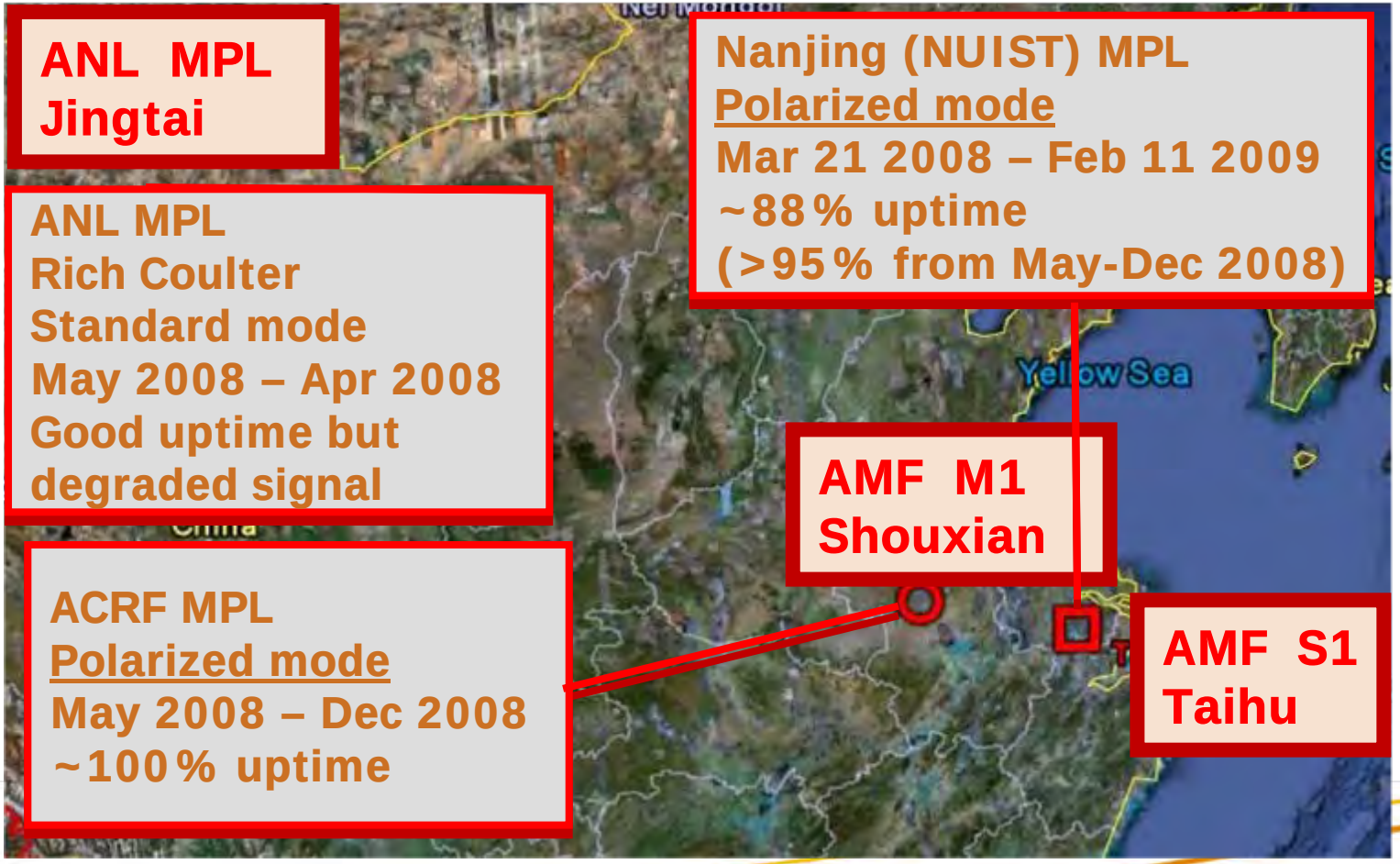
AMF China LIDAR Summary

Connor Flynn, PNNL

- MPLs deployed for AMF campaign
- Summary of data dispostion
- MPL polarization technique, implications
- Visual survey with

