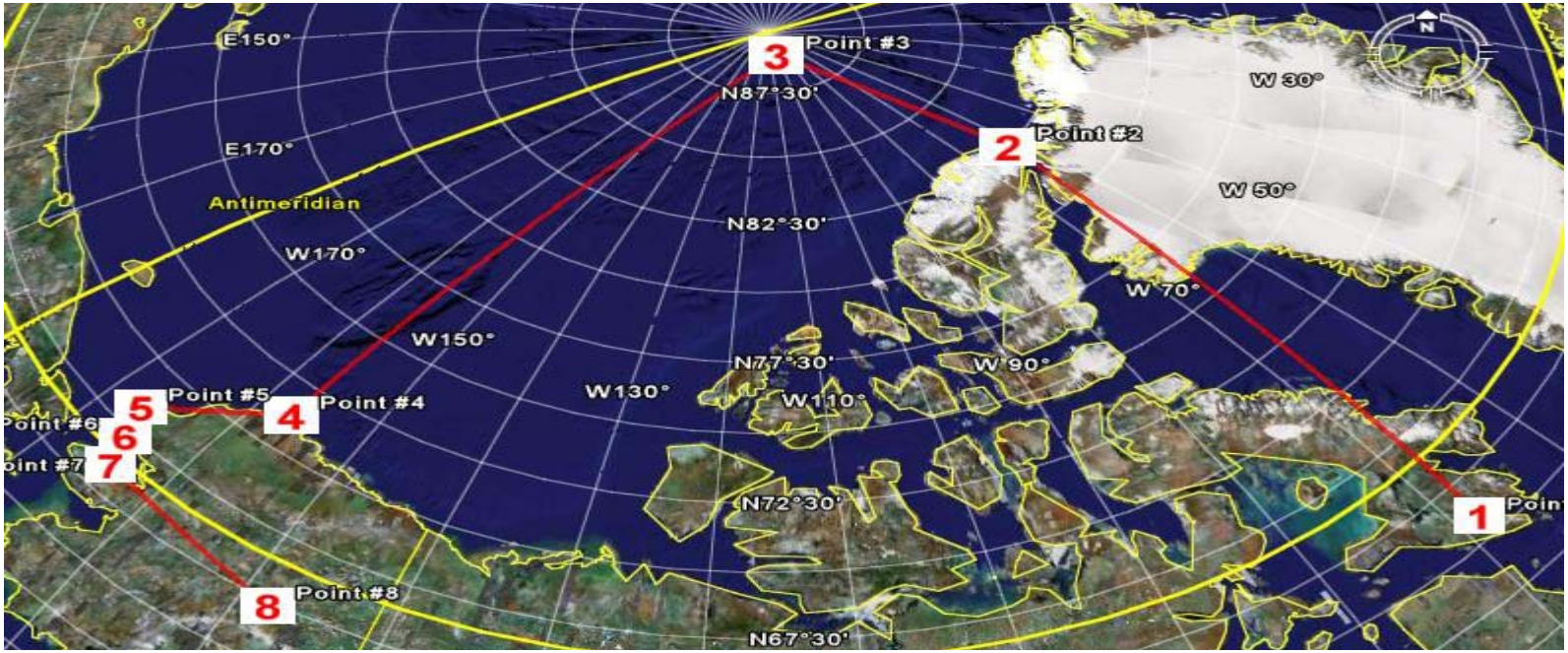
Draft Plan: Flight 07 – 04/09/2008 (version 3)



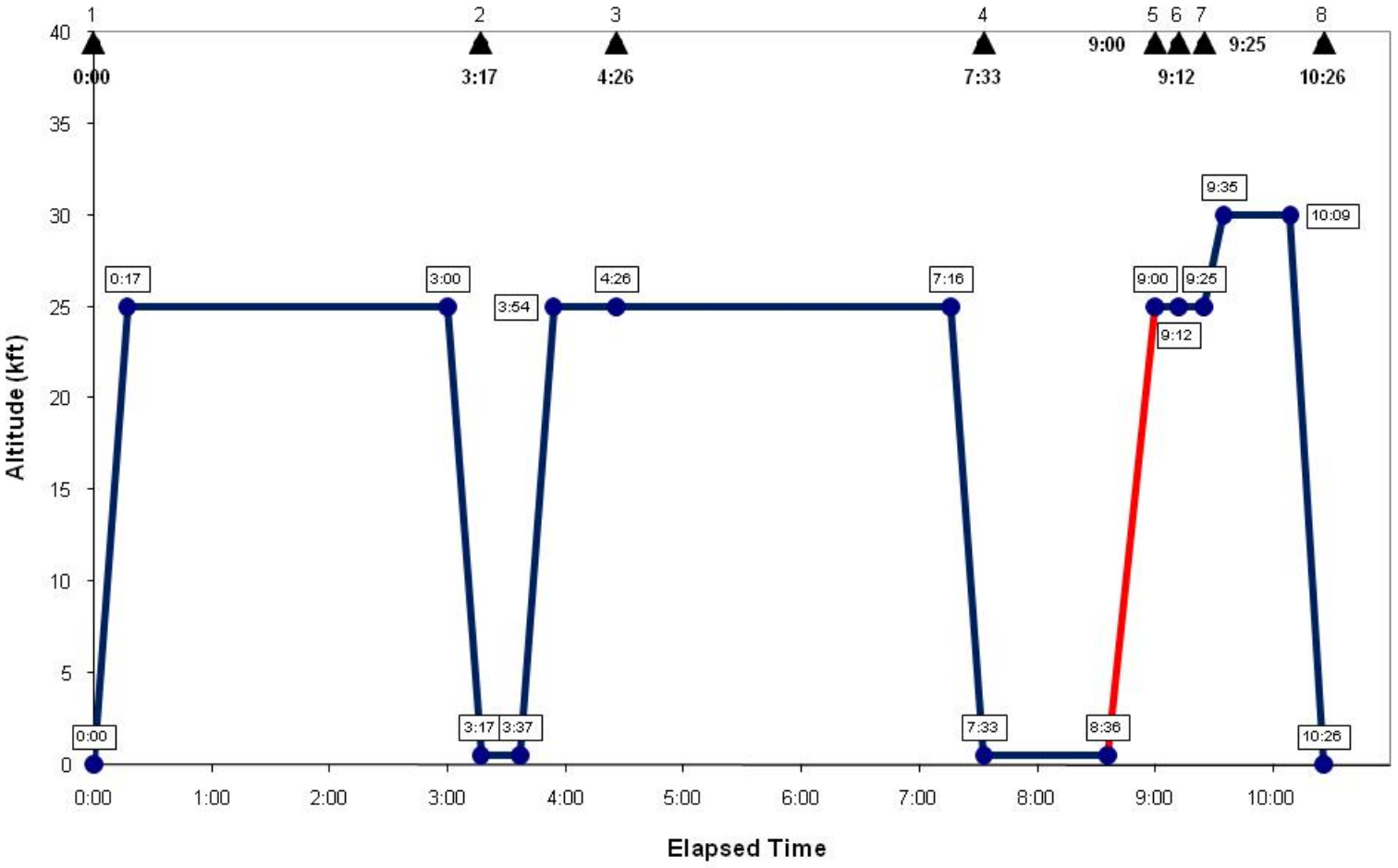
Objectives:

