Coastal Measurements vs. ALADIN

From:

Jericevic, Spoler Canic, Tomsic, Zibrat, Kraljevic & Grisogono:

Sodar and radio sounding measurements at Zadar, Croatia

(Book of Extended Abstracts, ICAMAP 2005, Zadar, 23-27/05/2005)

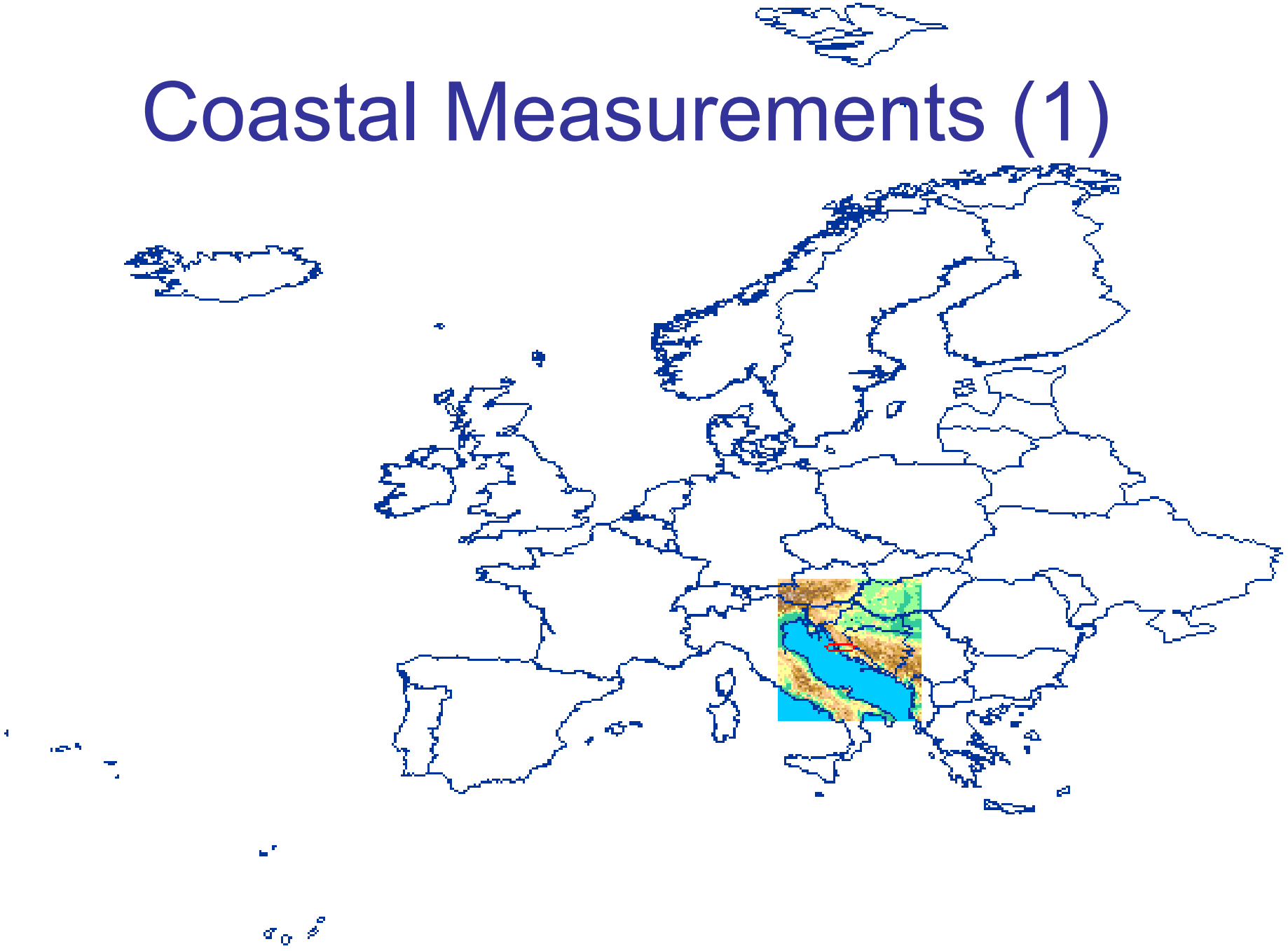
Summary

- Motivation
- Coastal measurements and ALADIN
- Results
- Preliminary Conclusions