AMF China supported by 3 MPL systems



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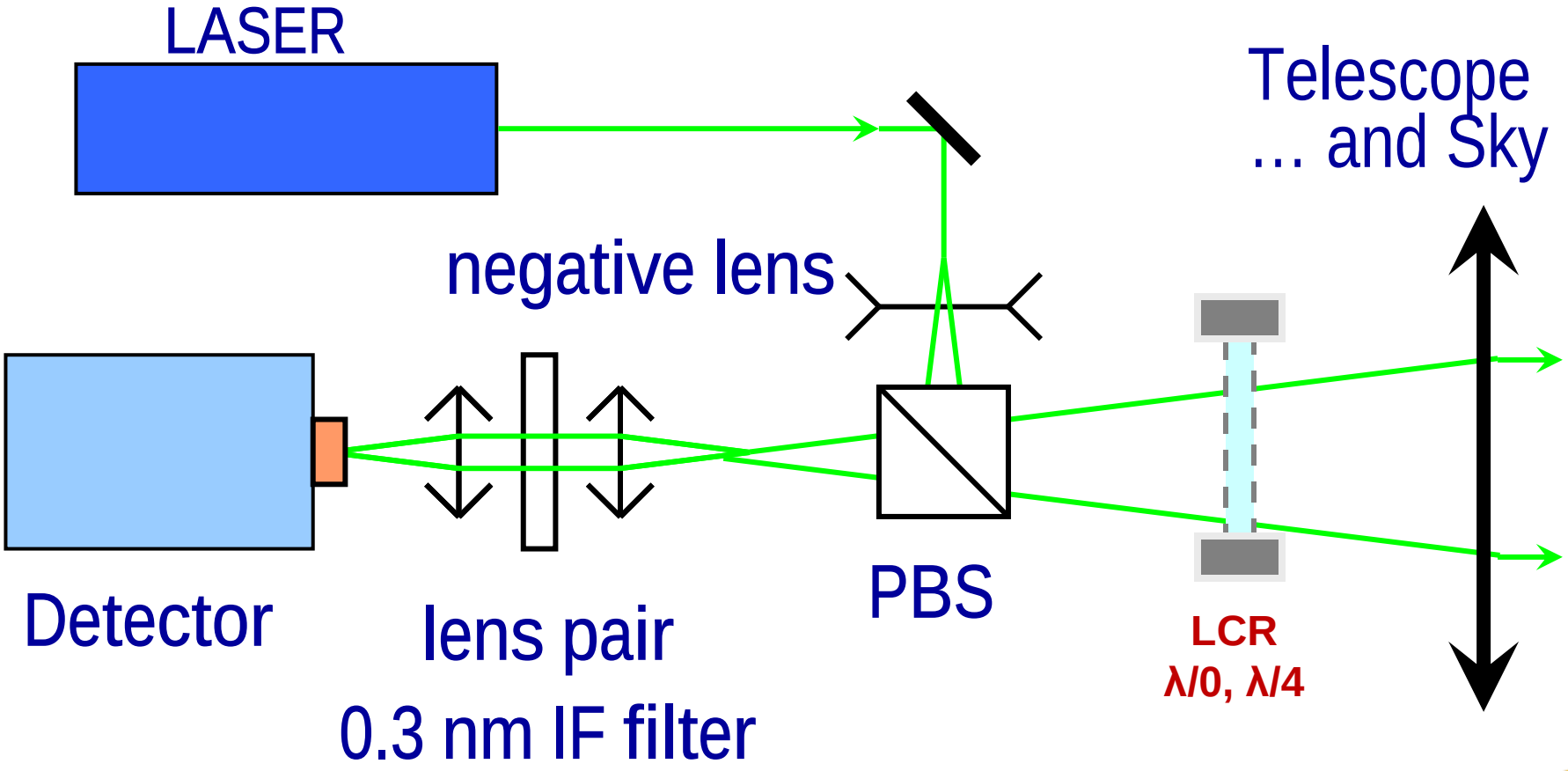
Polarization-Sensitive Measurement

- Mode 1: LCR as half-wave retarder
  - Transmits / detects linearly polarized radiation
  - Mainly sensitive to non-spheres, ice, mineral dust
- Mode 2: LCR as quarter-wave retarder
  - Transmits/detects circularly polarized radiation
  - Mainly detects cloud droplets and spherical aerosols
- Alternates modes every few seconds
- New fast-switch shot-by-shot upgrade coming.

