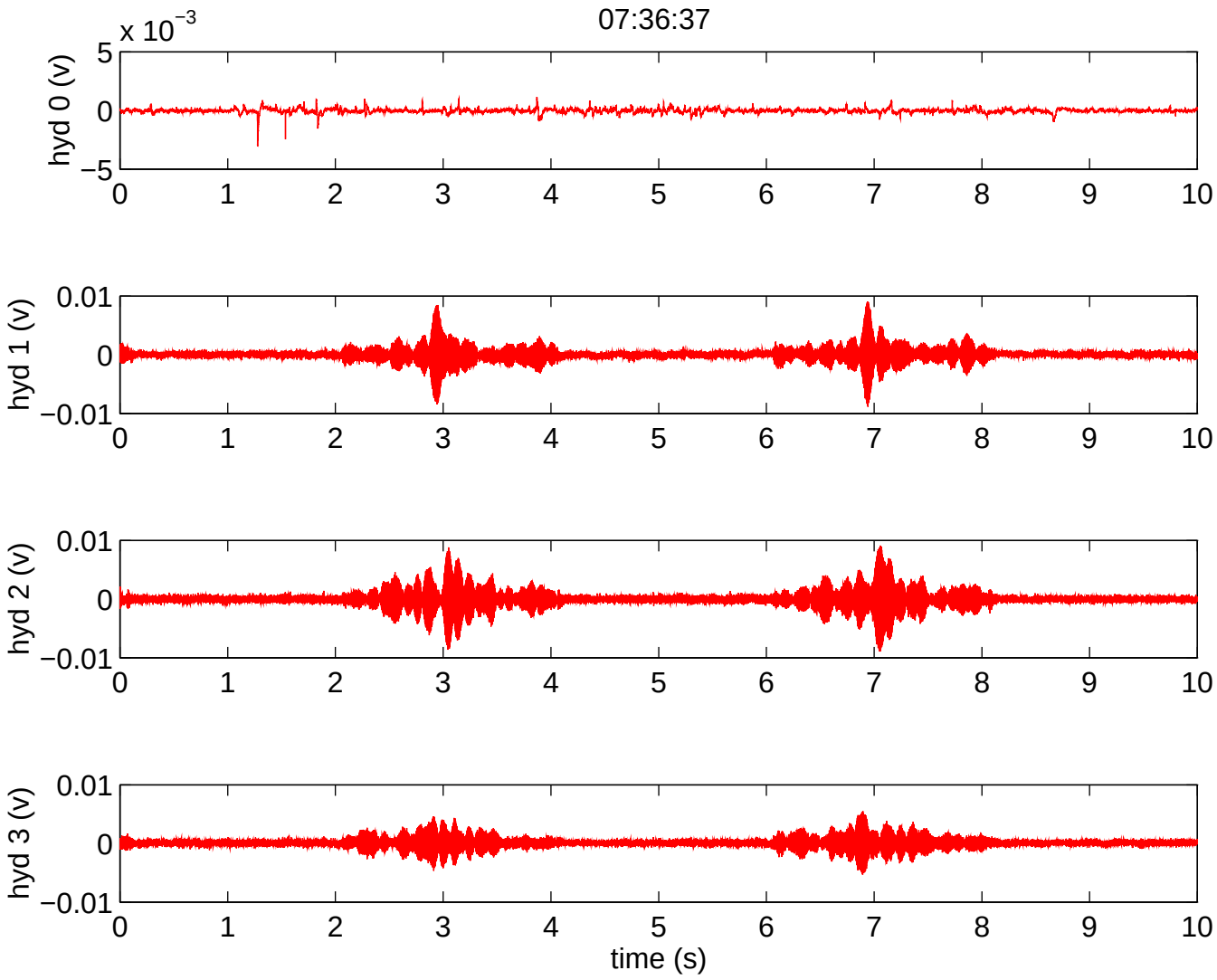
Objectives

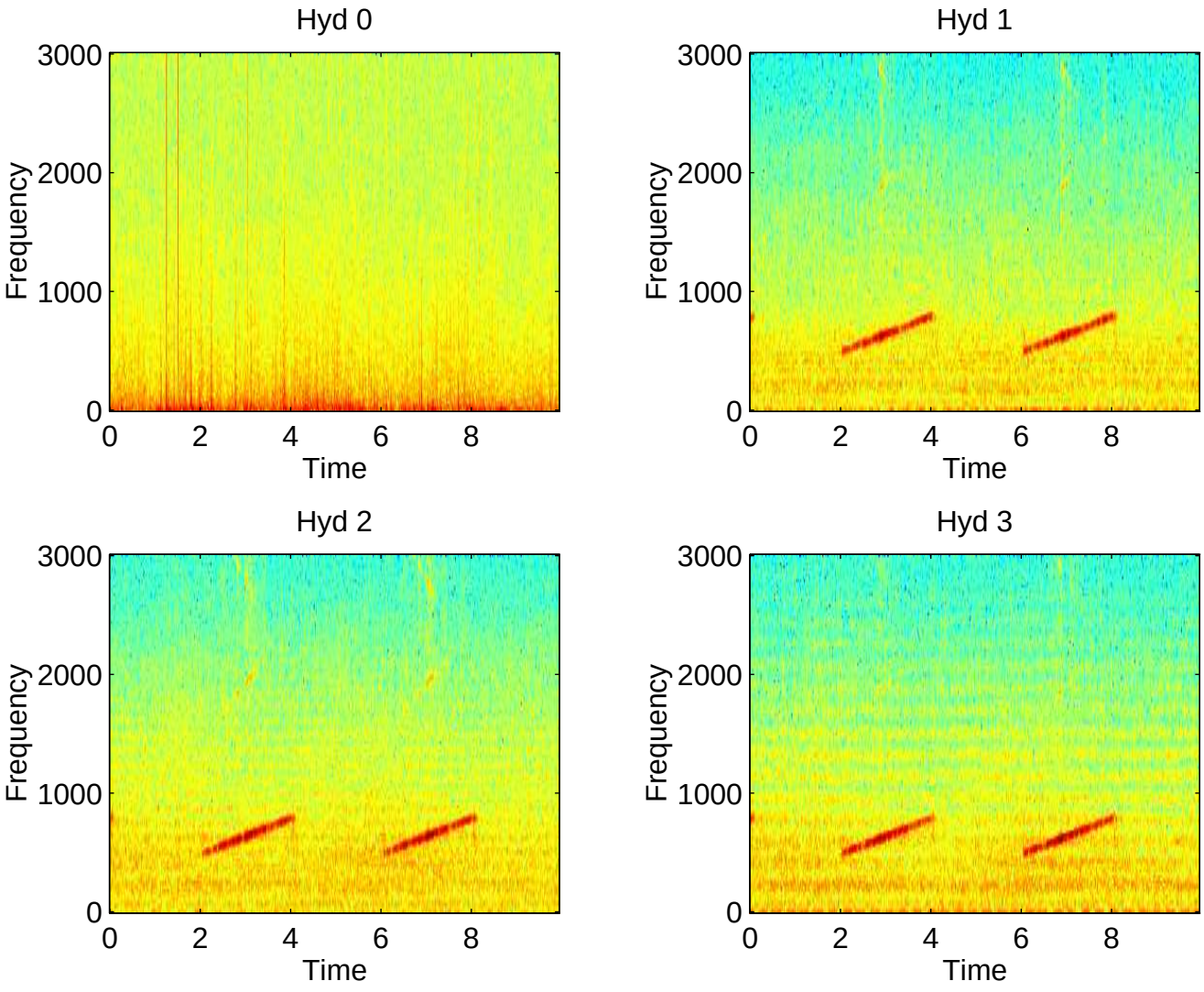
- to establish the capabilities of acoustic tomography
  for estimating internal tide parameters in shallow water