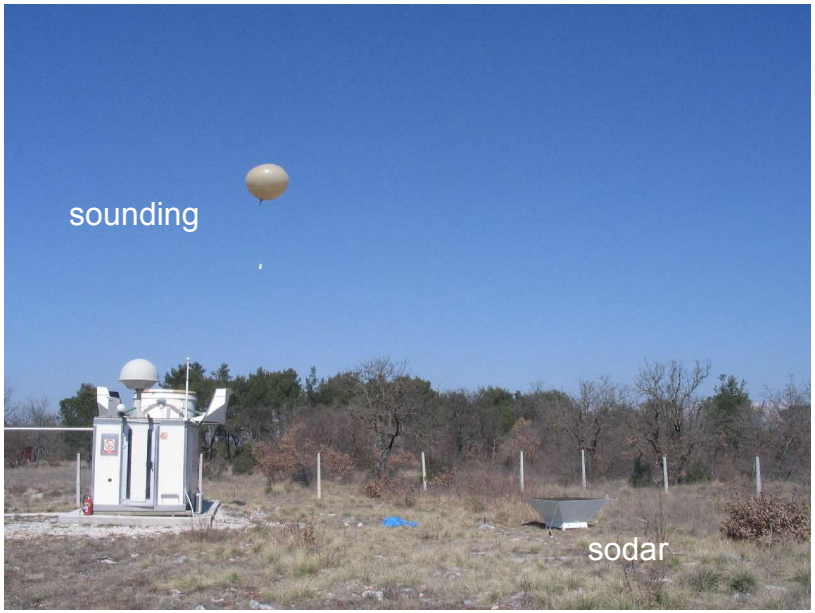
Motivation

- To analyse data of new sodar employed at Zadar, eastern Adriatic coast
- To compare sodar, radiosounding and NWP model data in a few low-level jet (LLJ) cases characteristic for Zadar area

Coastal Measurements (1)



Coastal Measurements (2)



RADIO SOUNDING

Since 2002

Twice a day: 00 and 12 UTC

SODAR (Scintec MFAS)