MPL with Liquid Crystal Retarder



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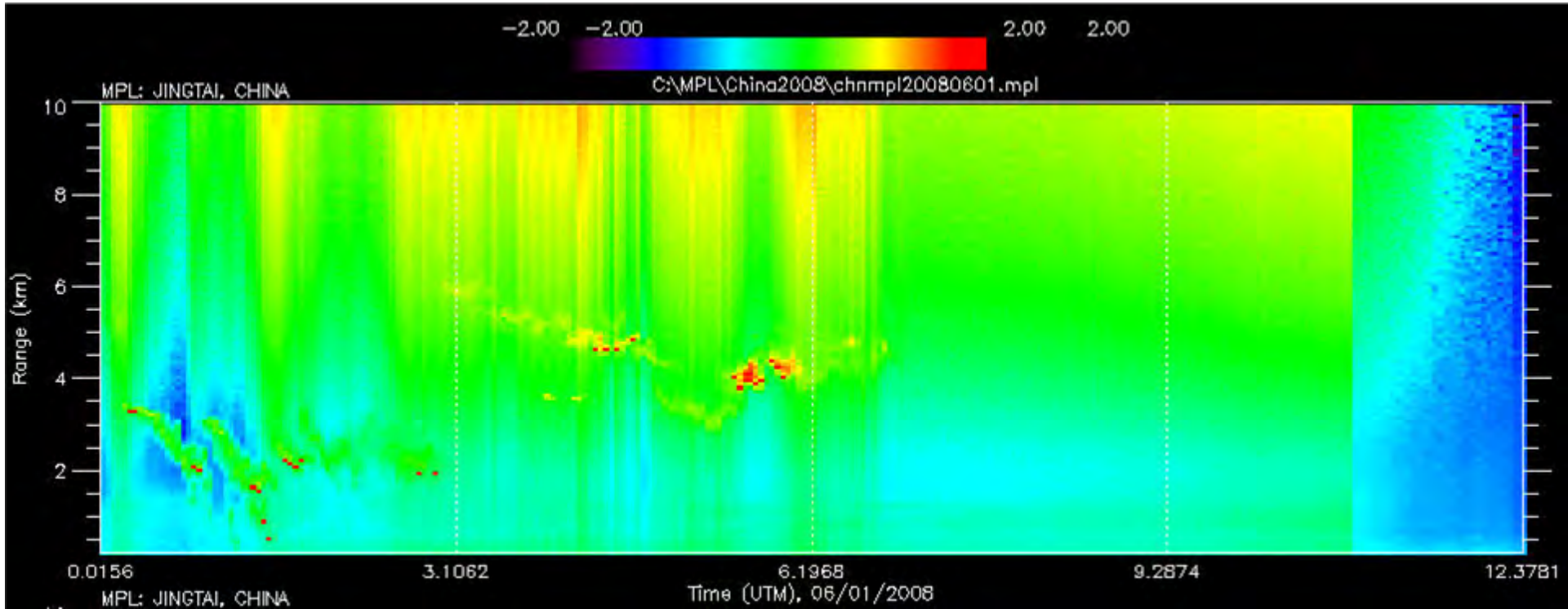
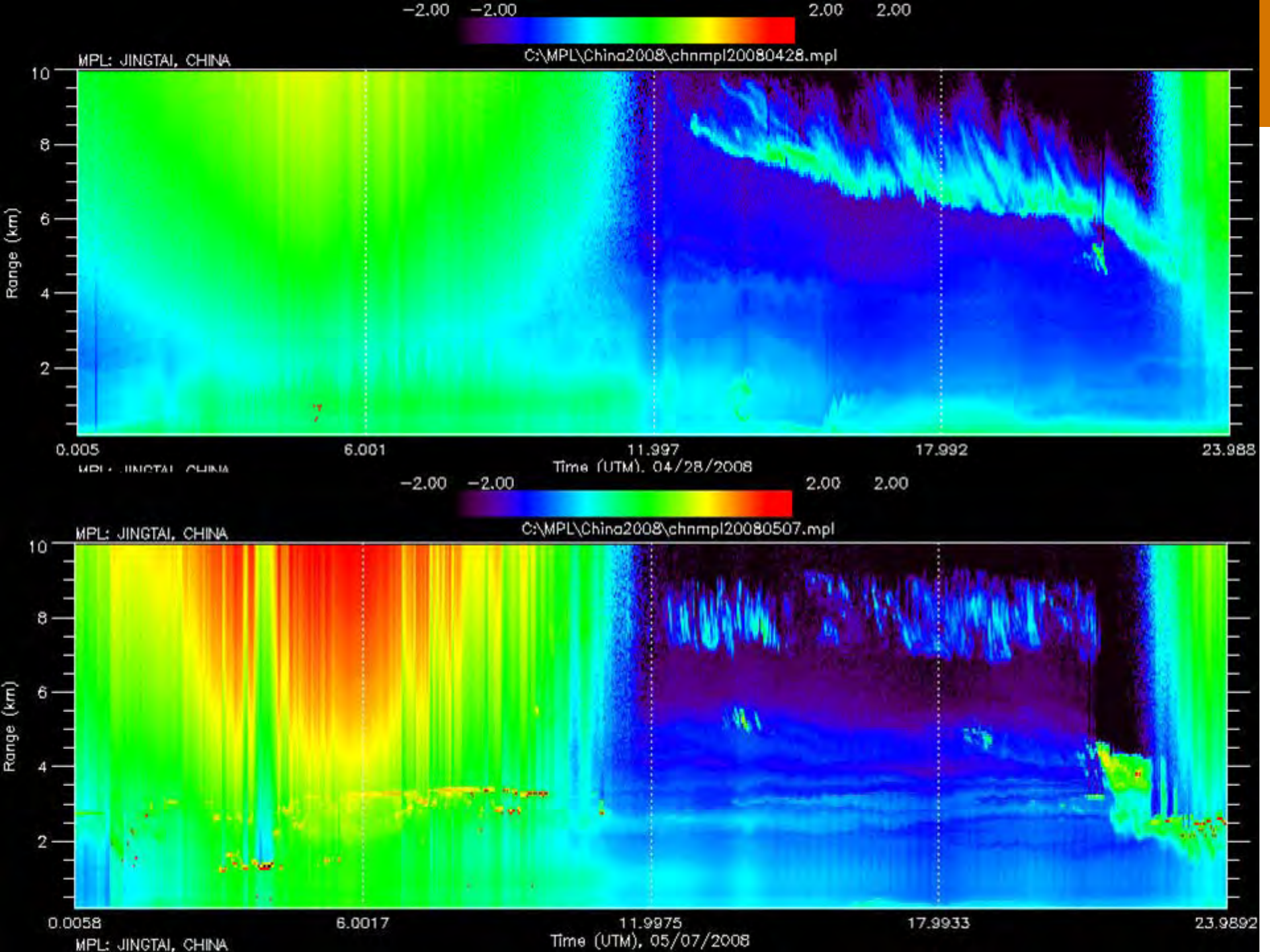
Jingtai deployment

