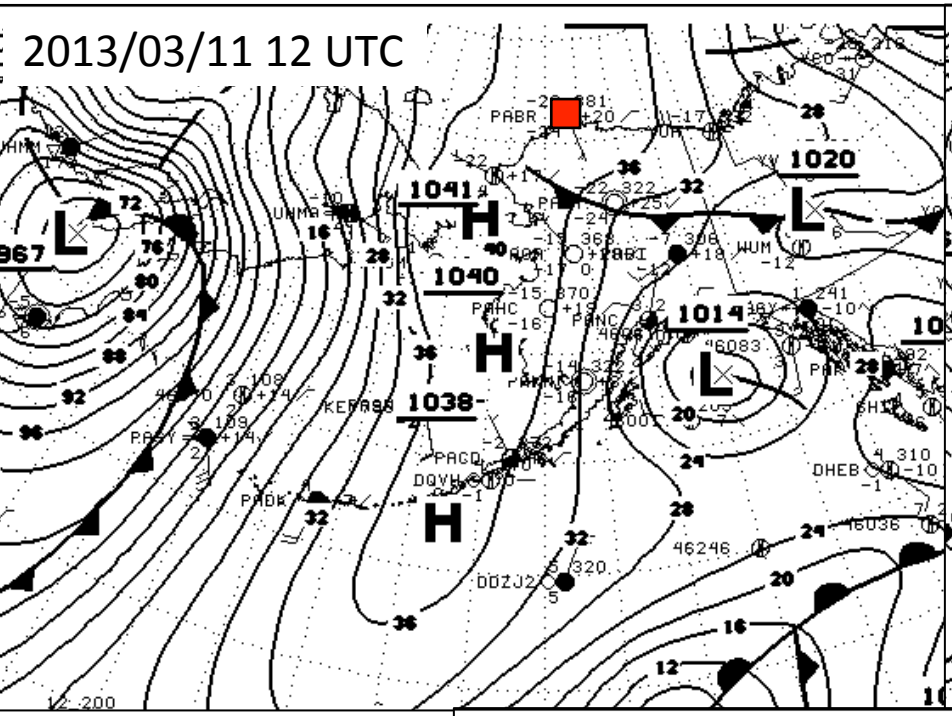
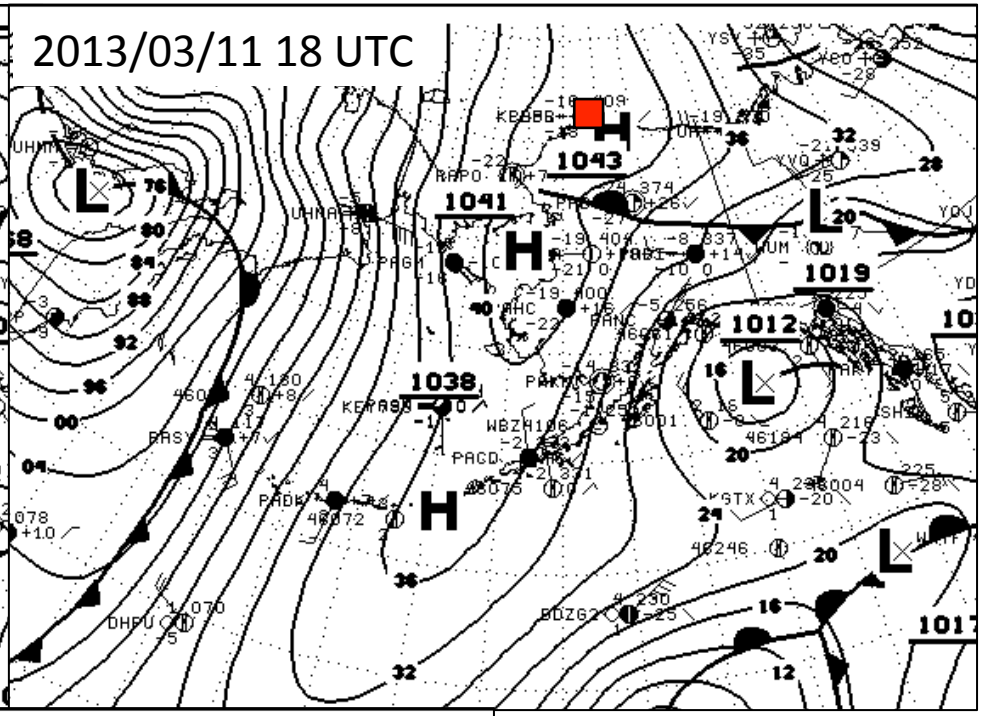
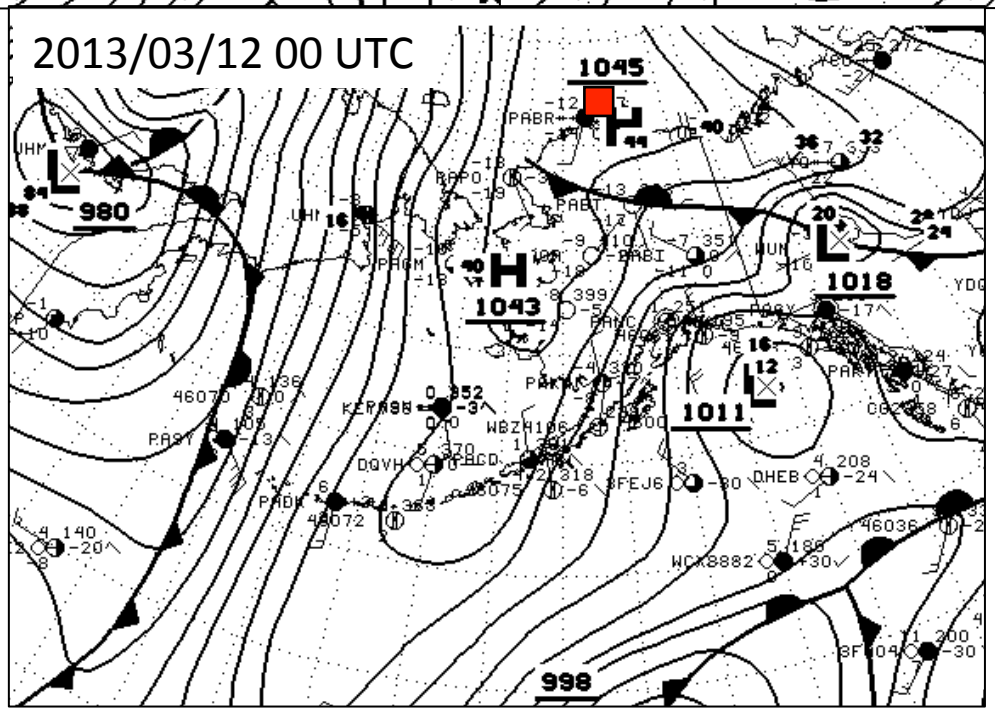
Quick overview of shallow cloud in March 2013 from the X-SAPR radar measurements