measuring period: December 2004 – March 2005

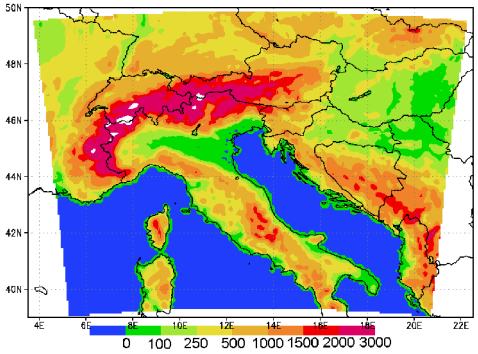
measurement range: 40 - 700 m

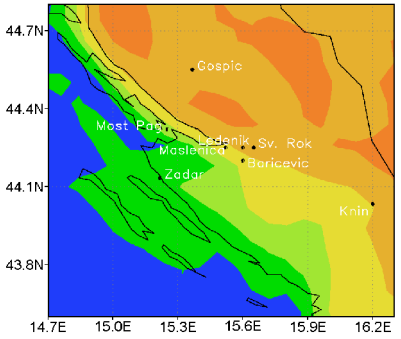
space resolution: every 20 m

averaging and output intervals: 10 min

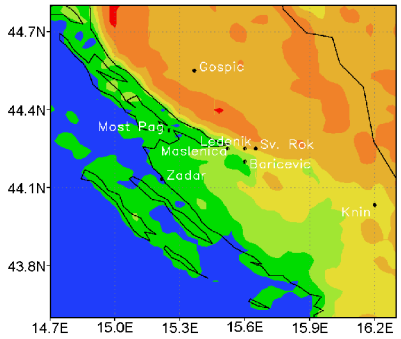
Aladin

- Operational ALADIN/HR 8 km 25T1_op2