- aged pollution air masses – vertical profiling (points 1-2)
- 20-min MBL run north of Alert (point 2)
- OMI ozone validation track (using DIAL) - vertical profiling (points 3-4)
- aged pollution air masses – vertical profiling (points 2-4)
- missed approach at Barrow and rendez-vous with B-200 (point 4)
- MBL run (points 4-5)
- partial spiral at point 5 – serves as delay while B-200 catches up with us at point 6
- CALIPSO underpass, coordinated with B-200 (points 5-7)
- Vertical profiling, aged European pollution (points 7-8)

Points	Location	Latitude	Longitude	Time GMT
1	Iqaluit	63.45	-68.33	14:13
2	Alert	82.48	-62.25	17:30
3	Arctic Ocean	89	-100	18:39
4	Point Barrow	71.3	-156.780	21:46
5	Calipso Track	68.37	-166.79	23:13
6	Calipso Val Pt.	67.25	-165.50	23:25:50
7	Caplipso Track	66.12	-164.31	23:38
8	Fairbanks	64.820	-147.870	24:39

- **Estimated flight duration: 10:26**
- **Estimated Take-off time: 14:13 GMT**
- **Target landing time: 16:40 ADT or 00:40 GMT**
- **Missed-Approach at Barrow: 21:46 GMT**
- **Calipso Validation Point: 23:25:50 GMT at 67.2526N and 162.4997W**

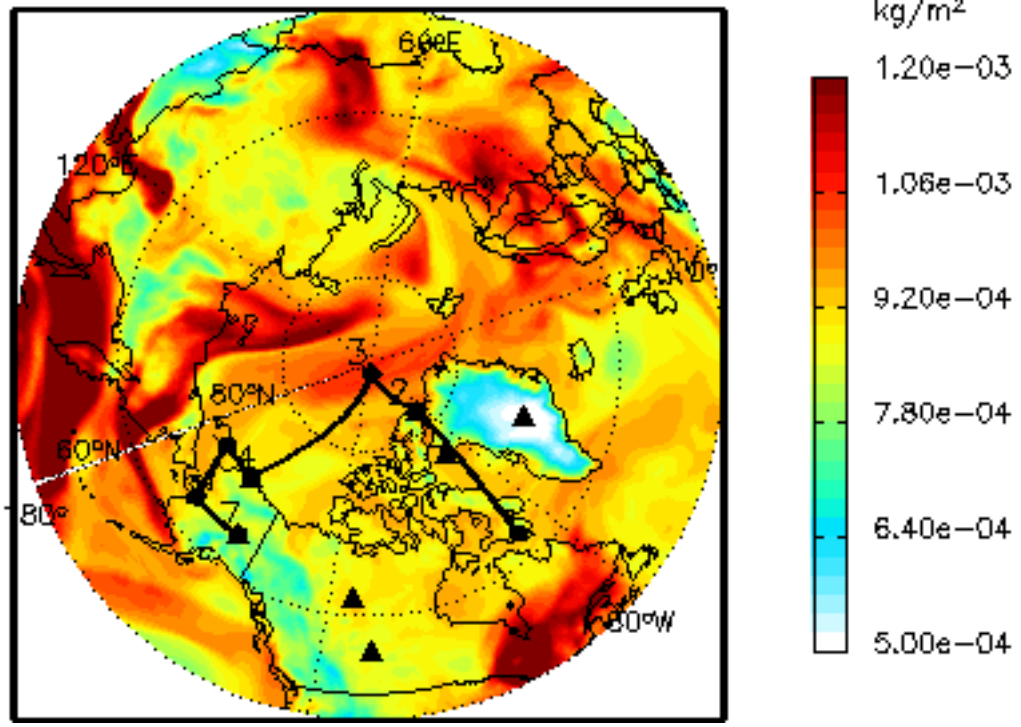
HARD TIMES: rendez-vous with B-200 at points 4 and 6.