Mariko Oue
Penn State University

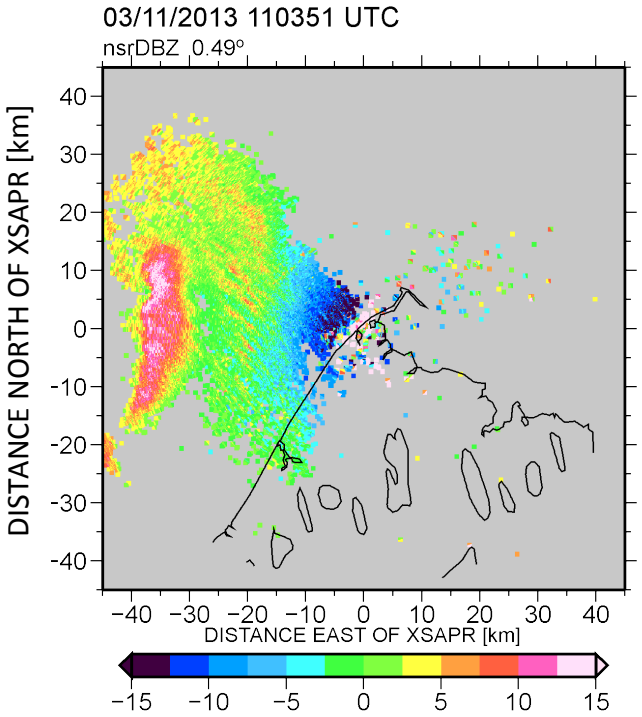

2013/03/11 12 UTC
1041
1040
1038
1020
1014
H
L

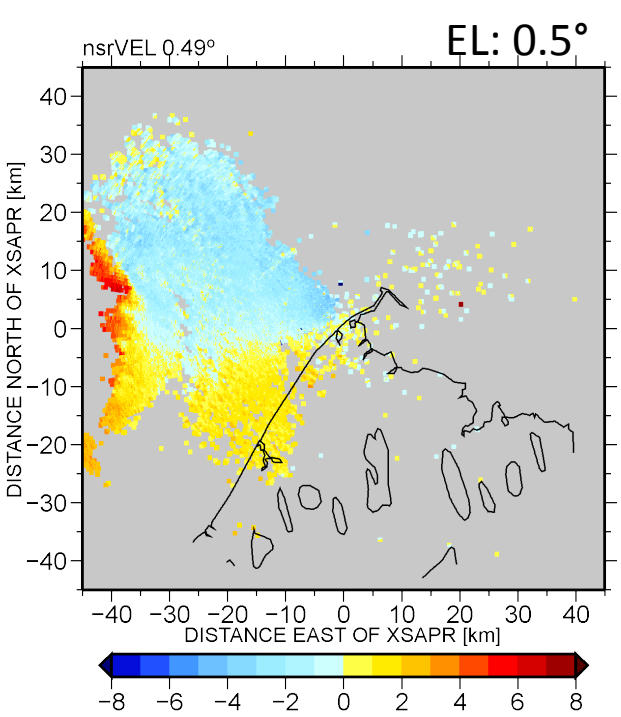

2013/03/11 18 UTC
1043
1041
1038
1019
1012
H
L


2013/03/12 00 UTC
1045
1043
1018
1011
980
998
H
L

March 11-12, 2013

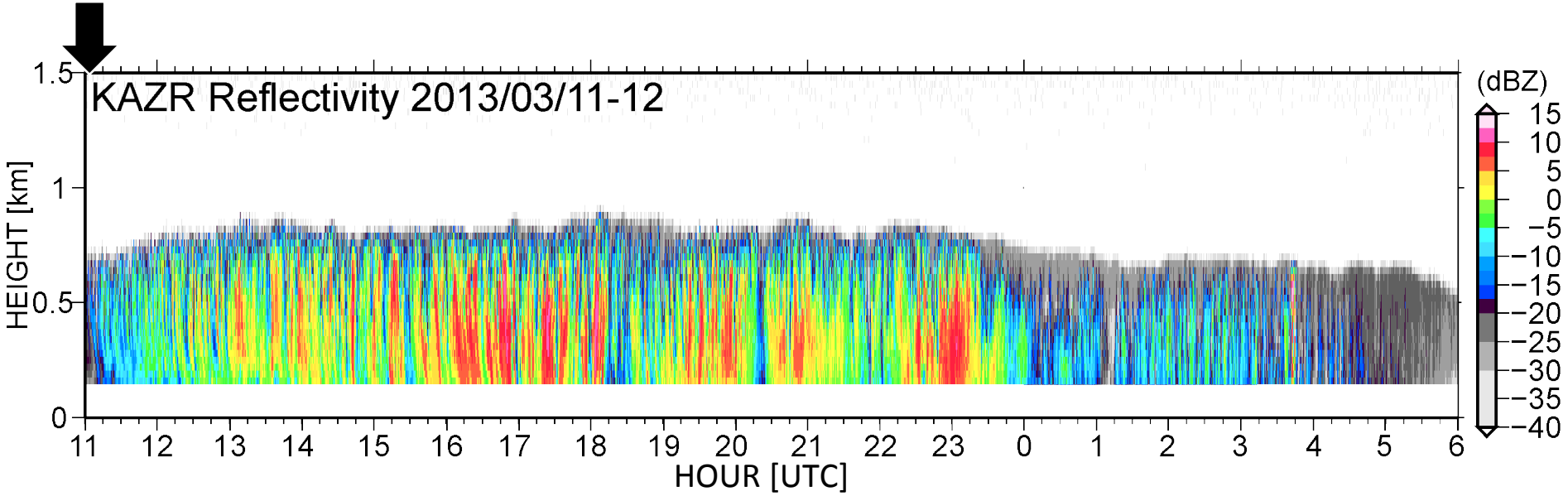
XSAPR Reflectivity





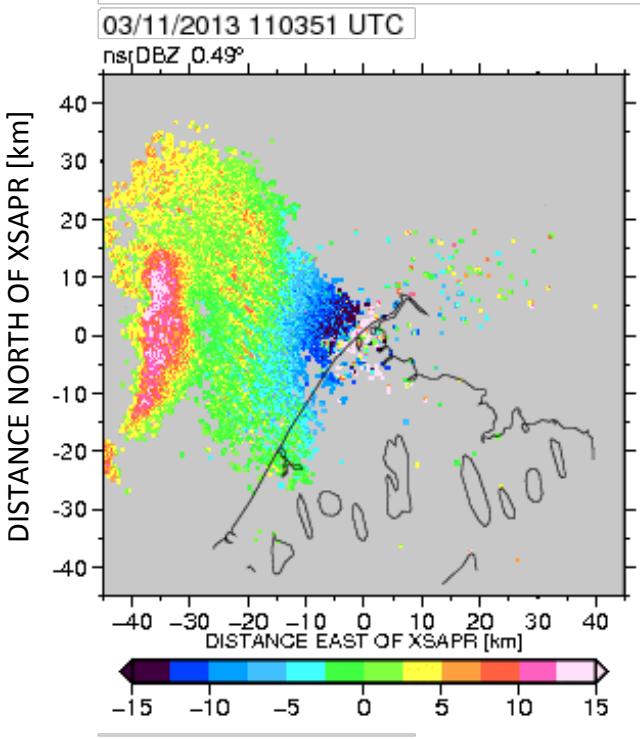
XSAPR Doppler velocity

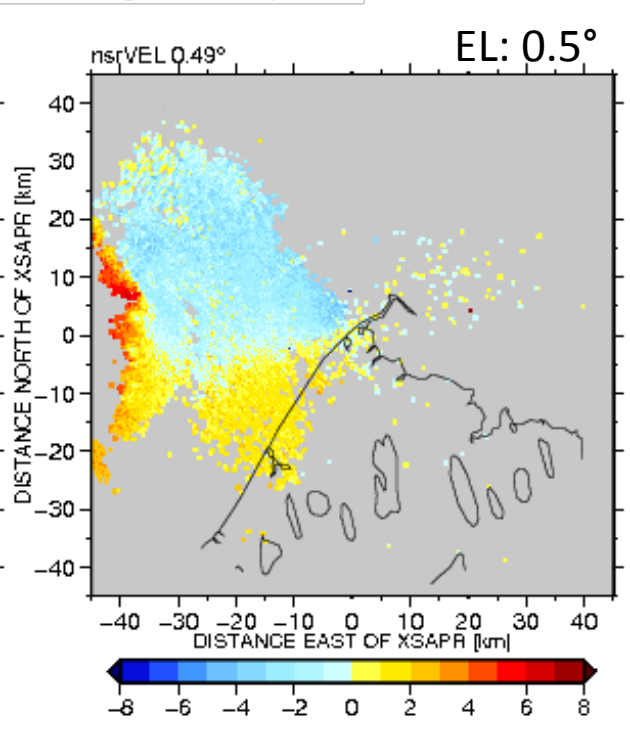
Negative: moving away from radar
Positive: moving toward radar