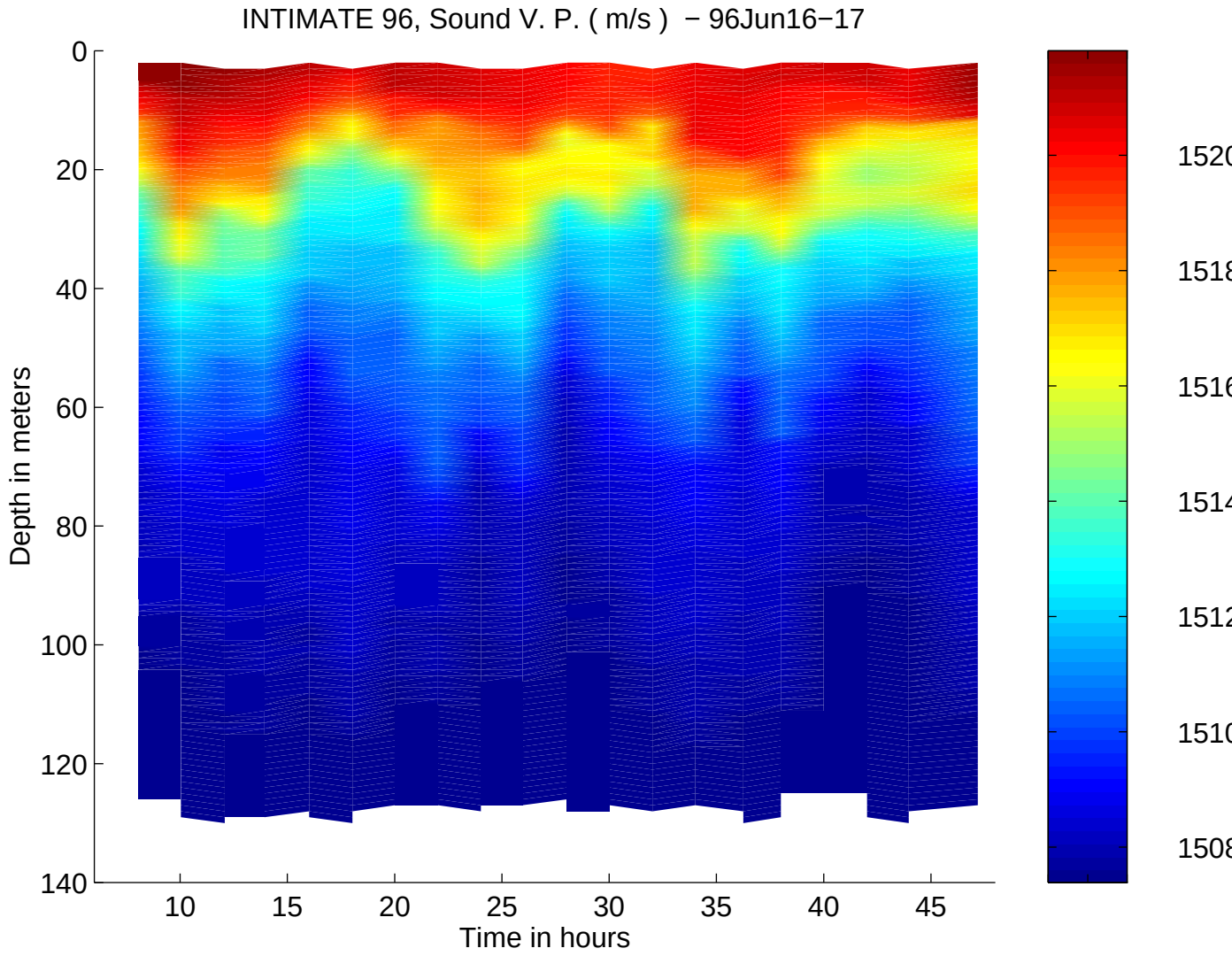
- design experimental equipment and methodologies
  for inverting acoustic data in shallow water