Lidar provided by ANL, Rich Coulter

- Limited 2-month duration
- 45 days from Apr 18 – June 1 2008
- Signal was reduced
- Still has some daytime cloud detection, ~ 5 km

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6
4
2
0.005
6.001
11.997
17.992
23.988
Time (UTM), 04/28/2008
−2.00 −2.00 2.00 2.00
MPL: JINGTAI, CHINA
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4
2
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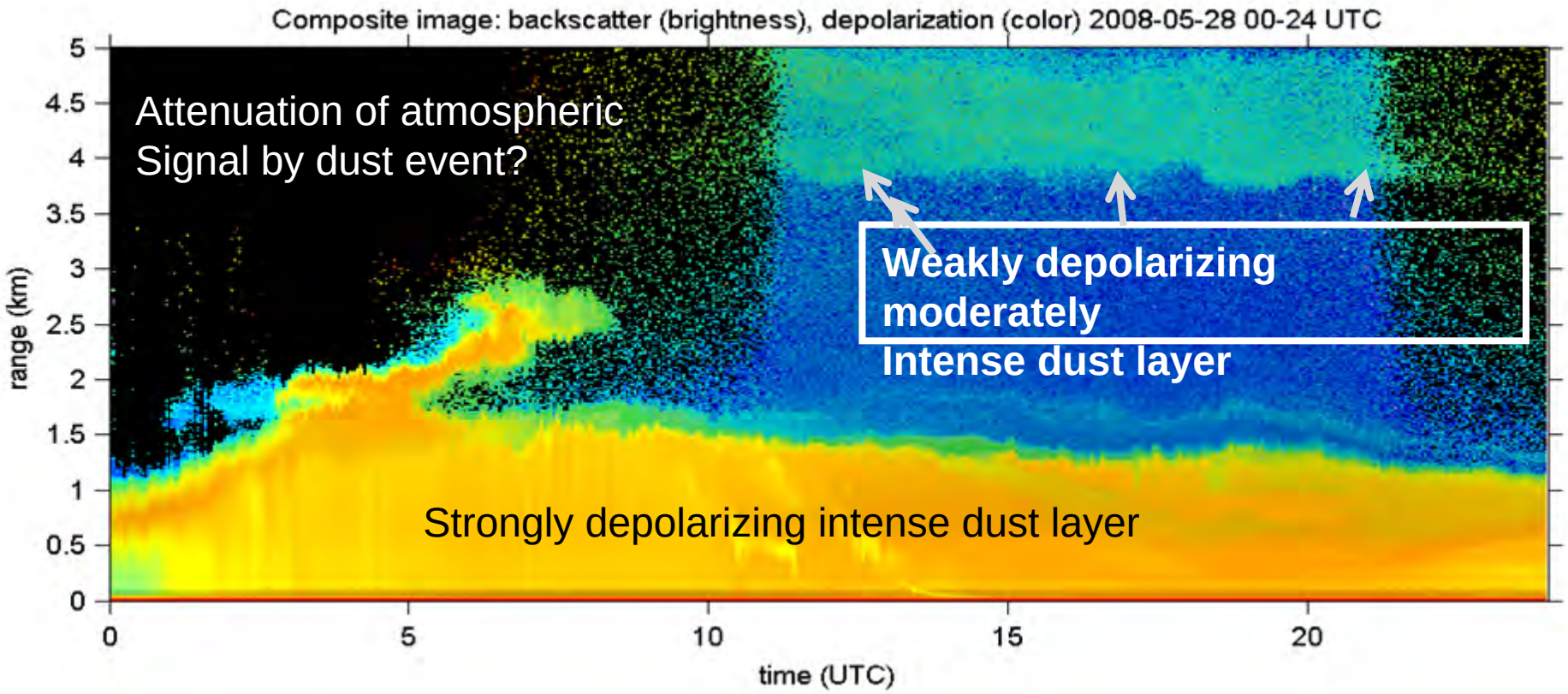
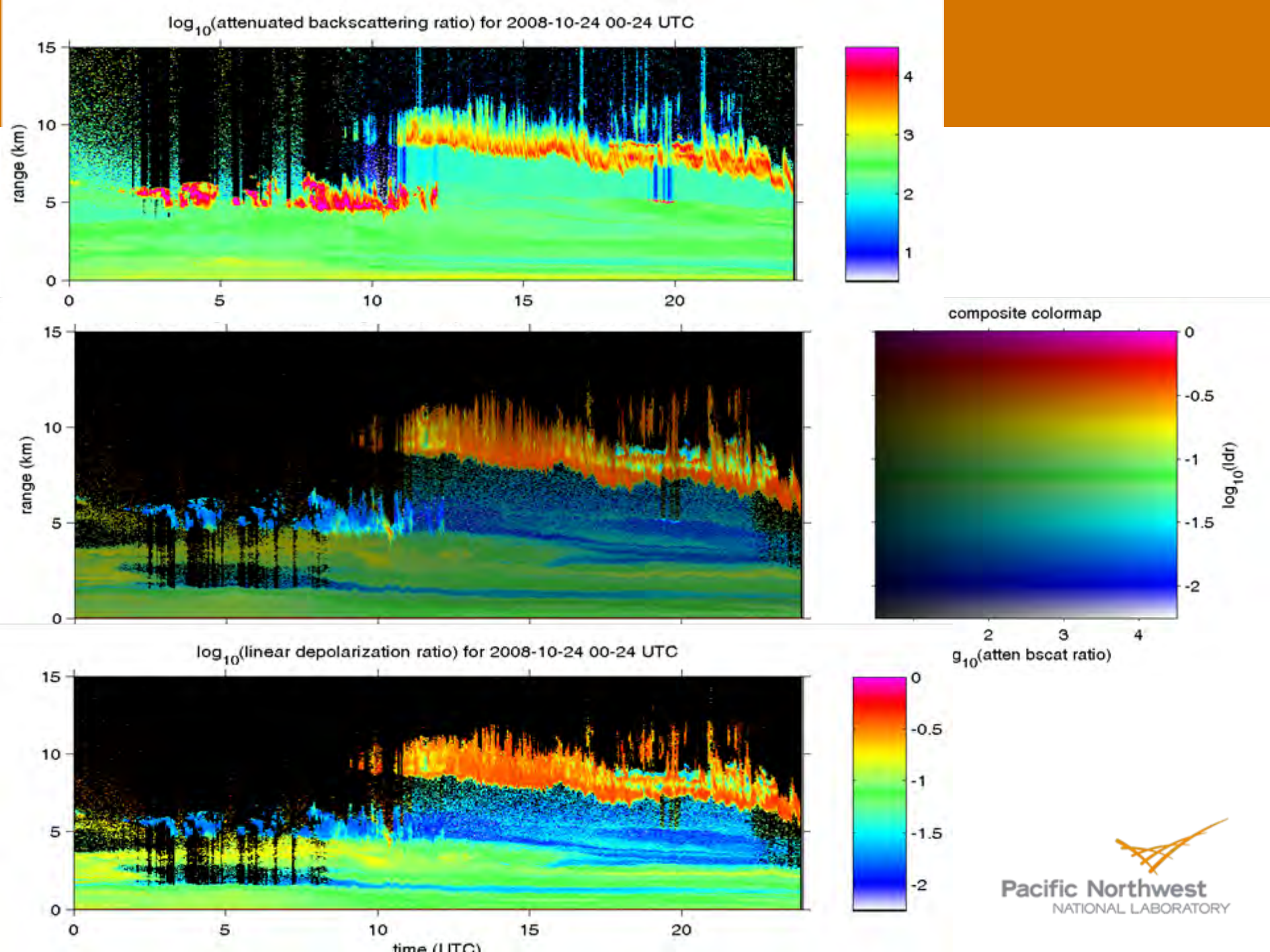
6.0017
11.9975
17.9933
23.9892
MPL: JINGTAI, CHINA
Time (UTM), 05/07/2008