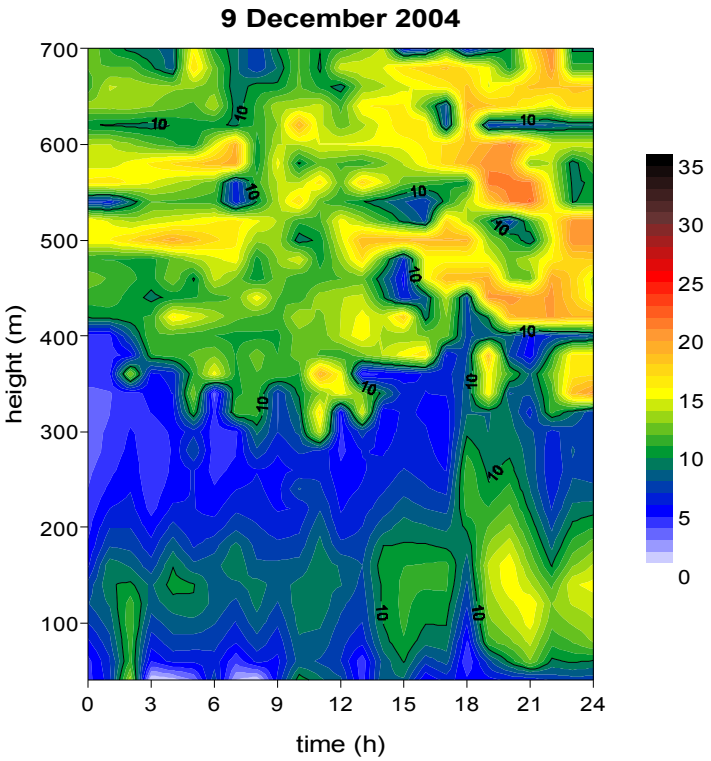


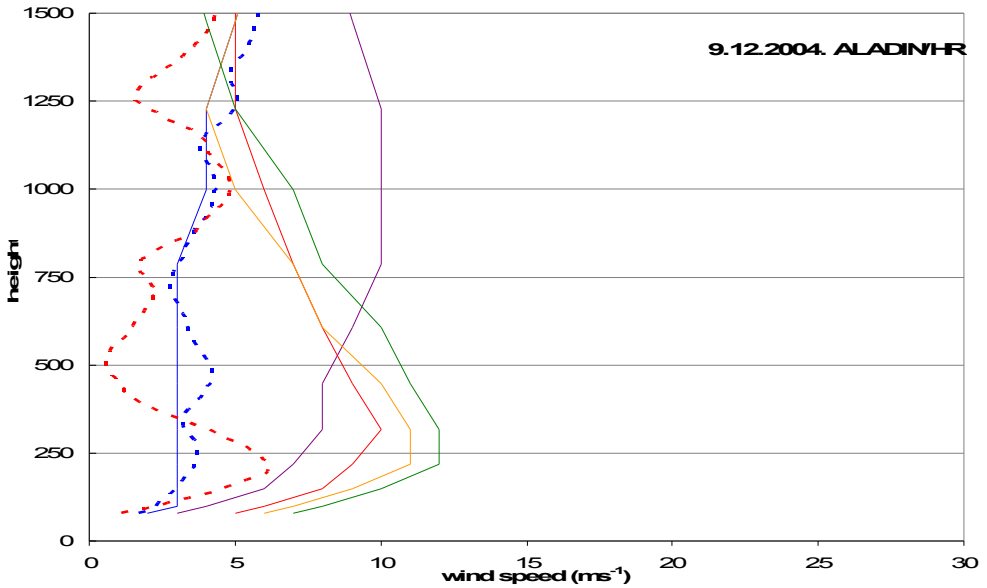
- Dynamical adaptation 2 km

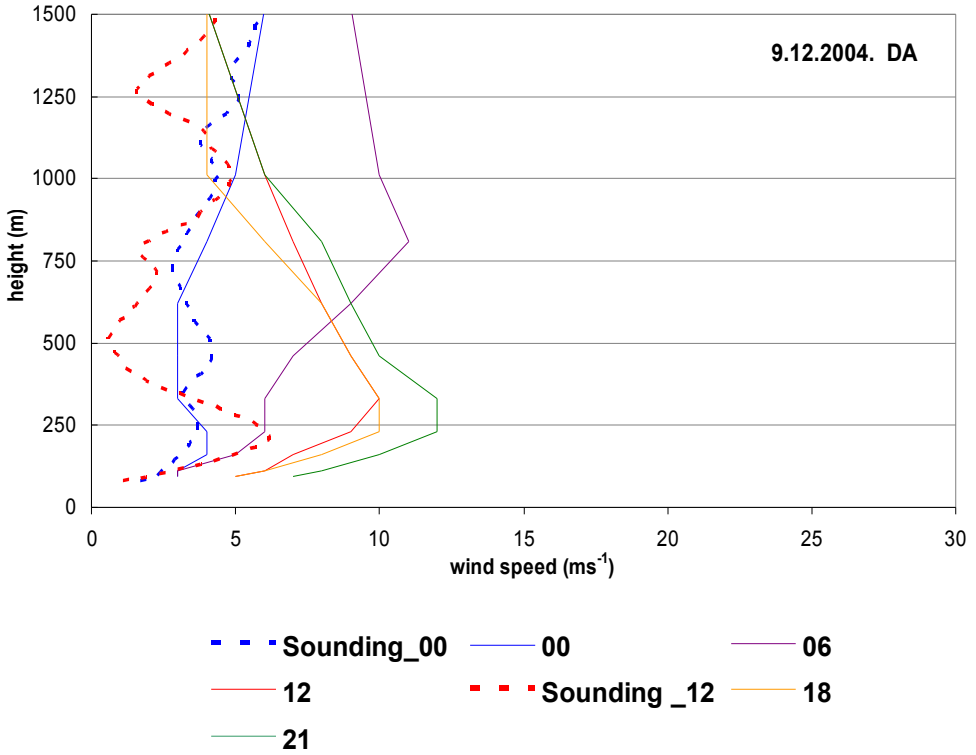


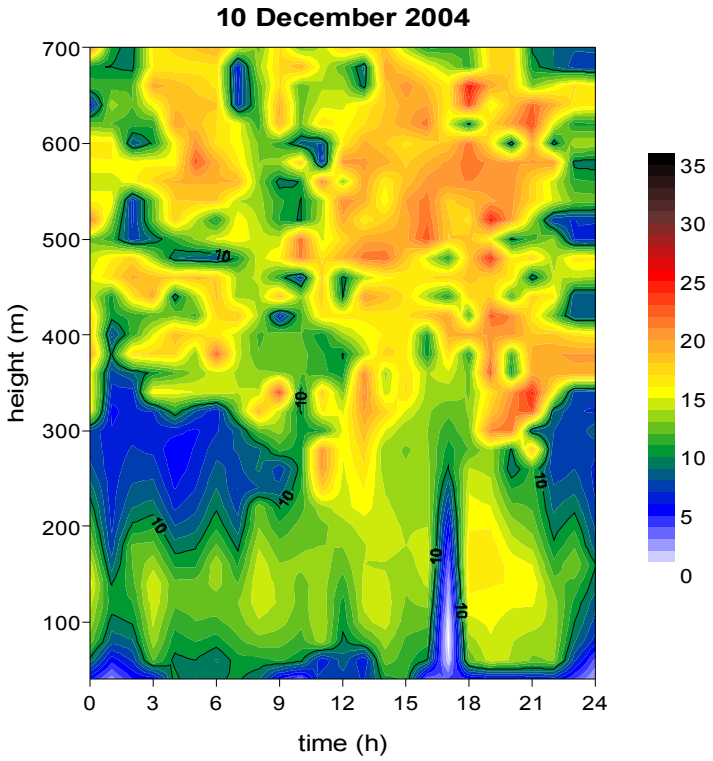
RESULTS

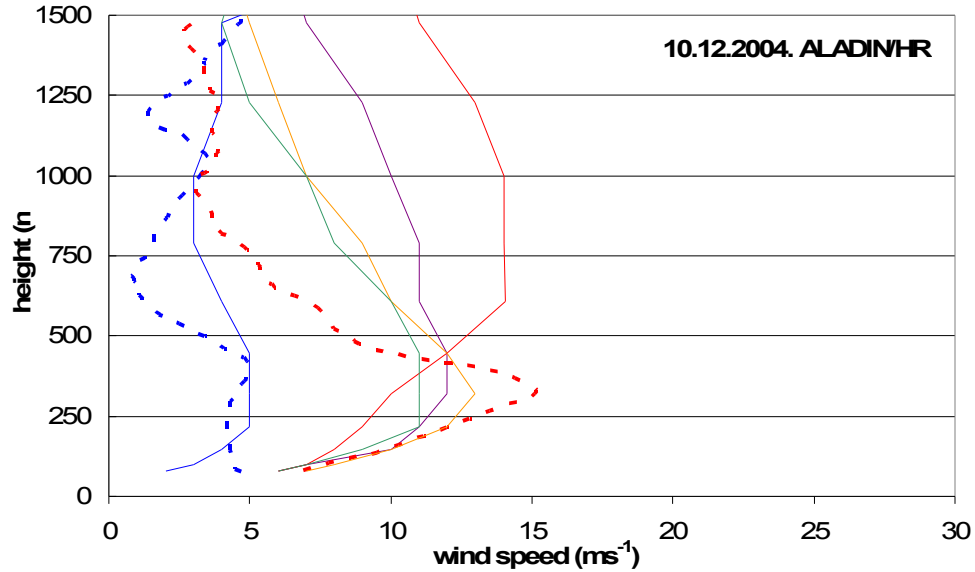
- 1st LLJ case
  9-10 December 2004

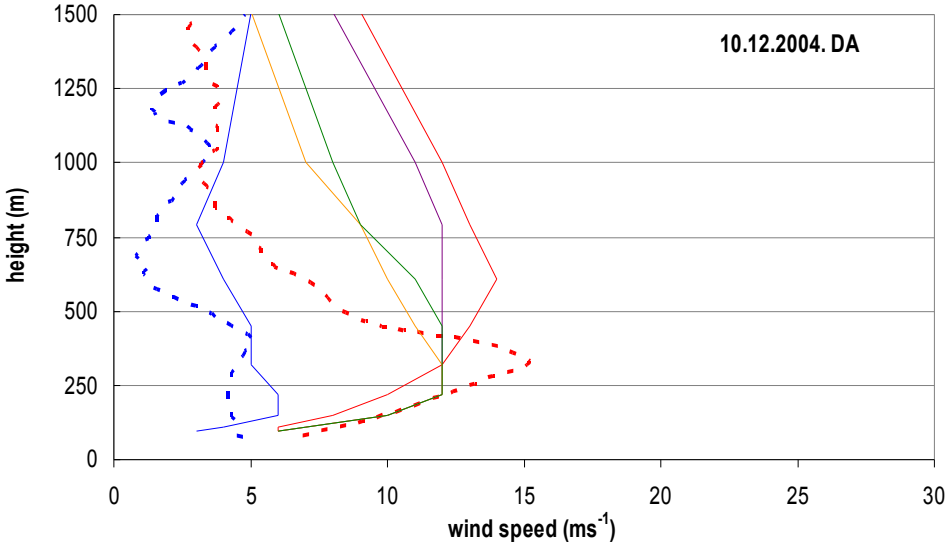