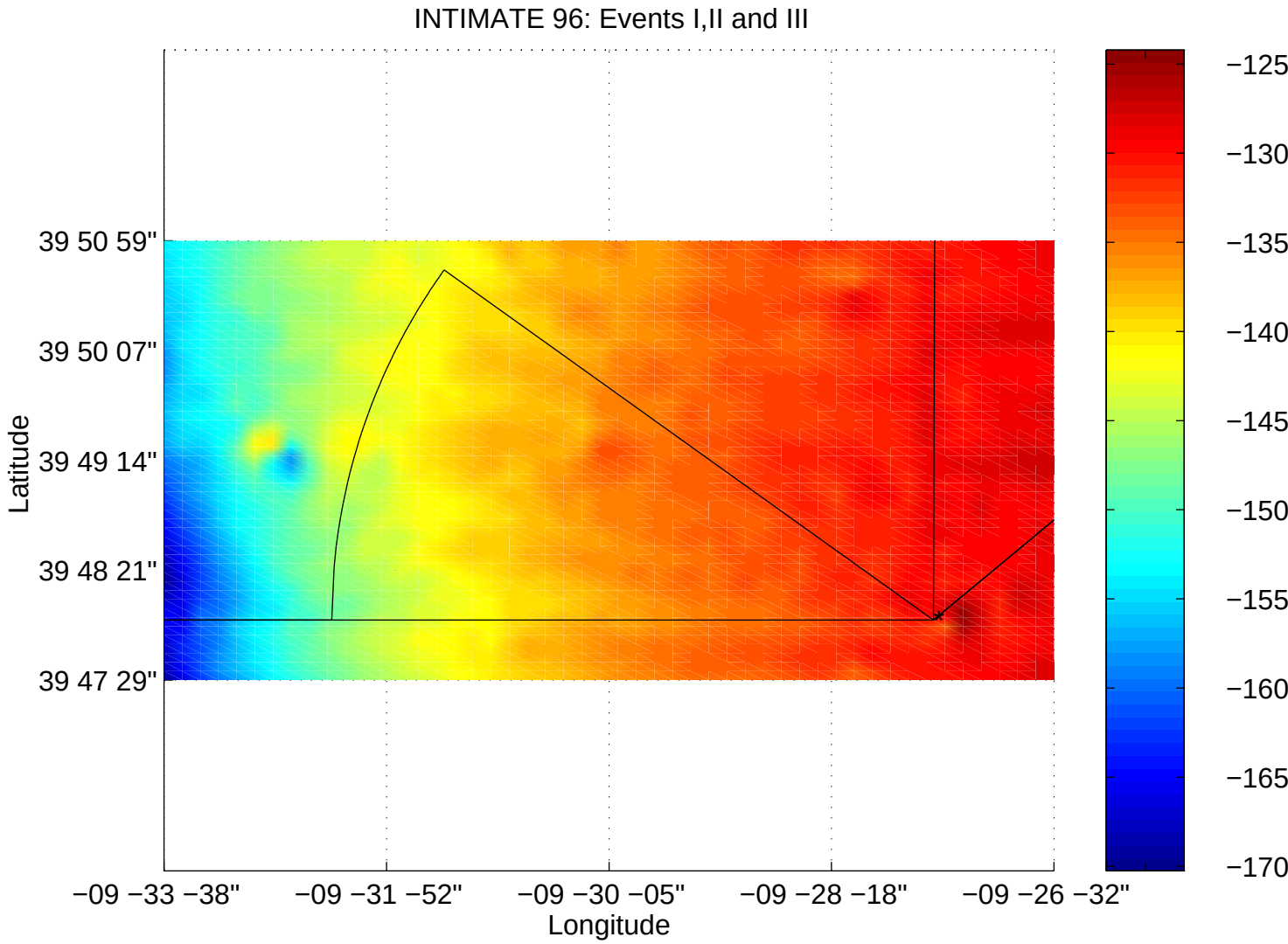
Real Data Acquisition Scenario
INTIMATE'96, JUN 1996 - NW Nazaré site