March 11-12, 2013

XSAPR Reflectivity





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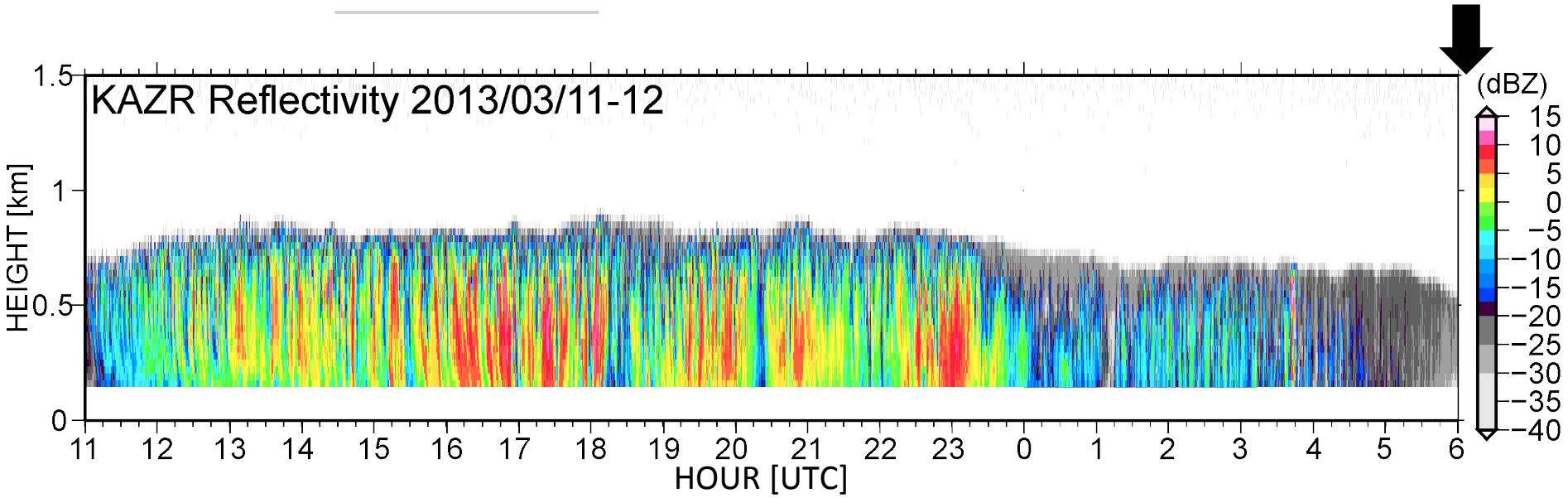