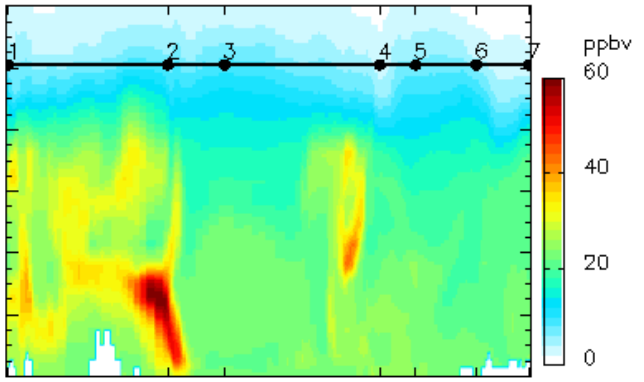
Note: In-Progress profiling in **Blue**; Spirals in **Red**; Way points annotated with triangles (▲).

GEOS5 Forecast – 4/9/2008 – 16:30Z

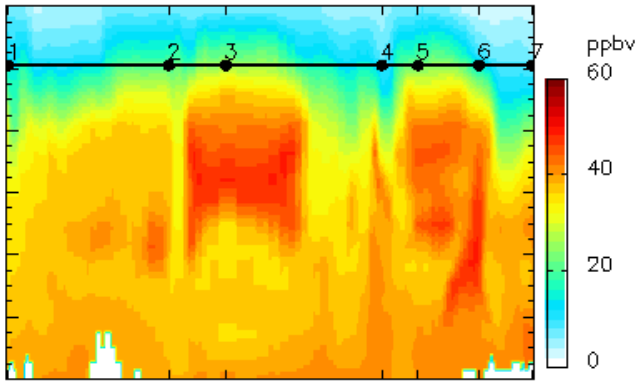
Total CO (500 hPa)