Shouxian deployment

ACRF Lidar, new polarized MPL

- 228 days, May 14 to Dec. 28 2008.
- ~100% up-time
- Good signal performance





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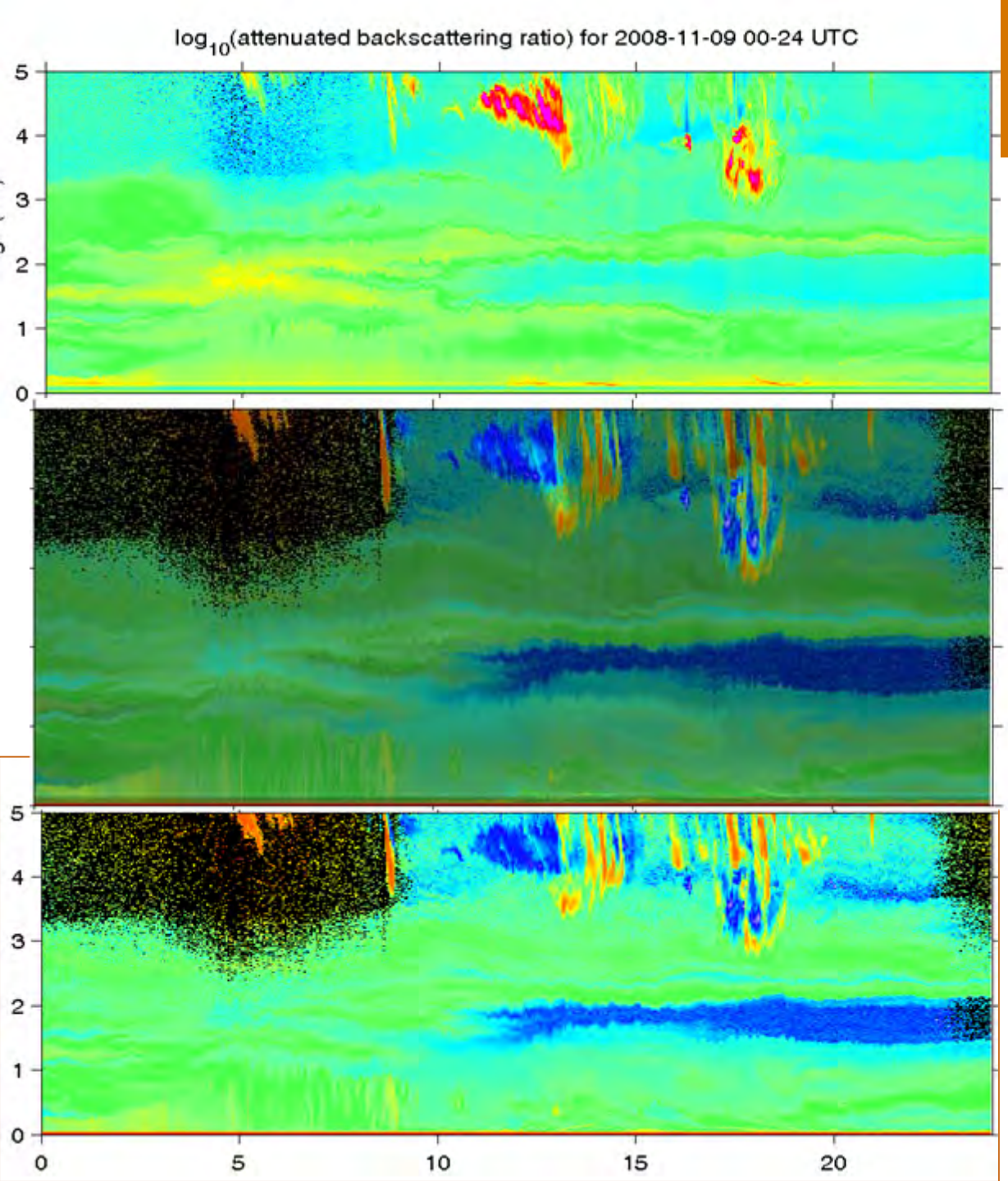

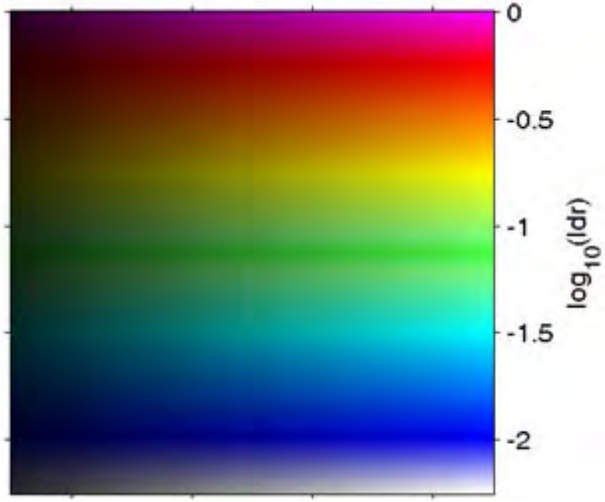

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Taihu deployment

Lidar provided by NUIST

- 325 days, Mar. 21 2008 to Feb. 11 2009.
- >88% up-time
- Some initial configuration instability.
- From May-Dec. 2008, >95% up-time
- Polarized MPL with good performance

- Used by K.H. Lee for extinction retrievals poster!