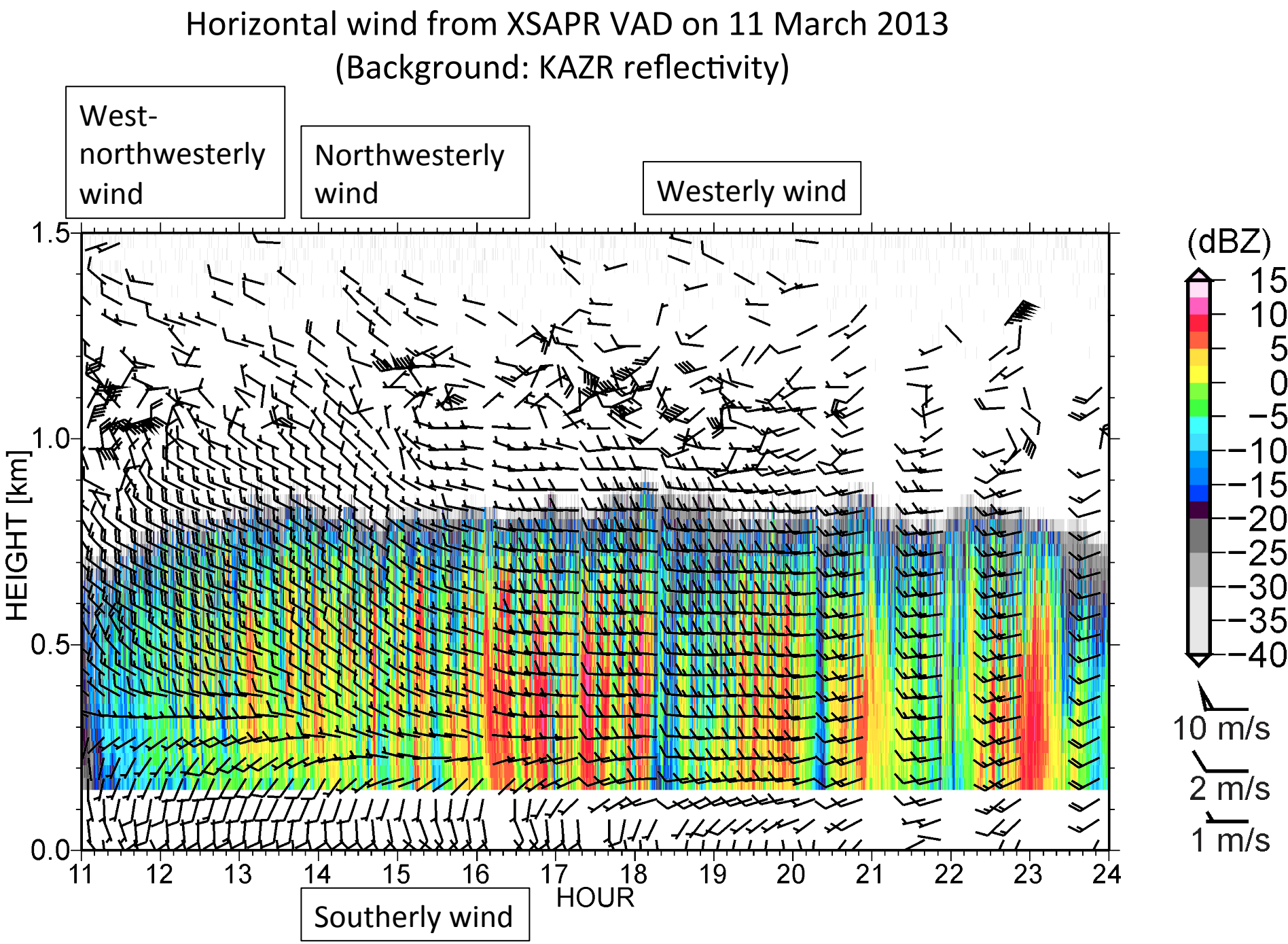
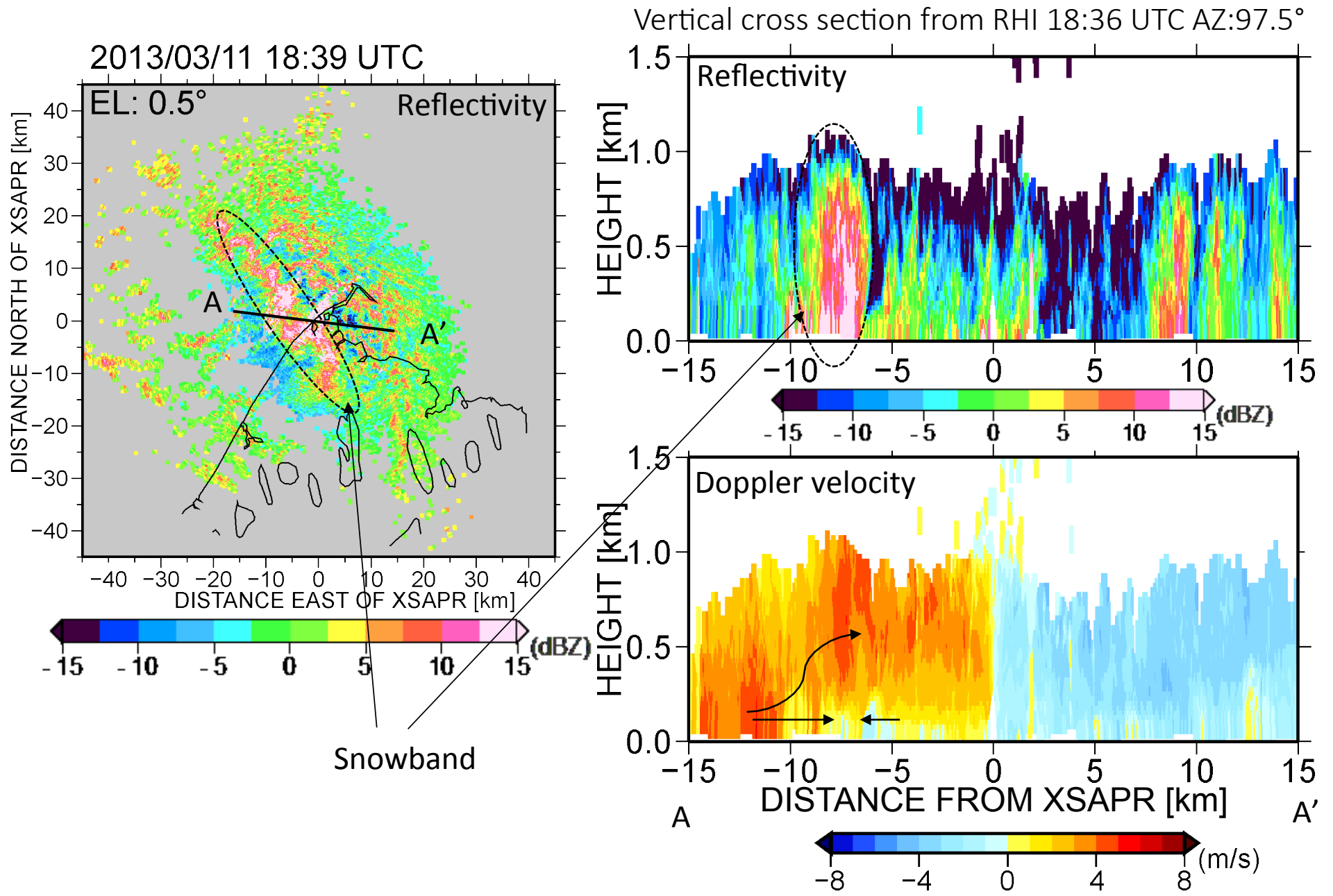
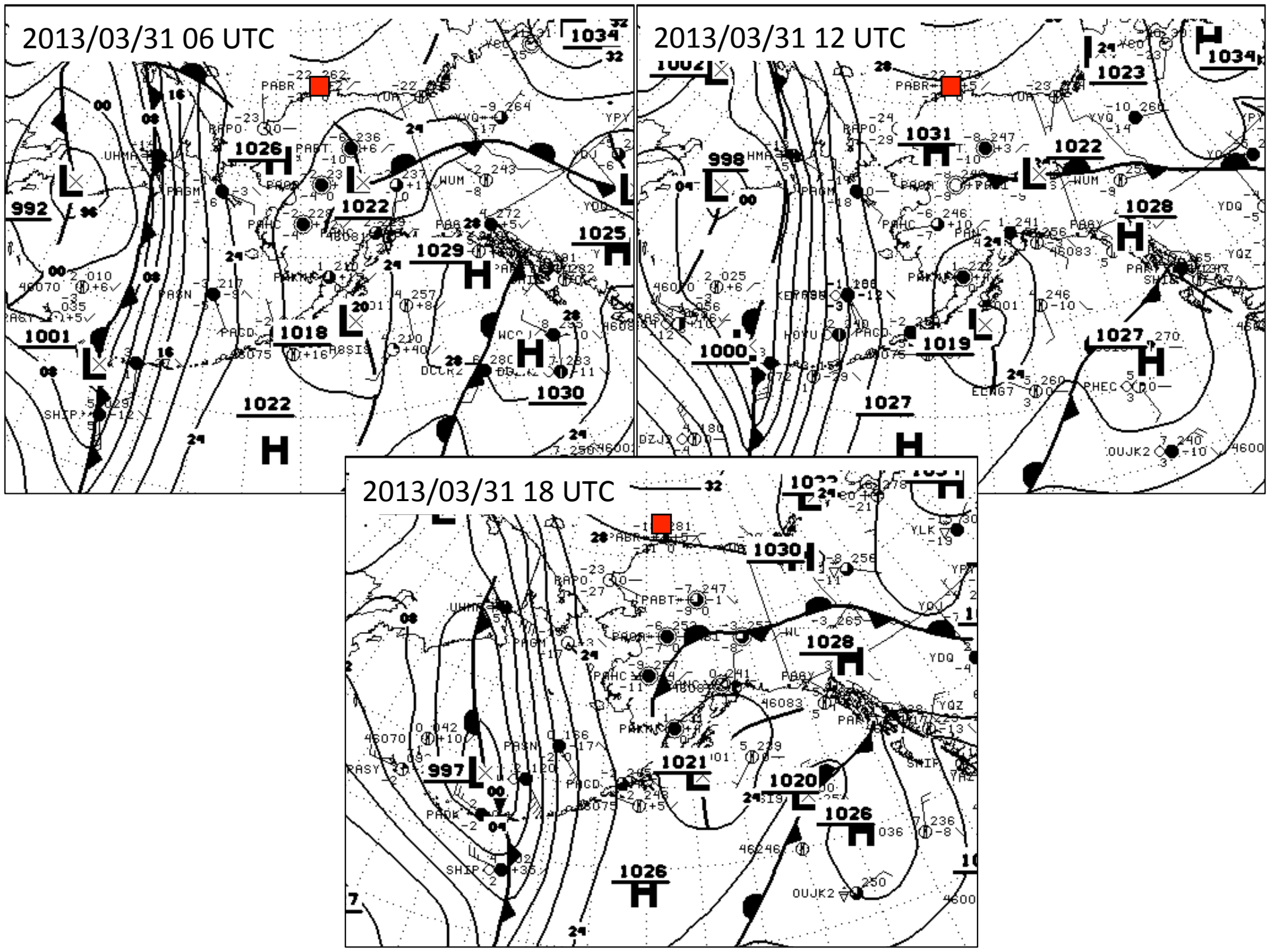