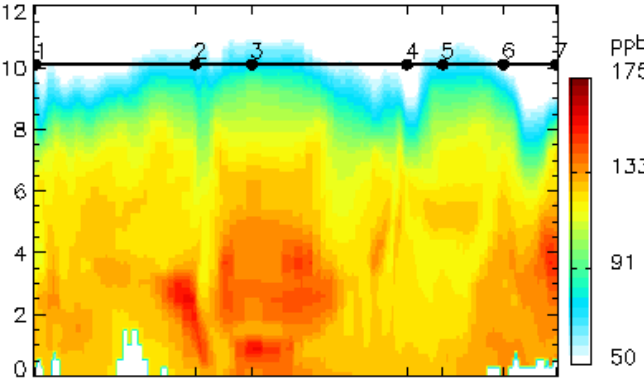
North American CO



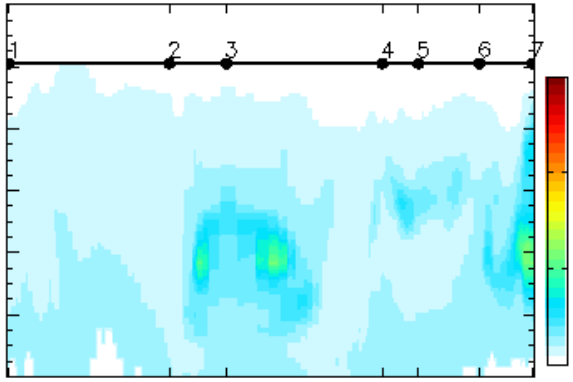
Asian CO



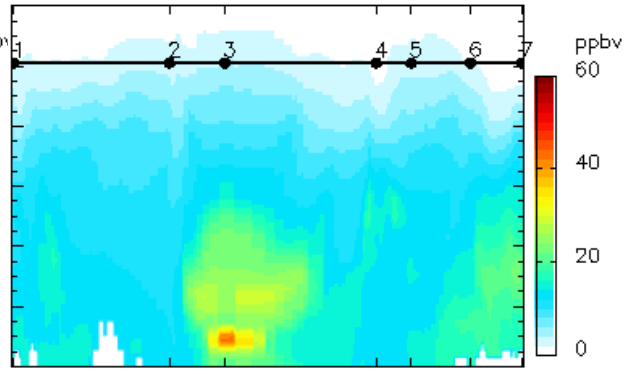
Total CO



Boreal burning CO



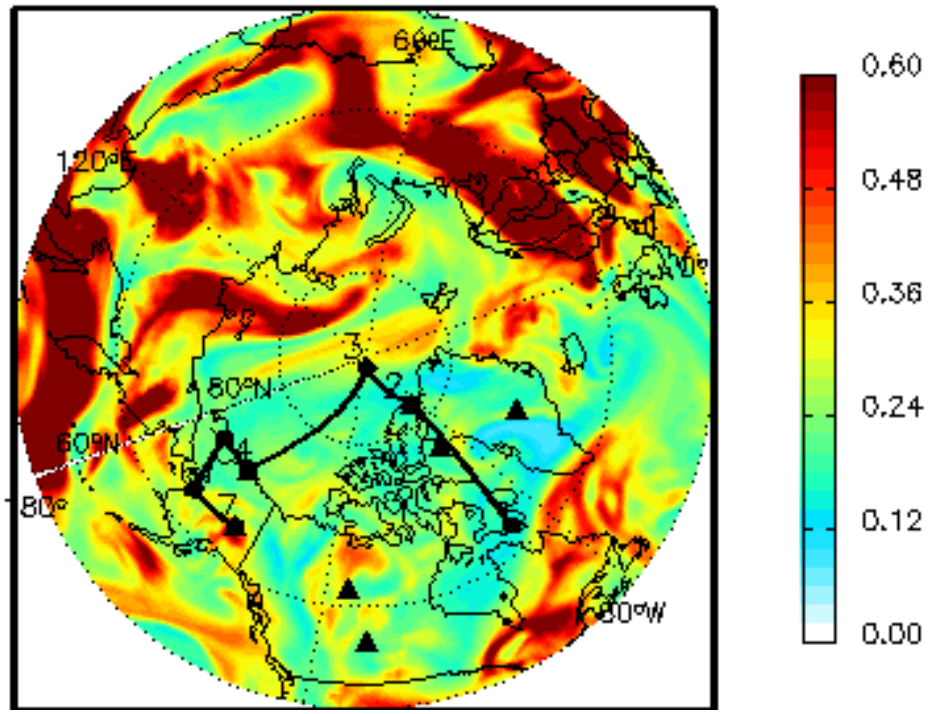
European CO



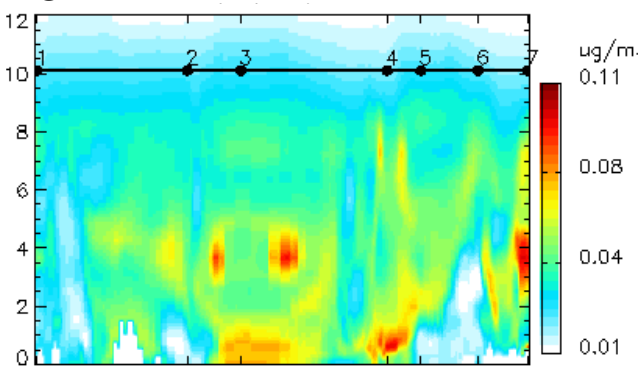
Initialized 4/8/2008 – 12Z

GEOS5 Forecast – 4/9/2008 – 16:30Z

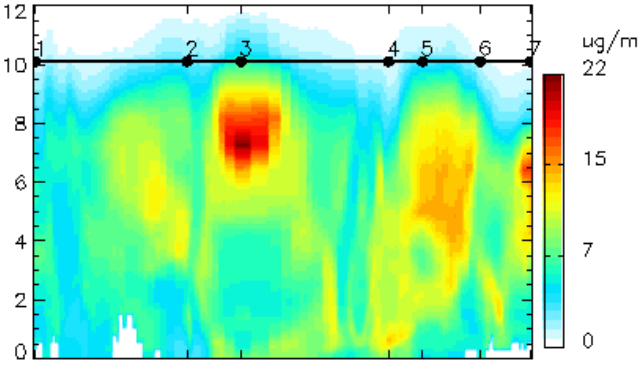
Total AOT (550 nm)