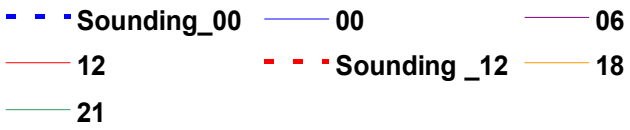




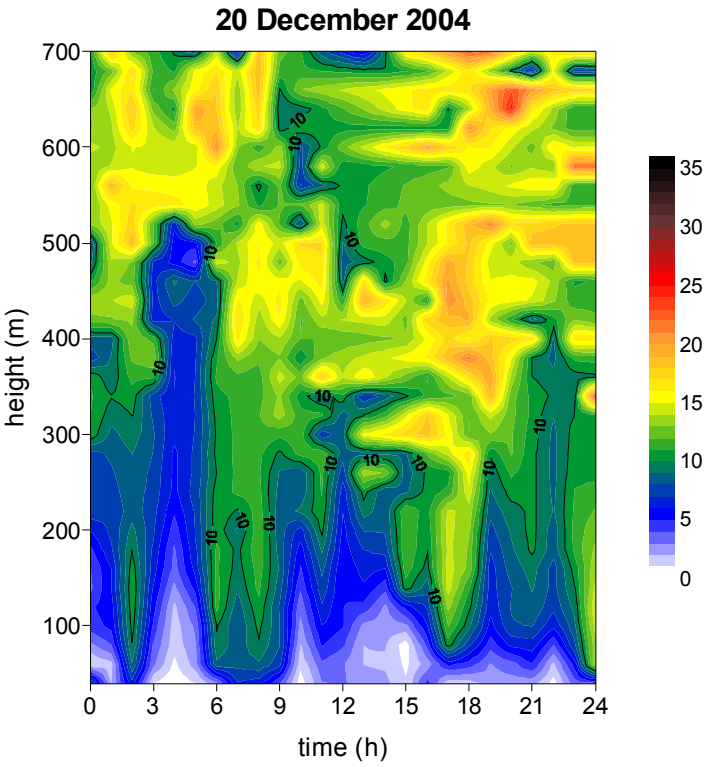

10 December 2004
height (m)
time (h)
0
3
6
9
12
15
18
21
24
100
200
300
400
500
600
700
10
35
30
25
20
15
10
5
0

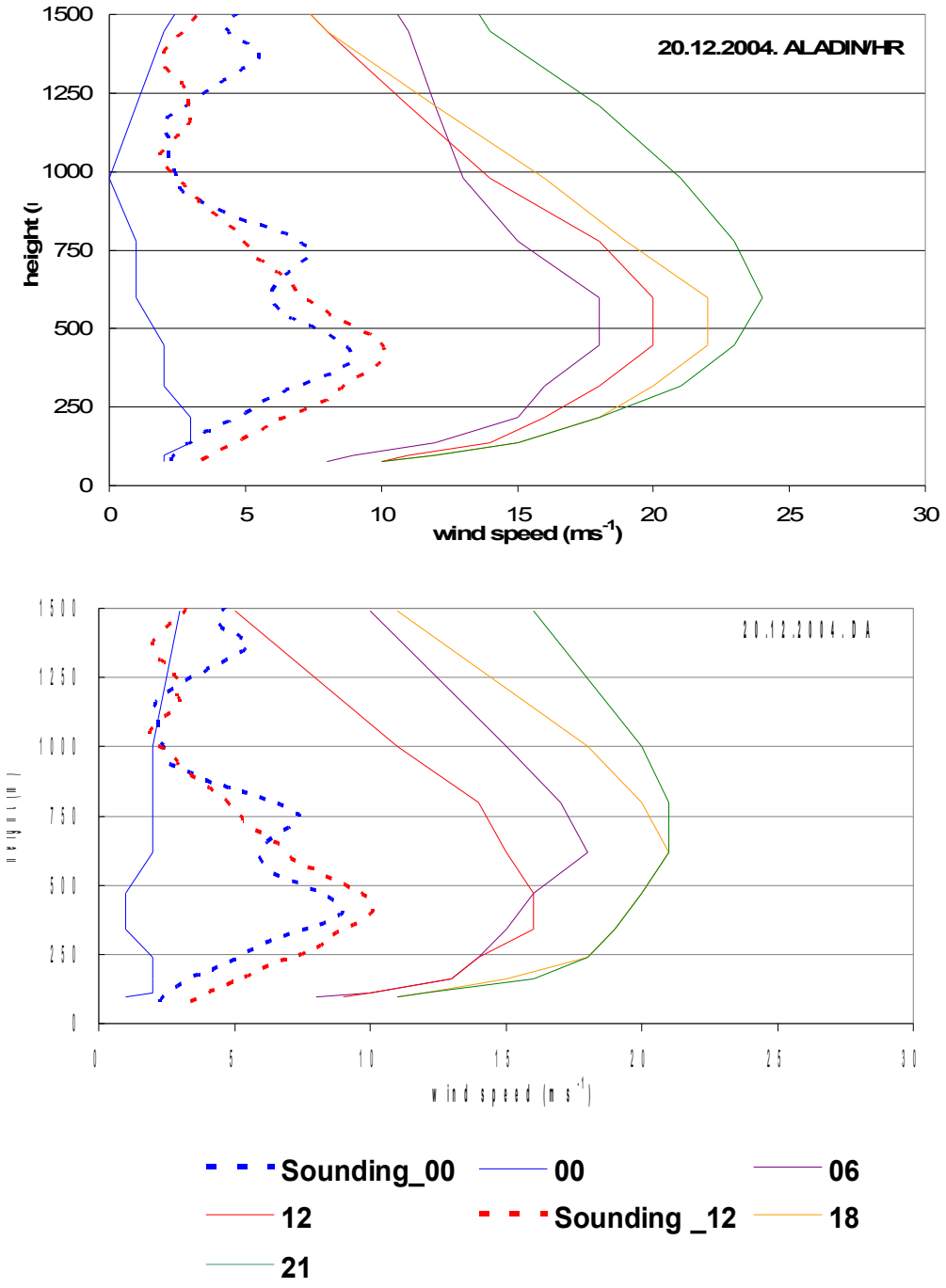

10.12.2004. ALADIN/HR
height (m)
wind speed (ms-1)
0
250
500
750
1000
1250
1500
0
5
10
15
20