Horizontal wind from XSAPR VAD on 11 March 2013
(Background: KAZR reflectivity)
West-northwesterly wind
Northwesterly wind
Westerly wind
Southerly wind
HEIGHT [km]
1.5
1.0
0.5
0.0
11
12
13
14
15
16
17
18
19
20
21
22
23
24
HOUR
(dBZ)
15
10
5
0
−5
−10
−15
−20
−25
−30
−35
−40
10 m/s
2 m/s
1 m/s


2013/03/11 18:39 UTC
EL: 0.5°
Reflectivity
DISTANCE NORTH OF XSAPR [km]
DISTANCE EAST OF XSAPR [km]
A
A'
-15 -10 -5 0 5 10 15 (dBZ)
Snowband
Vertical cross section from RHI 18:36 UTC AZ:97.5°
Reflectivity
HEIGHT [km]
-15 -10 -5 0 5 10 15 (dBZ)
Doppler velocity
HEIGHT [km]
DISTANCE FROM XSAPR [km]
A
A'
-8 -4 0 4 8 (m/s)

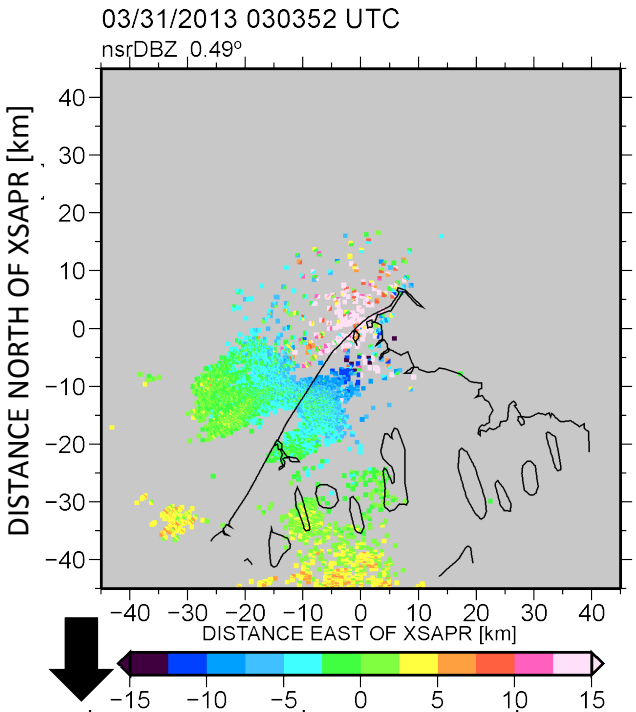
Overview of March 11 case

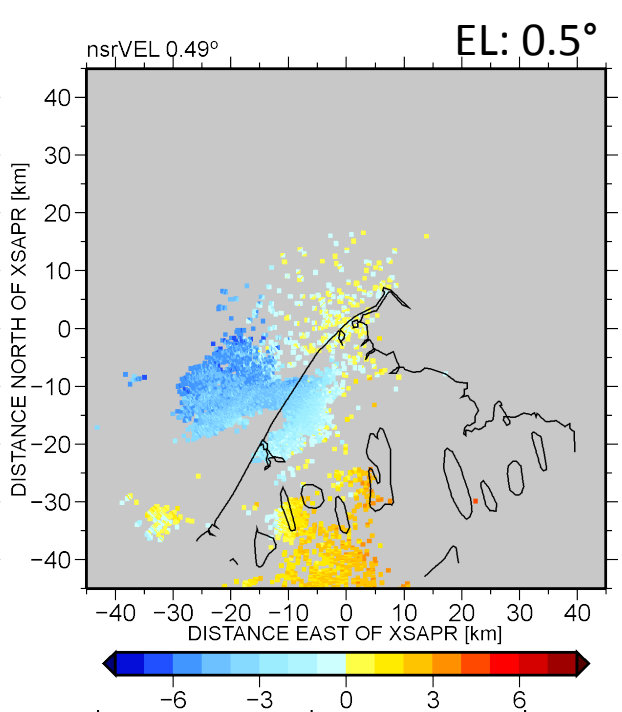
- 11 – 14 UTC
  - Widely-distributed stratocumulus
  - Low-level southerly wind (<0.3 km)
  - Upper-level west-northwesterly-wind (>0.3 km)
- 14 – 20 UTC
  - Passage of narrow snowband from west to east
  - Shallow low-level southerly-wind layer
  - Upper-level northwesterly wind → westerly wind
- 20 UTC –
  - Widely-distributed stratocumulus
  - Westerly wind