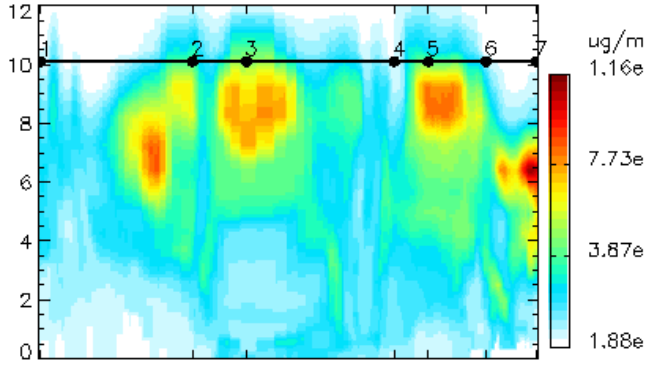
BC



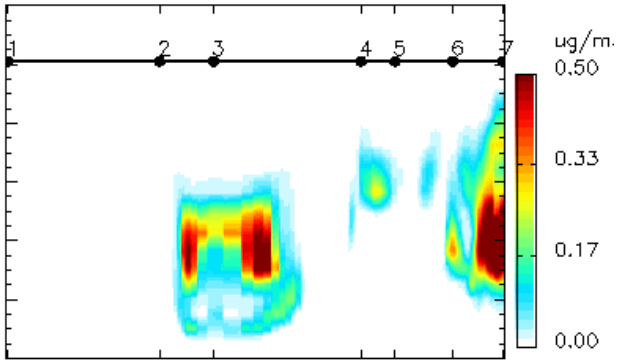
Dust



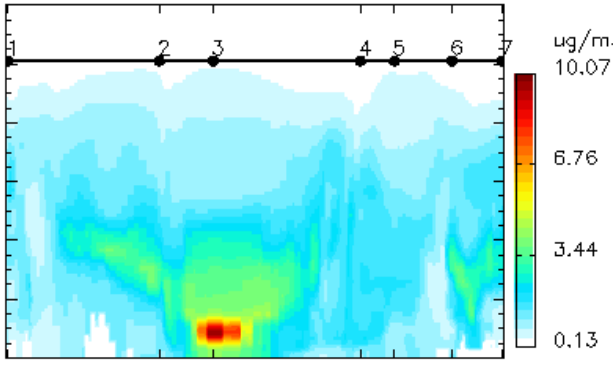
Nonboreal BB OC



Boreal BB OC

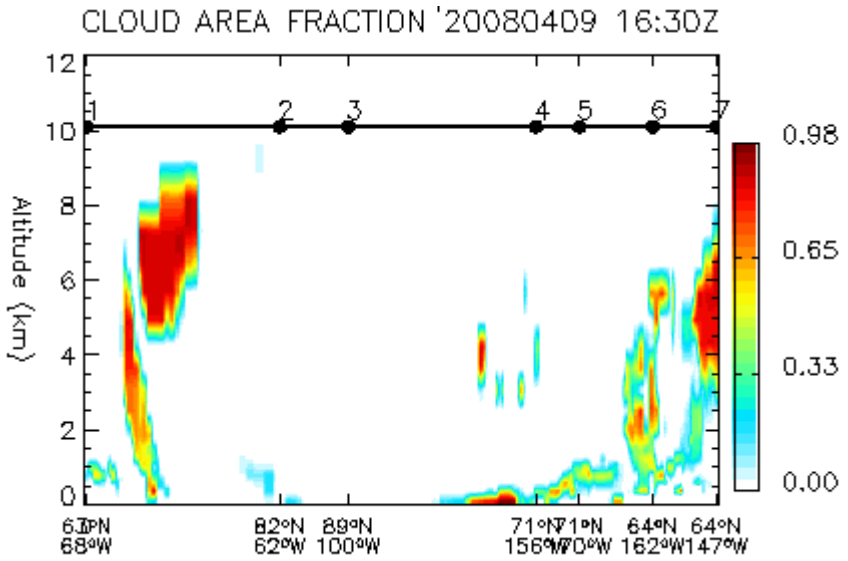


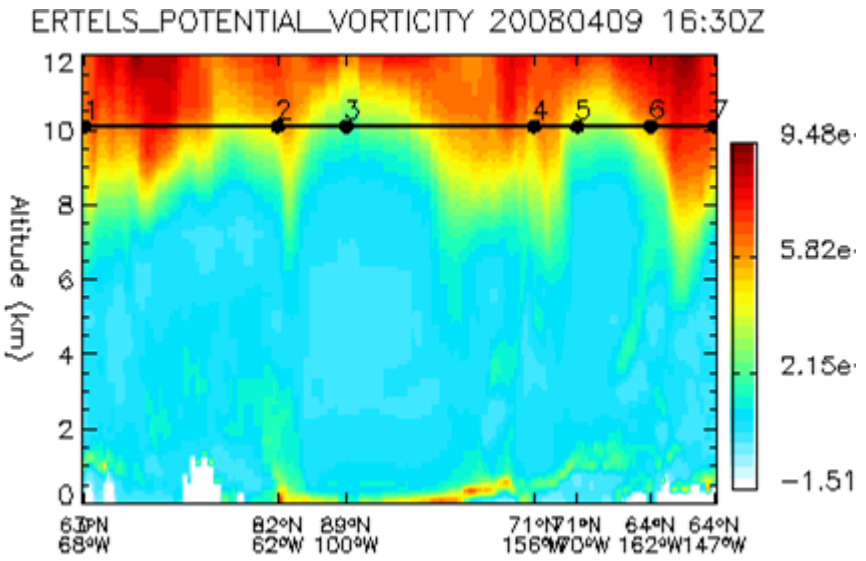
Sulfate



Initialized 4/8/2008 – 12Z

GEOS5 Forecast – 4/9/2008 – 16:30Z