25
30

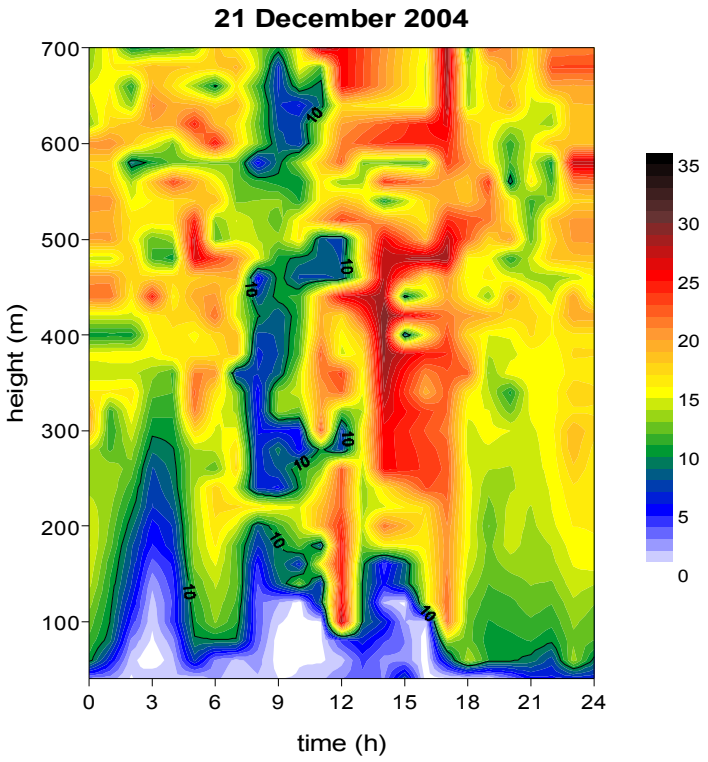

10.12.2004. DA
height (m)
wind speed (ms-1)
0
250
500
750
1000
1250
1500
0
5
10
15
20
25
30

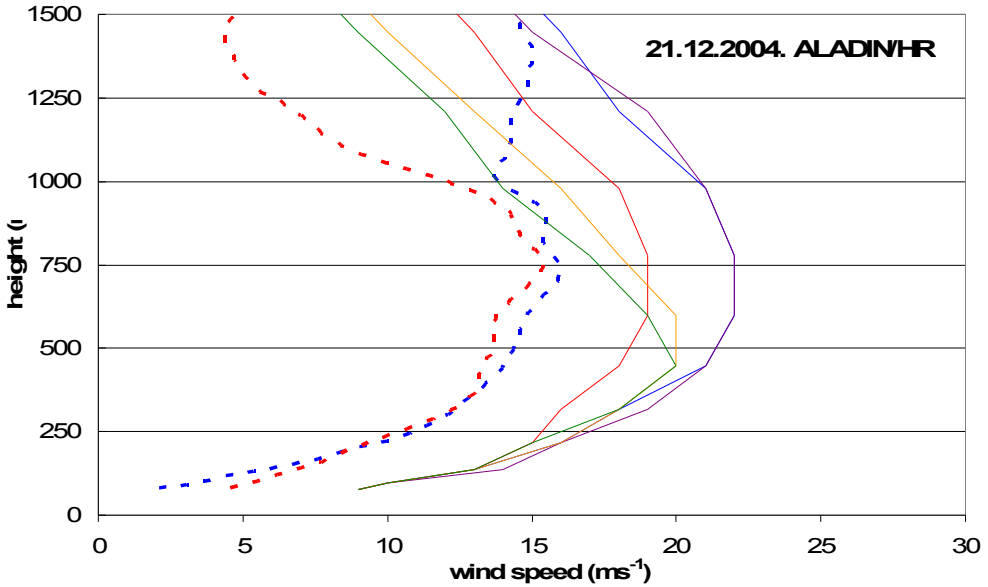

Sounding_00
00
06
12
Sounding _12
18
21

- 2nd LLJ case
  20-22 December 2004






21 December 2004
height (m)
time (h)
0
3
6
9
12
15
18
21
24