2013/03/31 06 UTC
2013/03/31 12 UTC
2013/03/31 18 UTC

March 31, 2013

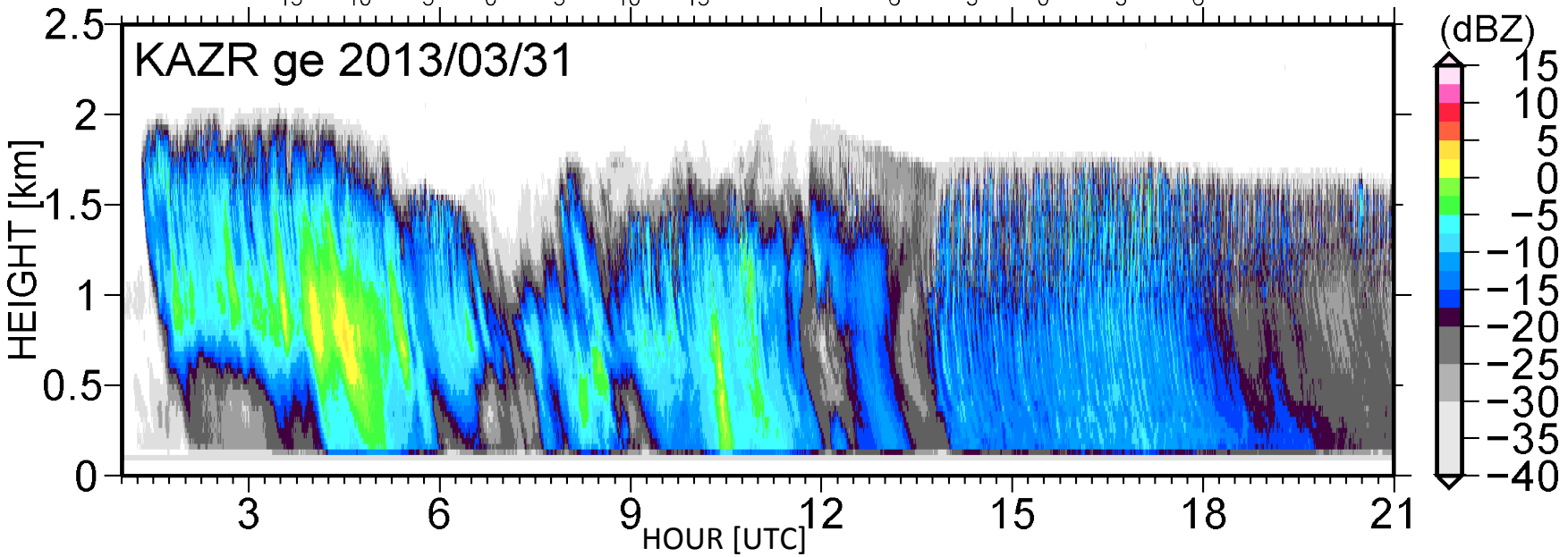
XSAPR Reflectivity





XSAPR Doppler velocity

Negative: moving away from radar
Positive: moving toward radar

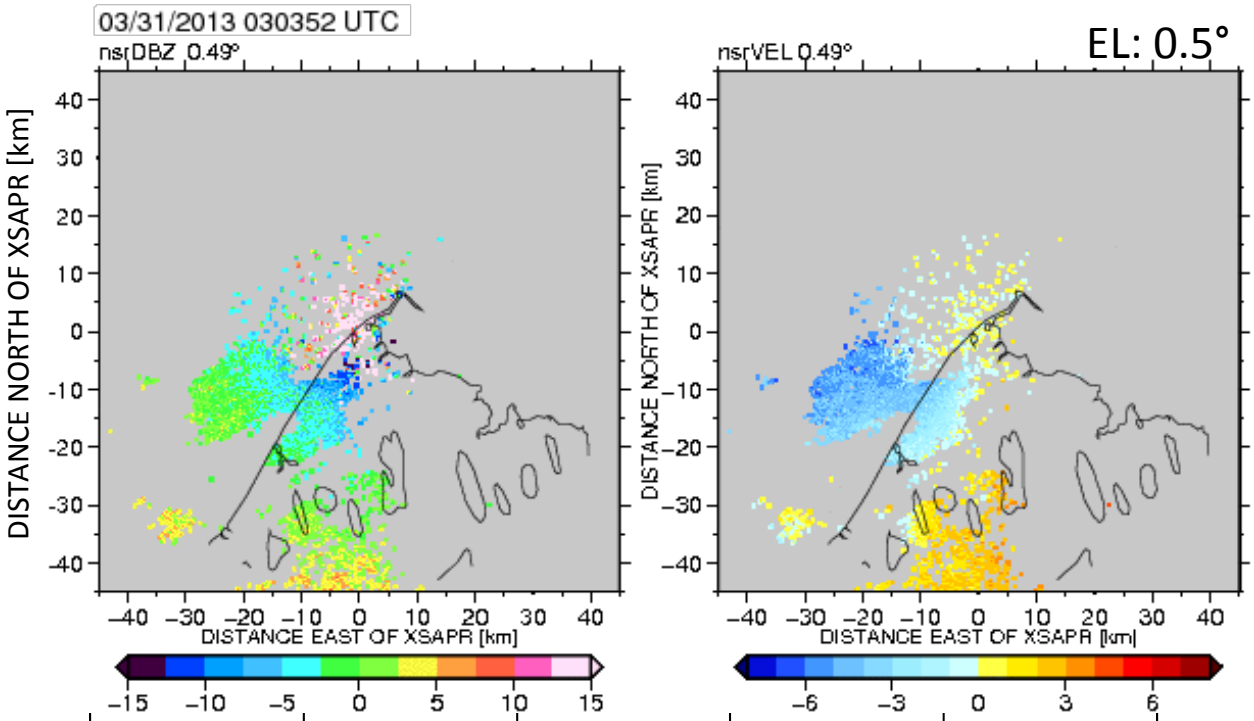


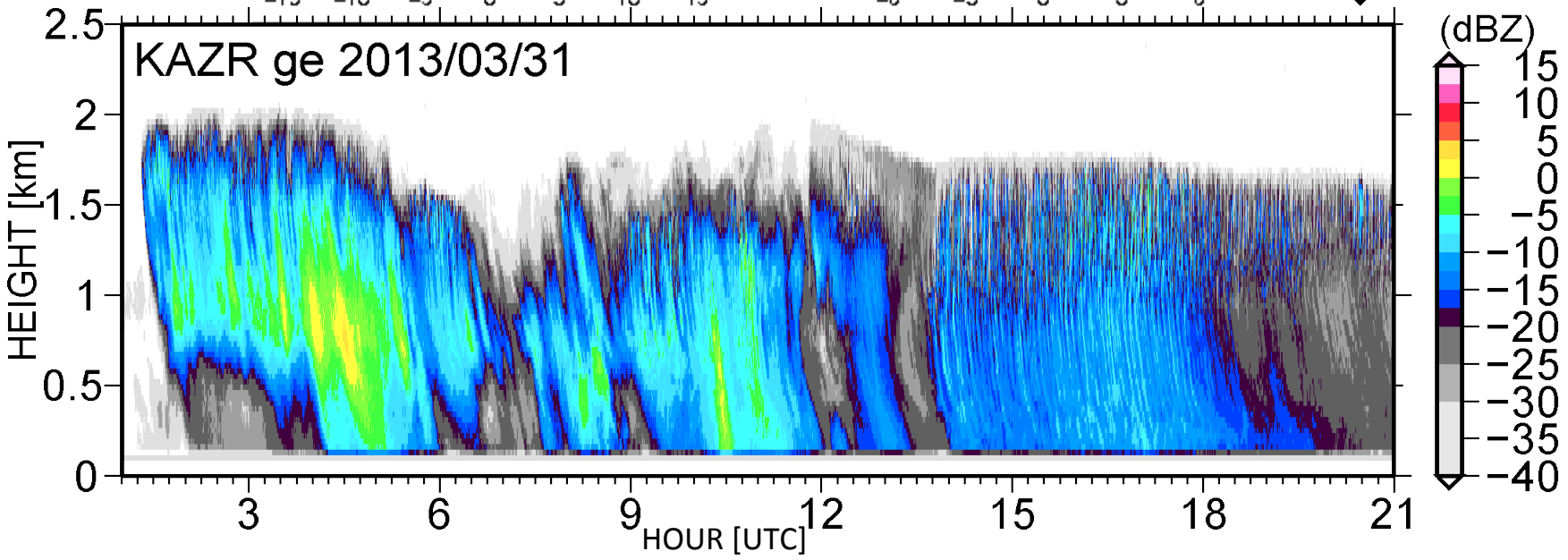
March 31, 2013

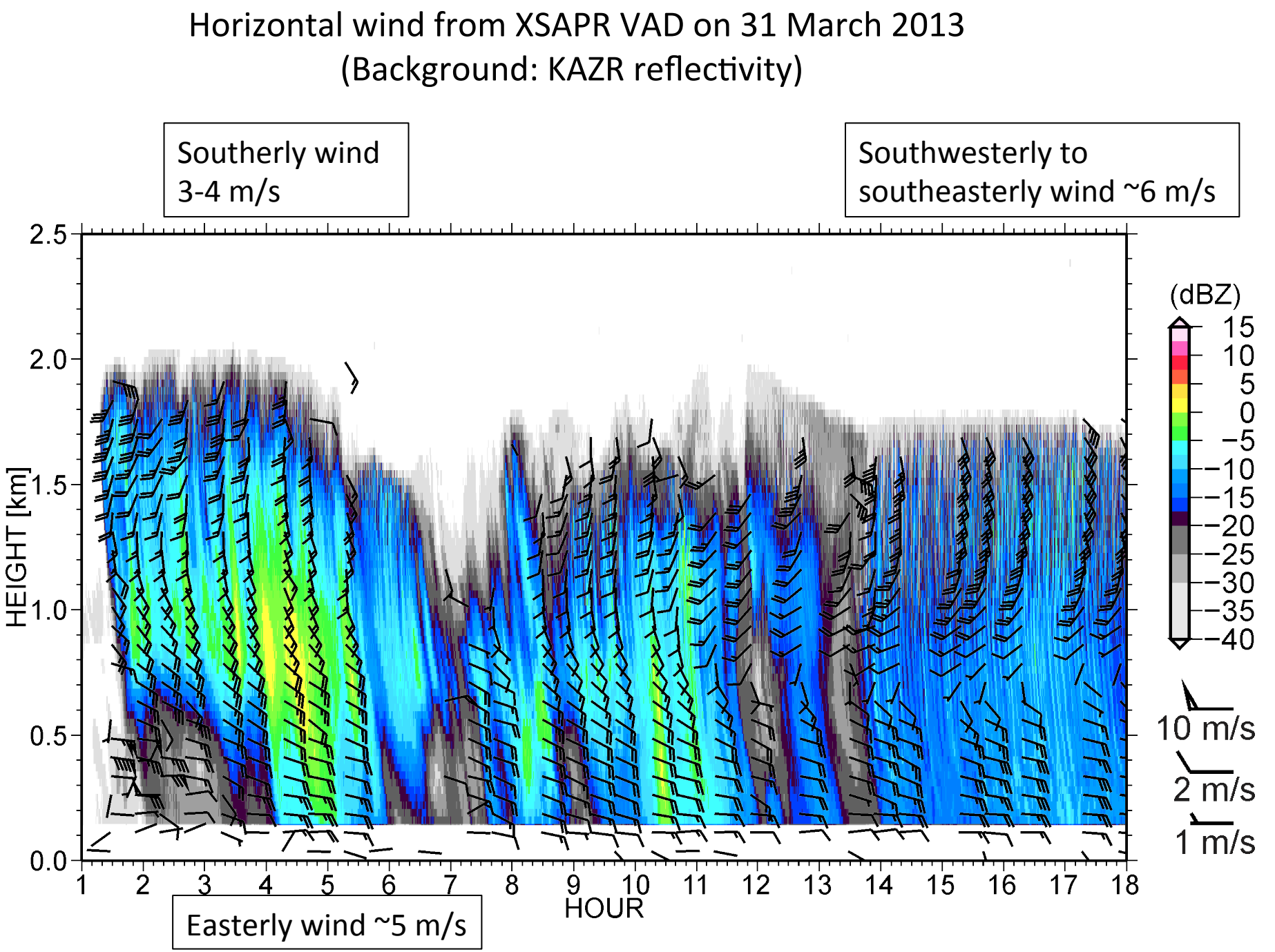
XSAPR Reflectivity

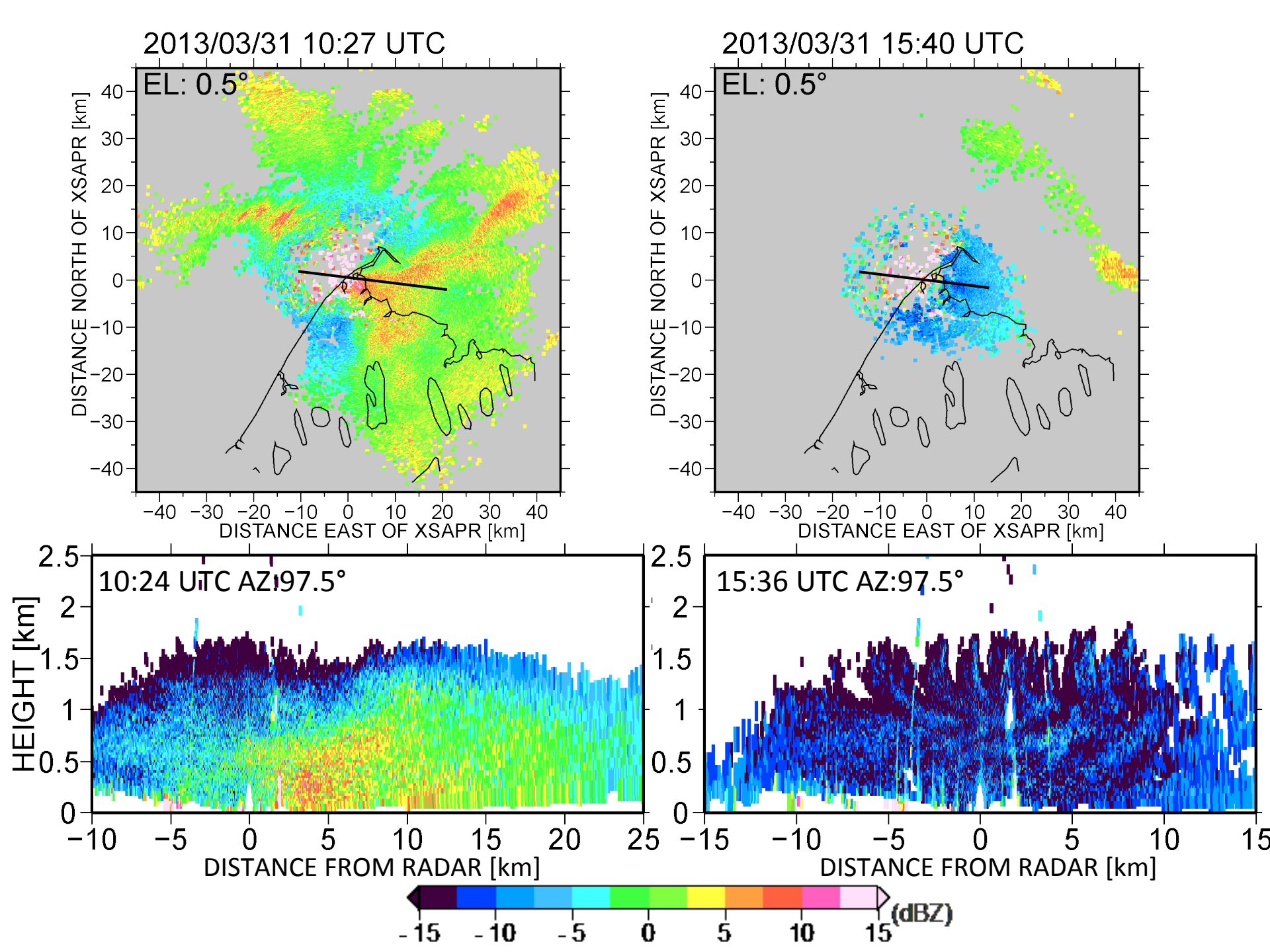
XSAPR Doppler velocity