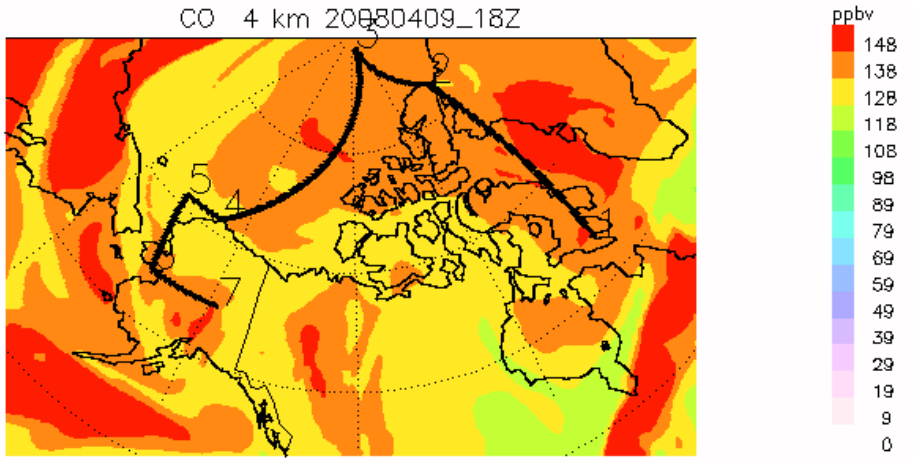


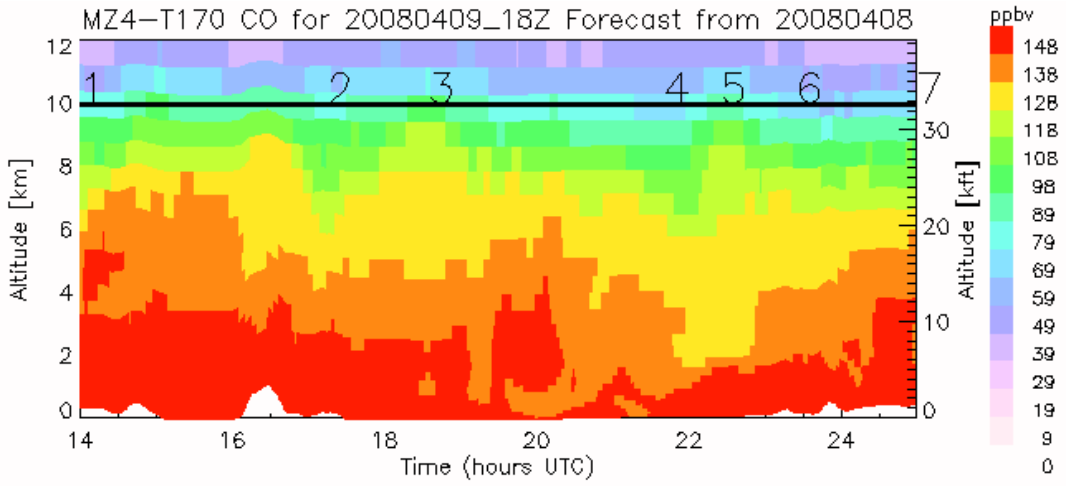


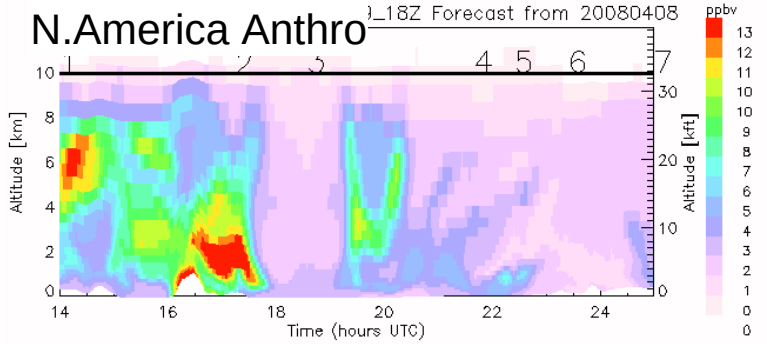
Initialized 4/8/2008 – 12Z

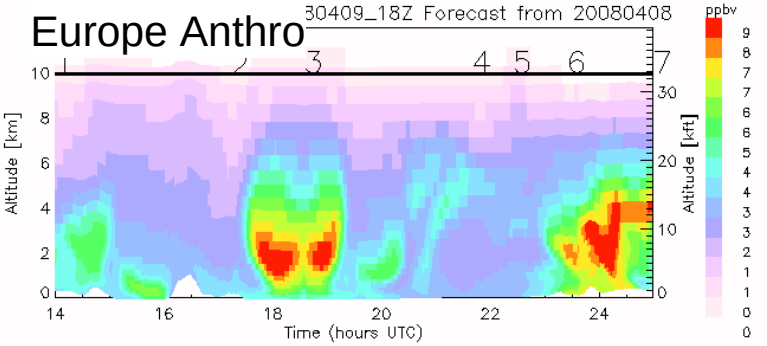
Apr 9 Iqaluit-Fairbanks

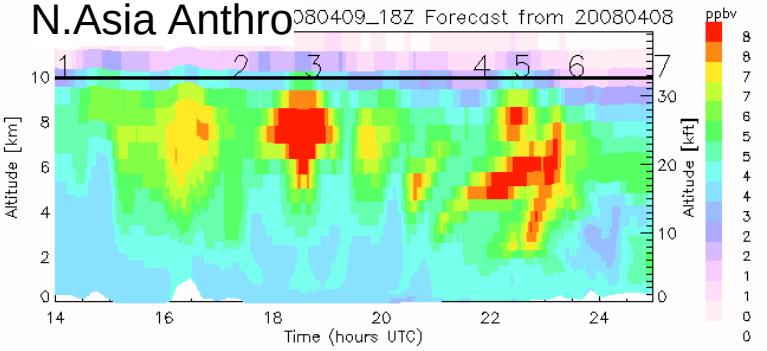
MZ4 forecast from Apr 8 for Apr 9 18Z

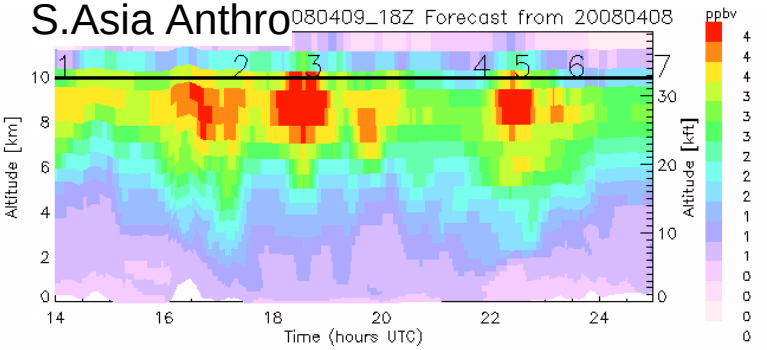