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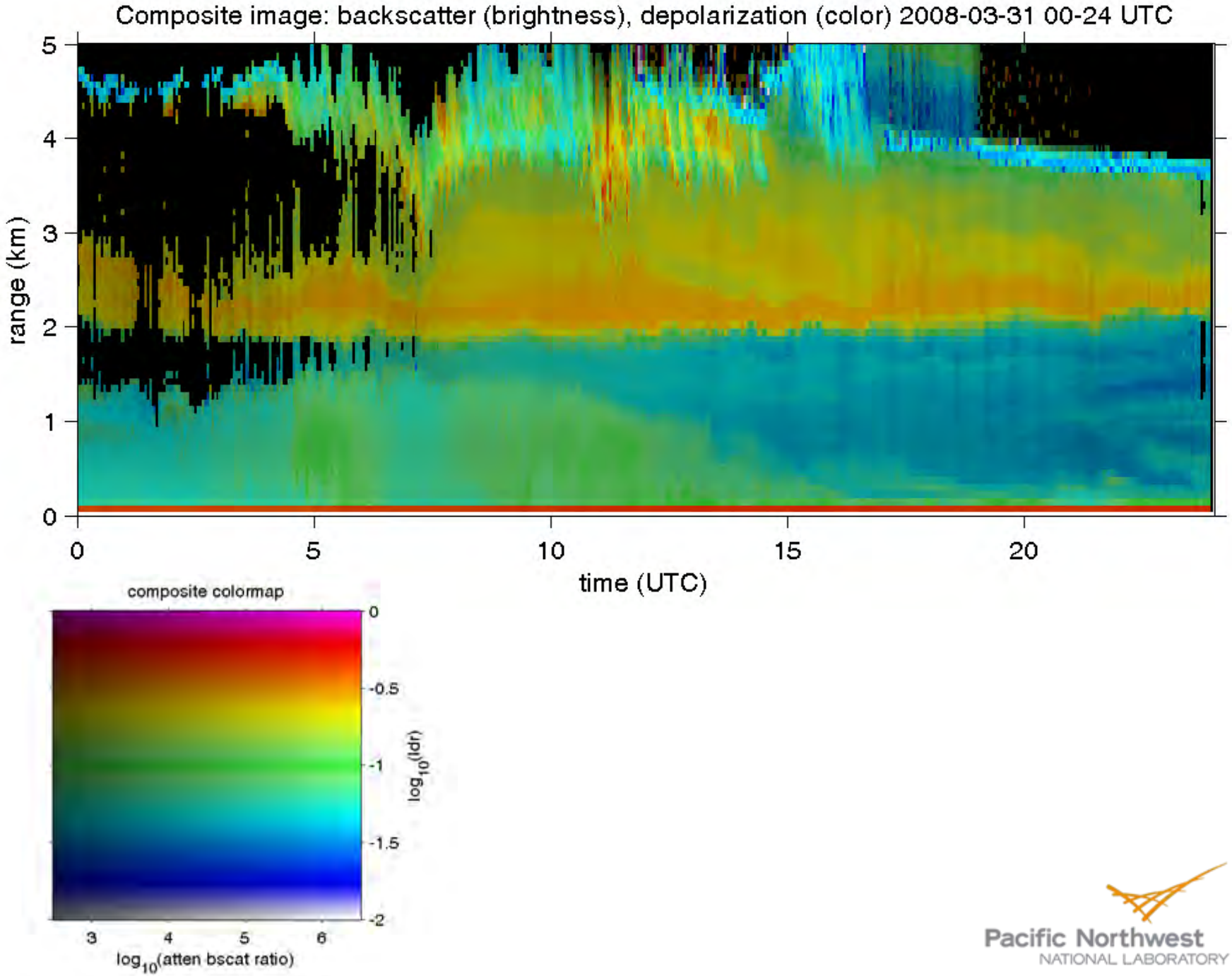

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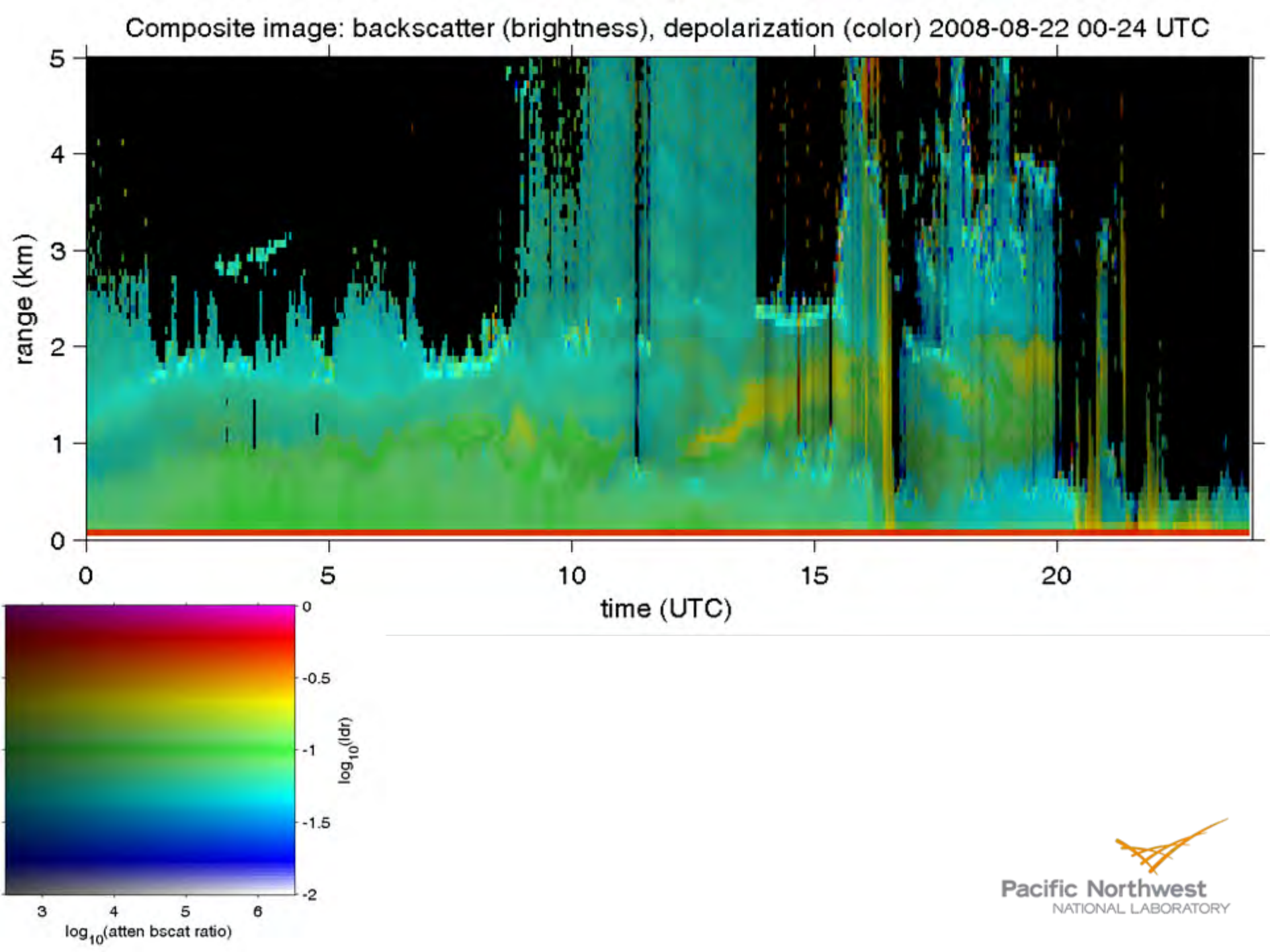