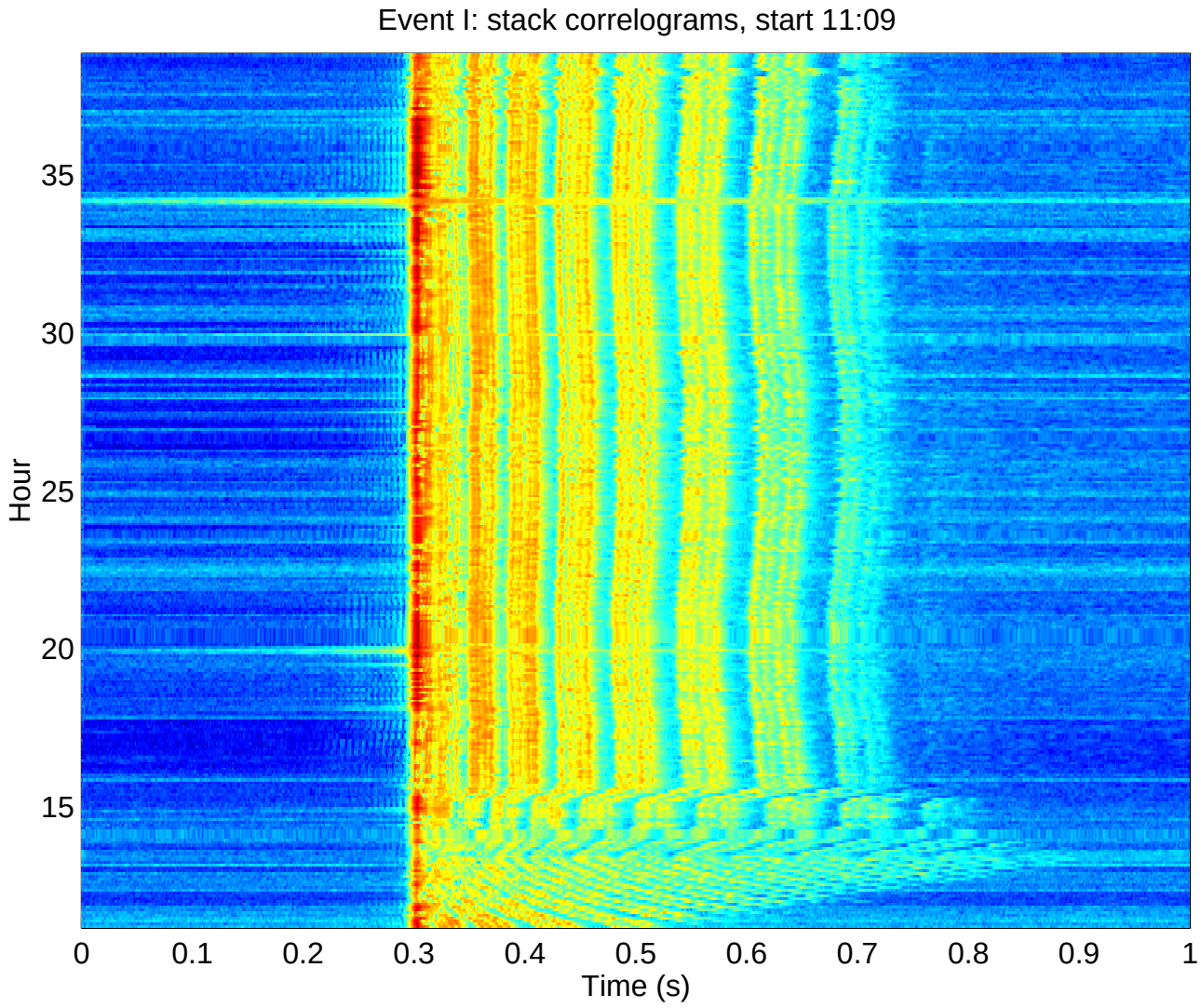


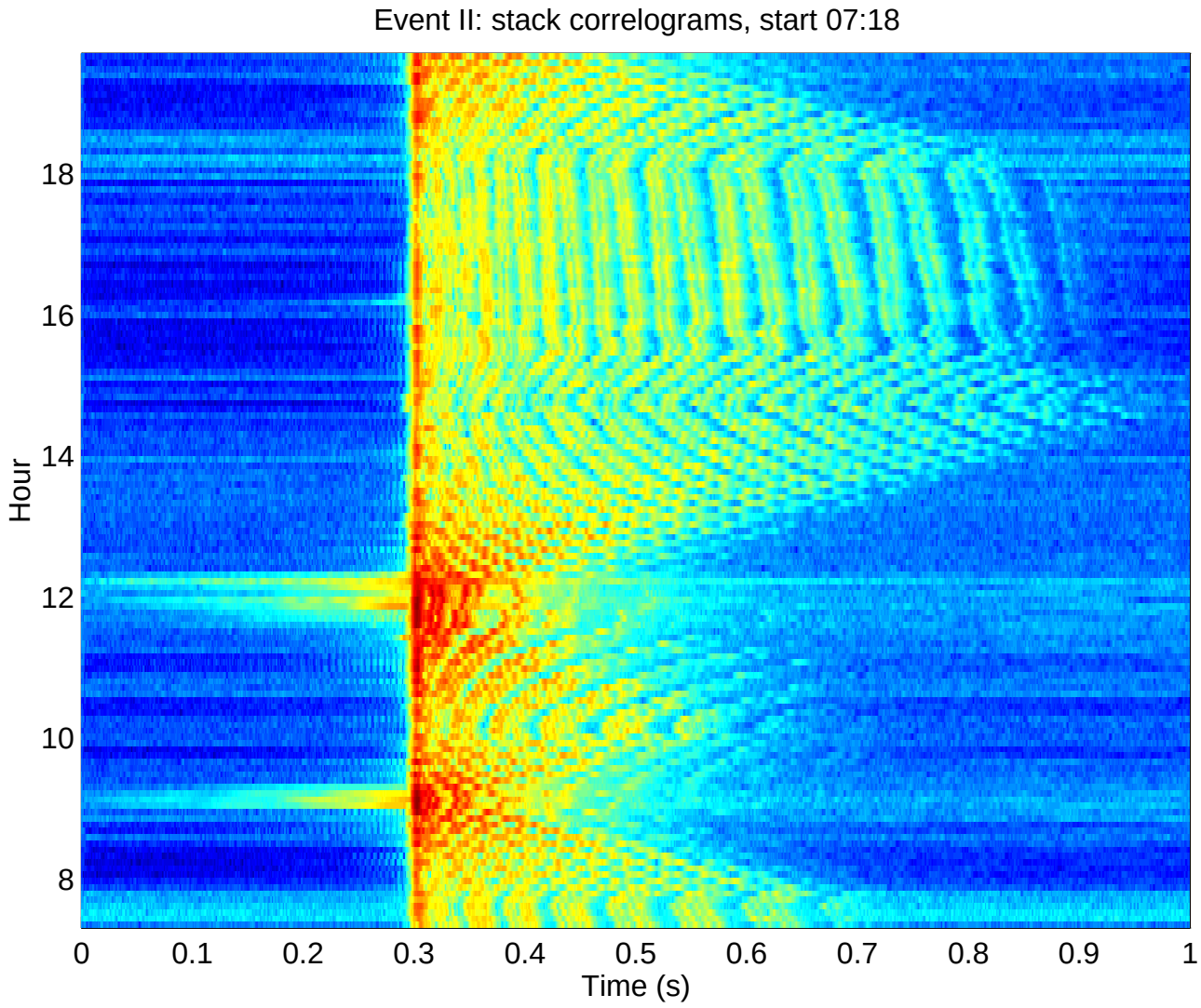

07:36:37
x 10^-3
hyd 0 (v)
5
0
−5
hyd 1 (v)
0.01
0
−0.01
hyd 2 (v)
hyd 3 (v)
0 1 2 3 4 5 6 7 8 9 10
time (s)