100
200
300
400
500
600
700
10
35
30
25
20
15
10
5
0


21.12.2004. ALADIN/HR
height (
wind speed (ms-1)
0
250
500
750
1000
1250
1500
0
5
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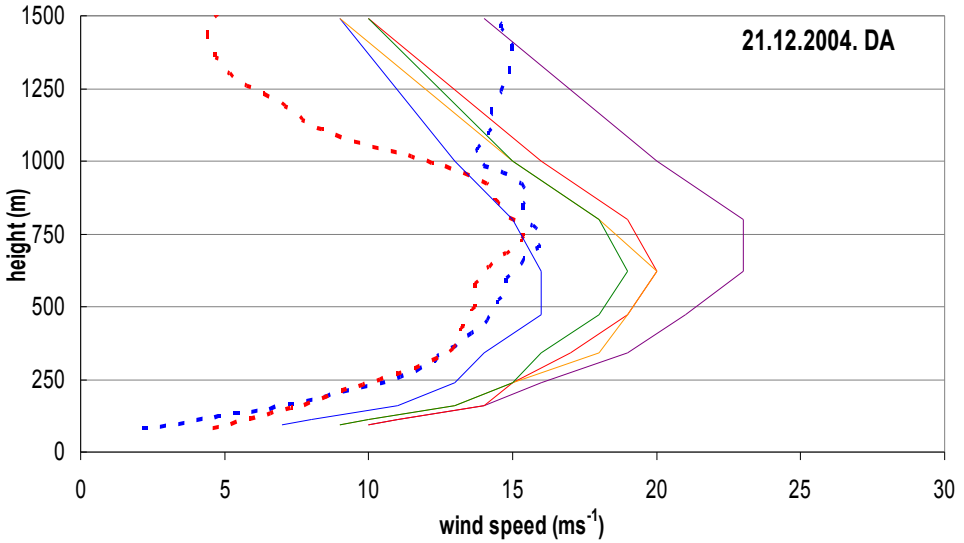
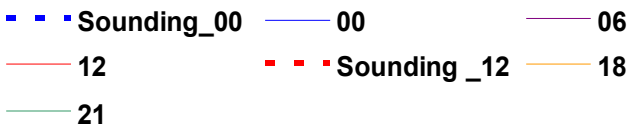
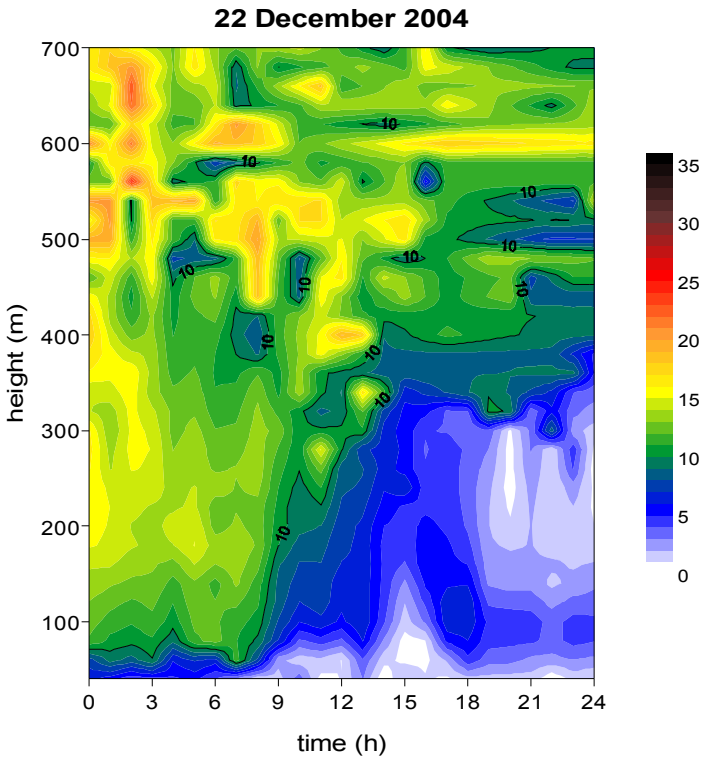
15
20
25
30