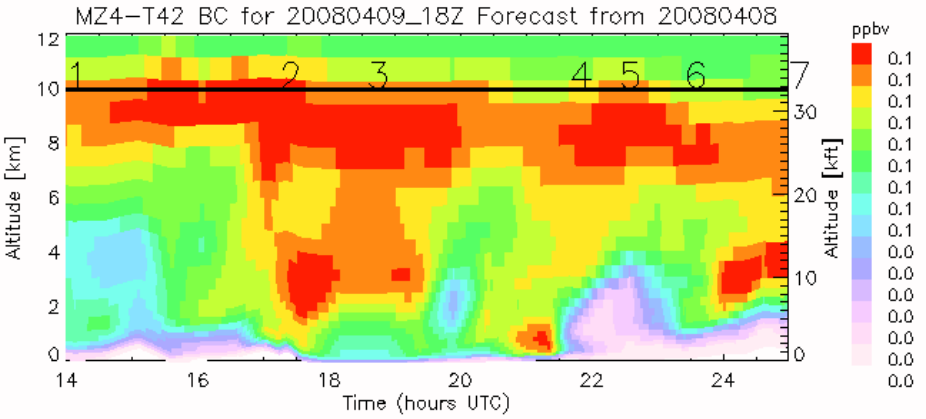




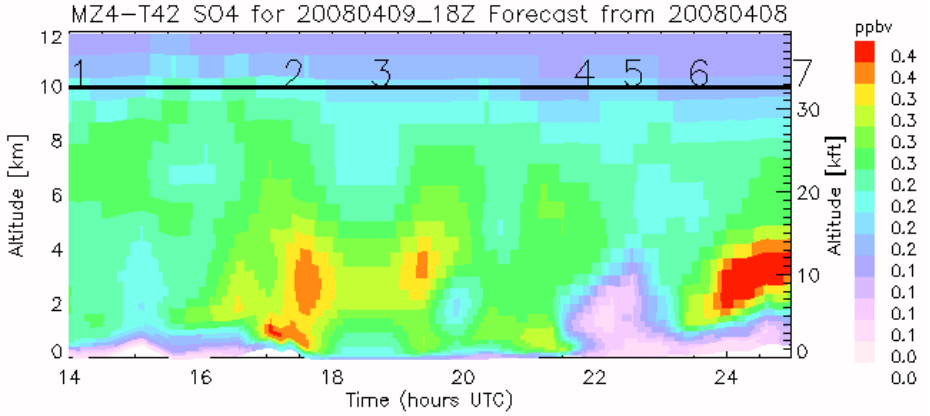
Apr 9 Iqaluit-Fairbanks

MZ4 forecast from Apr 8 for Apr 9 18Z

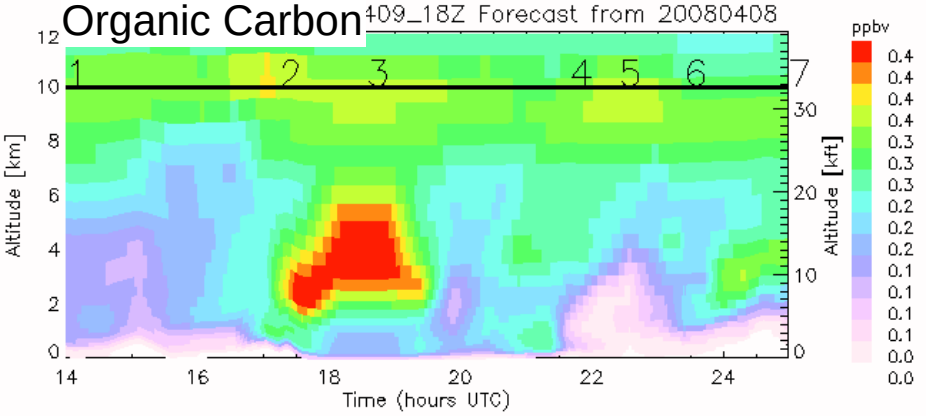
Black Carbon

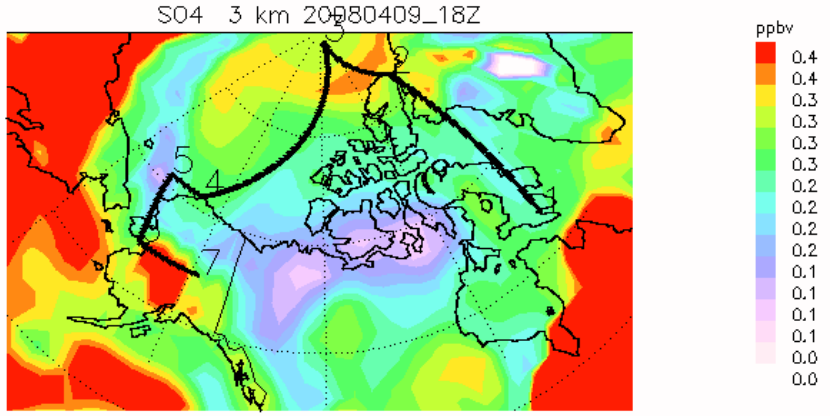


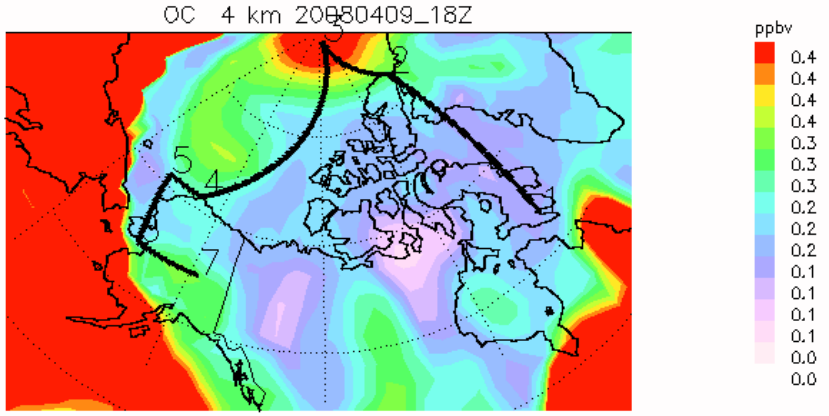
SO4



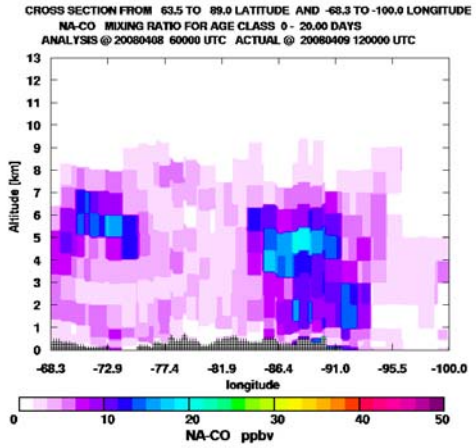
Organic Carbon