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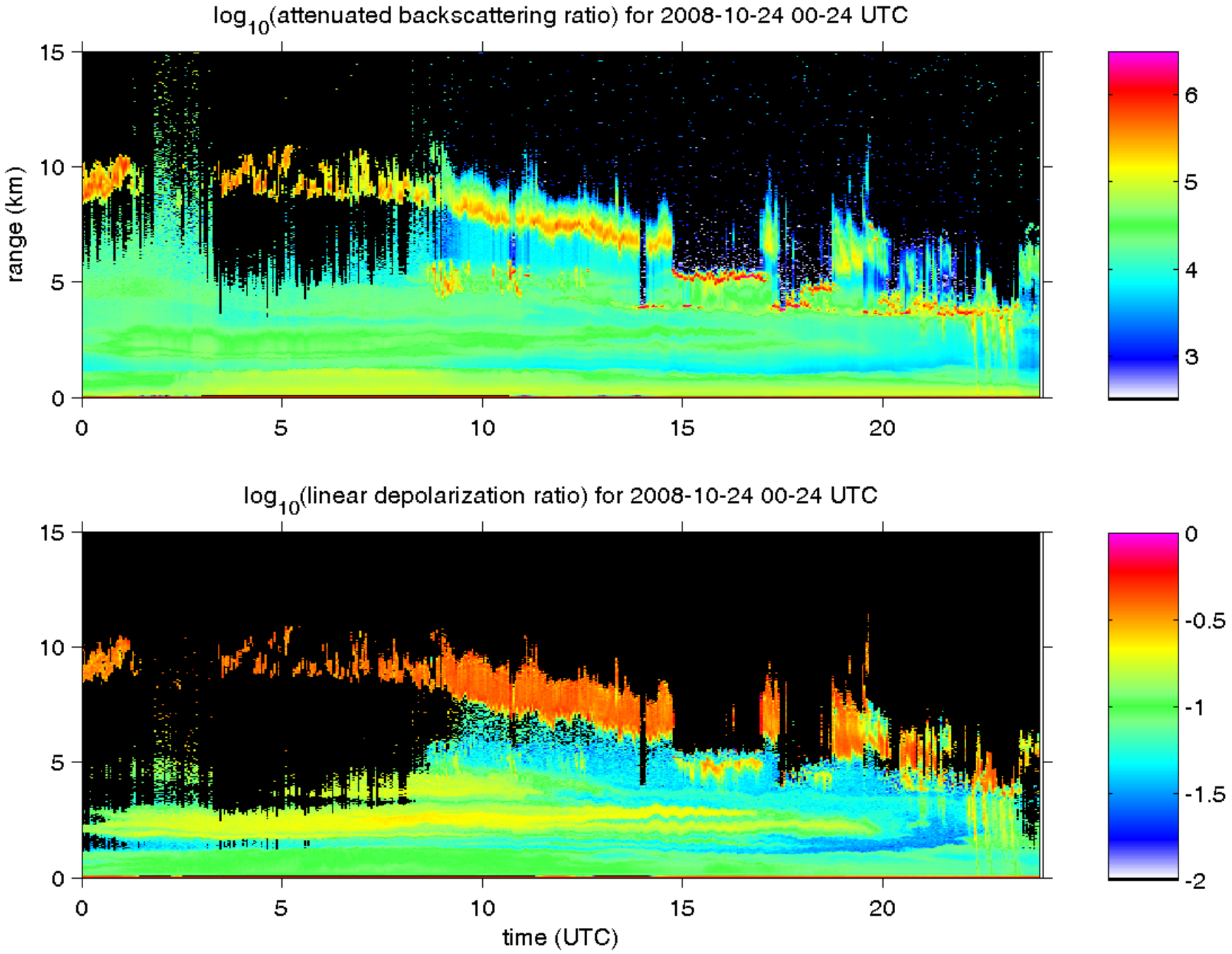
log10(attenuated backscattering ratio) for 2008-10-24 00-24 UTC
range (km)
0
5
10
15
0
5
10
15
20
6
5
4
3
log10(linear depolarization ratio) for 2008-10-24 00-24 UTC
0
-0.5
-1
-1.5
-2
time (UTC)