21.12.2004. DA
height (m)
wind speed (ms-1)
0
250
500
750
1000
1250
1500
0
5
10
15
20
25
30


Sounding_00
00
06
12
Sounding _12
18
21


22 December 2004
height (m)
time (h)
0
3
6
9
12
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18
21
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100
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500
600
700
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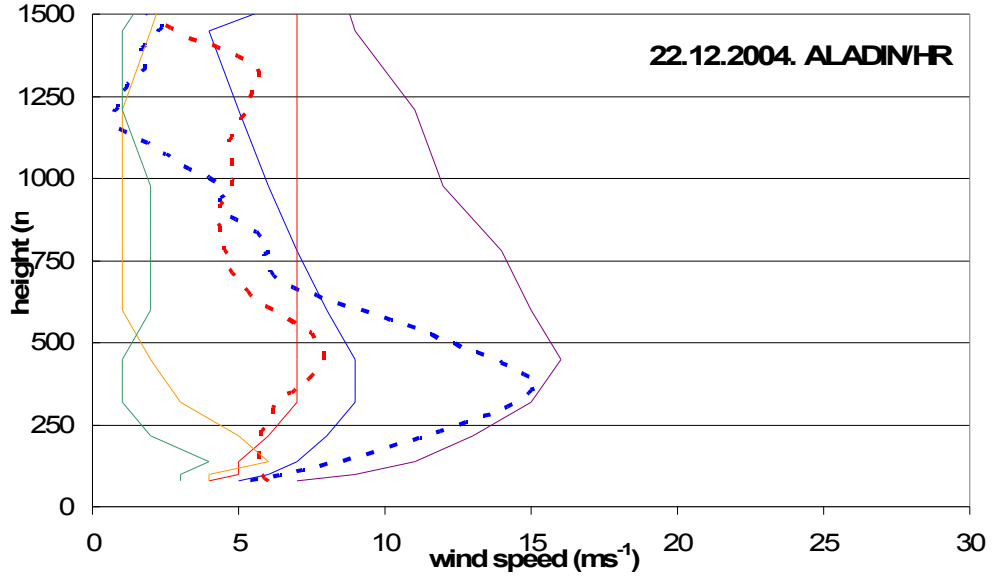
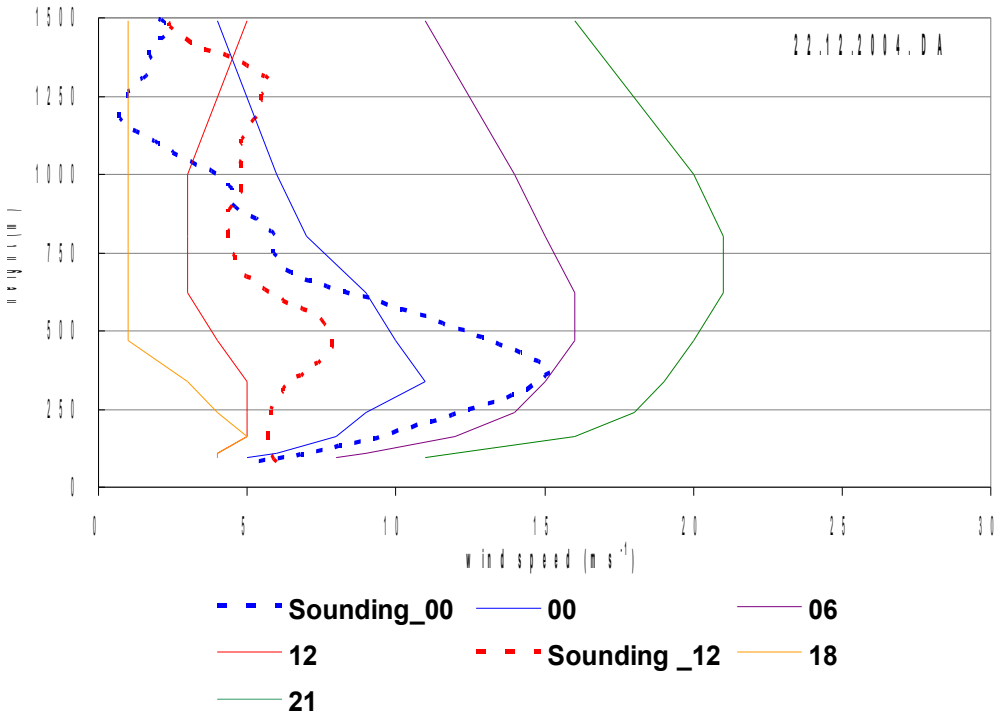
35
30
25
20
15
10
5
0


22.12.2004. ALADIN/HR
height (m
wind speed (ms-1)
0
250
500
750
1000
1250
1500
0
5
10
15
20
25
30


Sounding_00
00
06
12
Sounding _12
18
21

Conclusions

- Soundings, going twice a day, do not give adequate representations of LLJ
- The sodar data shows LLJ development and its daily dynamics
- LLJ at Zadar site is driven orographically and with bura flow

- ALADIN results are in agreement with the sodar results, although underestimating (?) the observed wind speeds, they capture daily tendencies of the LLJ

Thanks for your attention!