Negative: moving away from radar
Positive: moving toward radar






Horizontal wind from XSAPR VAD on 31 March 2013
(Background: KAZR reflectivity)
Southerly wind
3-4 m/s
Southwesterly to
southeasterly wind ~6 m/s
Easterly wind ~5 m/s
HEIGHT [km]
HOUR
(dBZ)
15
10
5
0
−5
−10
−15
−20
−25
−30
−35
−40
10 m/s
2 m/s
1 m/s


2013/03/31 10:27 UTC
EL: 0.5°
DISTANCE NORTH OF XSAPR [km]
DISTANCE EAST OF XSAPR [km]
2013/03/31 15:40 UTC
EL: 0.5°
DISTANCE NORTH OF XSAPR [km]
DISTANCE EAST OF XSAPR [km]
10:24 UTC AZ:97.5°
HEIGHT [km]
DISTANCE FROM RADAR [km]
15:36 UTC AZ:97.5°
DISTANCE FROM RADAR [km]
(dBZ)

Overview of March 31 case

- 01 – 14 UTC
  - Stratiform cloud moving toward north
  - Low-level easterly wind (<1 km)
  - Upper-level southerly-wind (>1 km)
- 14 UTC –
  - Generating cells
  - Low-level easterly wind (<0.8 km)
  - Southwesterly to southeasterly winds (>0.8 km)