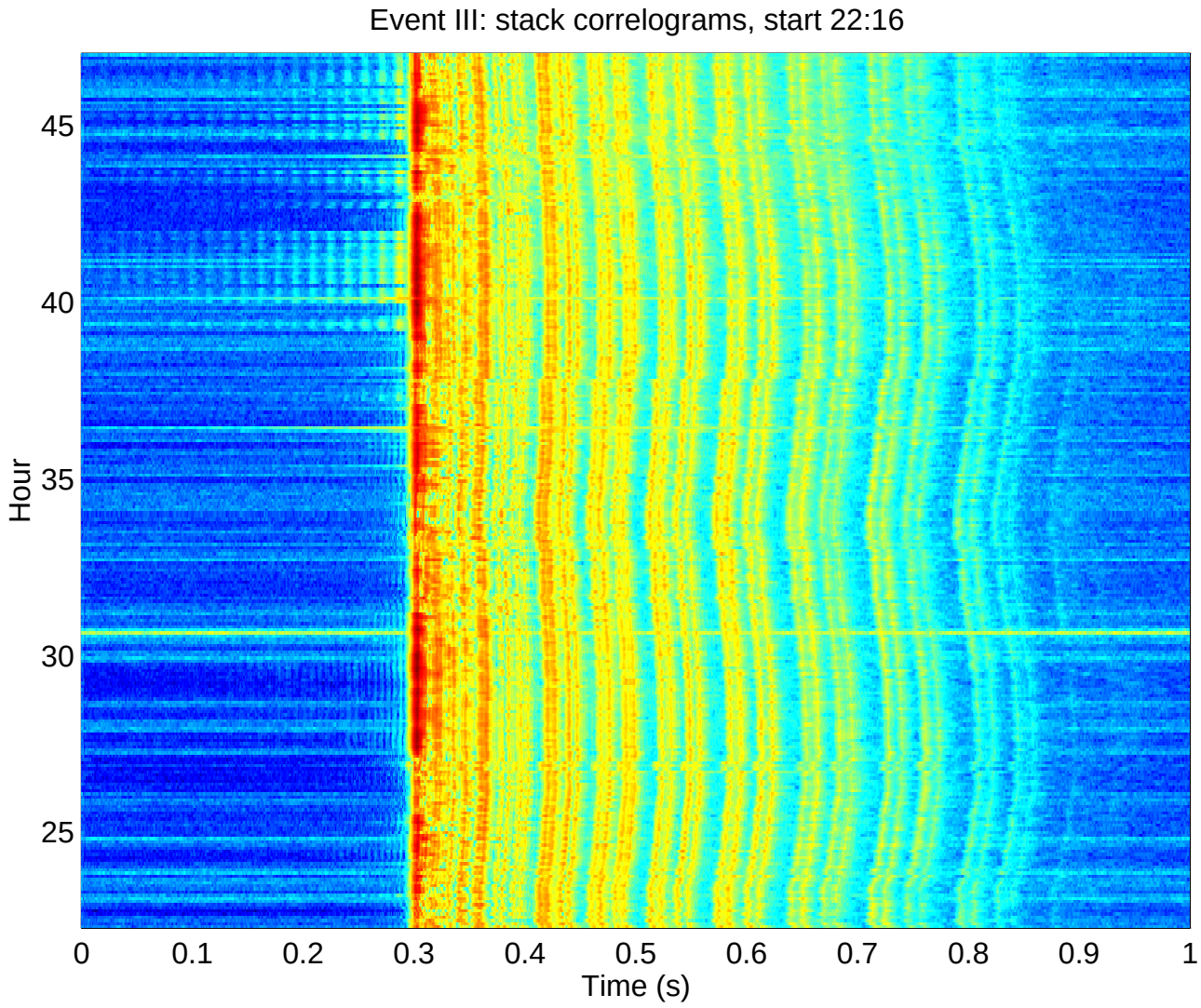

Hyd 0
Hyd 1
Hyd 2
Hyd 3
Frequency
Time
0
1000
2000
3000
0
2
4
6
8

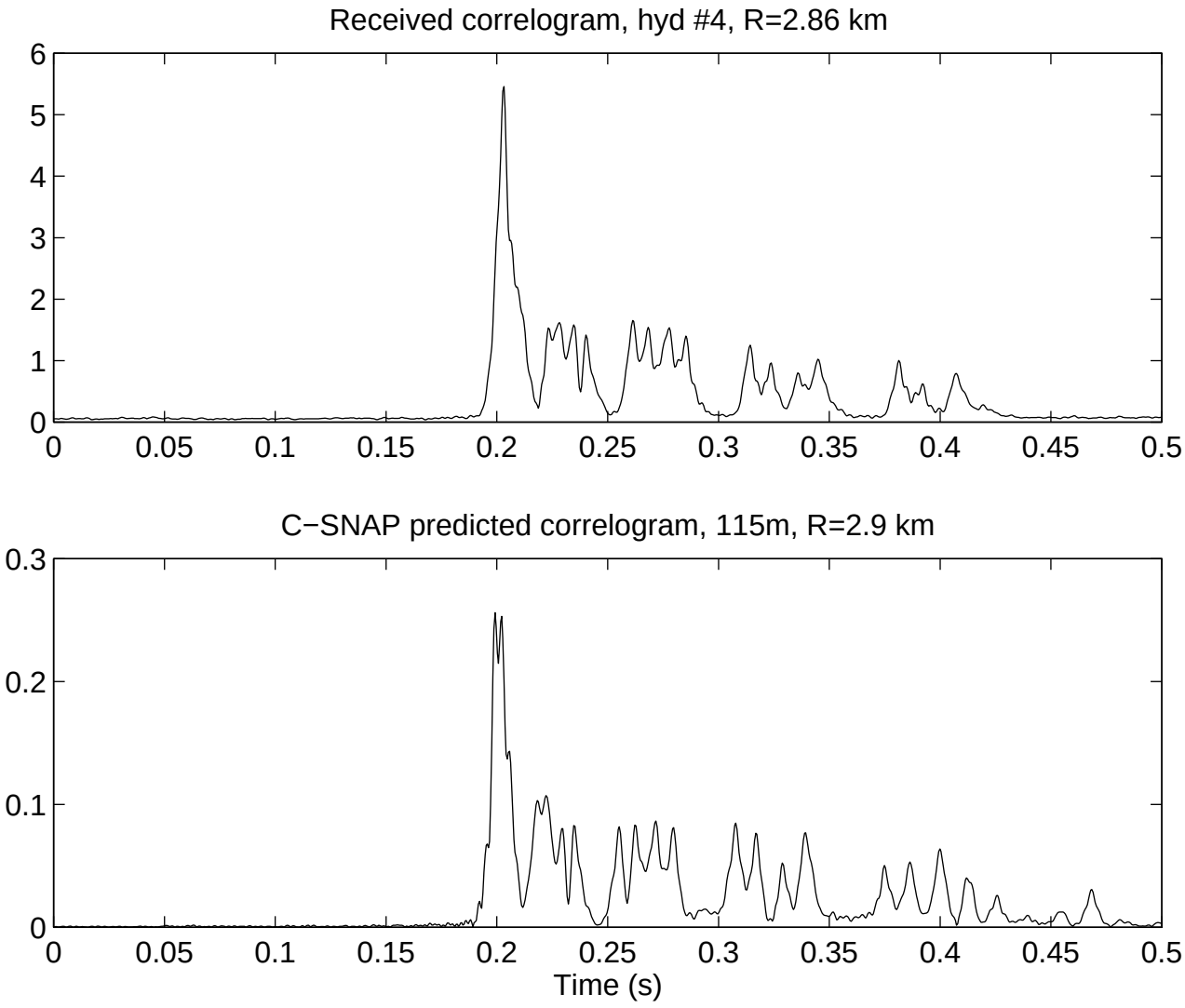

INTIMATE 96, Sound V. P. (m/s) − 96Jun16−17
Depth in meters
0
20
40
60
80
100
120
140
10
15
20
25
30
35
40
45
Time in hours
1520
1518
1516
1514
1512
1510
1508


INTIMATE 96: Events I,II and III
Latitude
39 50 59"
39 50 07"
39 49 14"
39 48 21"
39 47 29"
−09 −33 −38"
−09 −31 −52"
−09 −30 −05"
−09 −28 −18"
−09 −26 −32"
Longitude
−125
−130
−135
−140
−145
−150
−155
−160
−165
−170


Event I: stack correlograms, start 11:09
Hour
35
30
25
20
15
0
0.1
0.2
0.3
0.4
0.5
0.6
0.7
0.8
0.9
1
Time (s)


Event II: stack correlograms, start 07:18
Hour
18
16
14
12
10
8
0
0.1
0.2
0.3
0.4
0.5
0.6
0.7
0.8
0.9
1
Time (s)


Event III: stack correlograms, start 22:16
Hour
45
40
35
30
25
0
0.1
0.2
0.3
0.4
0.5
0.6
0.7
0.8
0.9
1
Time (s)


Received correlogram, hyd #4, R=2.86 km
6
5
4
3
2
1
0
0
0.05
0.1
0.15
0.2
0.25
0.3
0.35
0.4
0.45
0.5
C−SNAP predicted correlogram, 115m, R=2.9 km
0.3
0.2
0.1
0
0
0.05
0.1
0.15
0.2
0.25
0.3
0.35
0.4
0.45
0.5
Time (s)

Conclusions

- very stable propagation path
- high correlation with model predictions
- data set with potential for source localization, geophysical inversion and oceanographic tomography