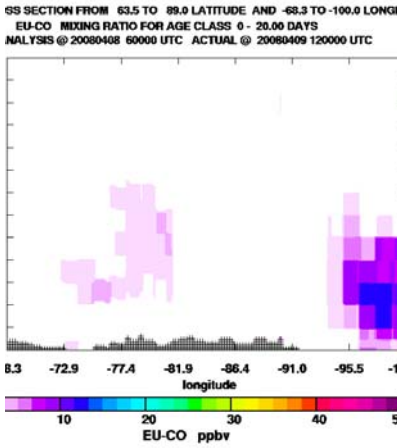


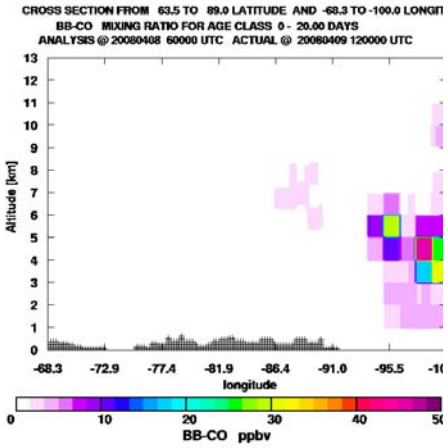


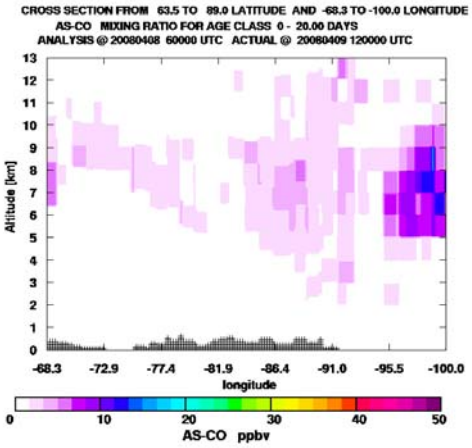


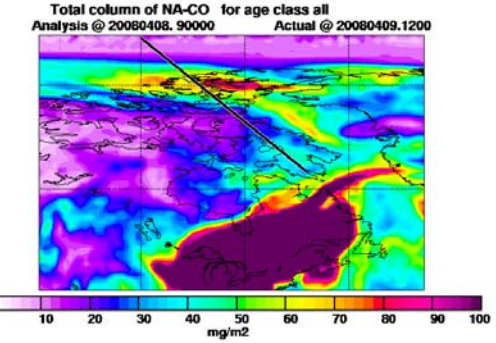
FLEXPART fc for new leg 1, 12Z 9 Apr

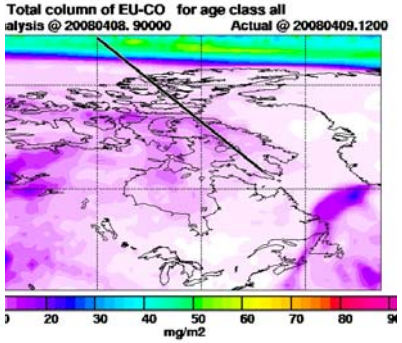


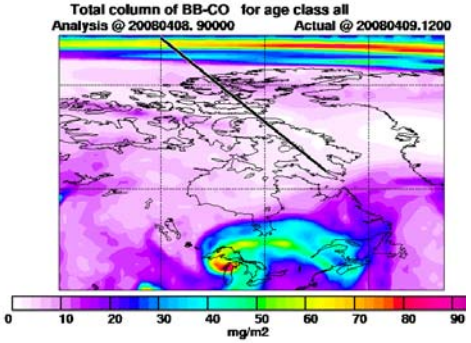


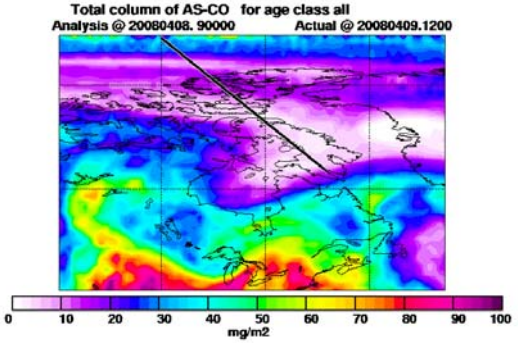




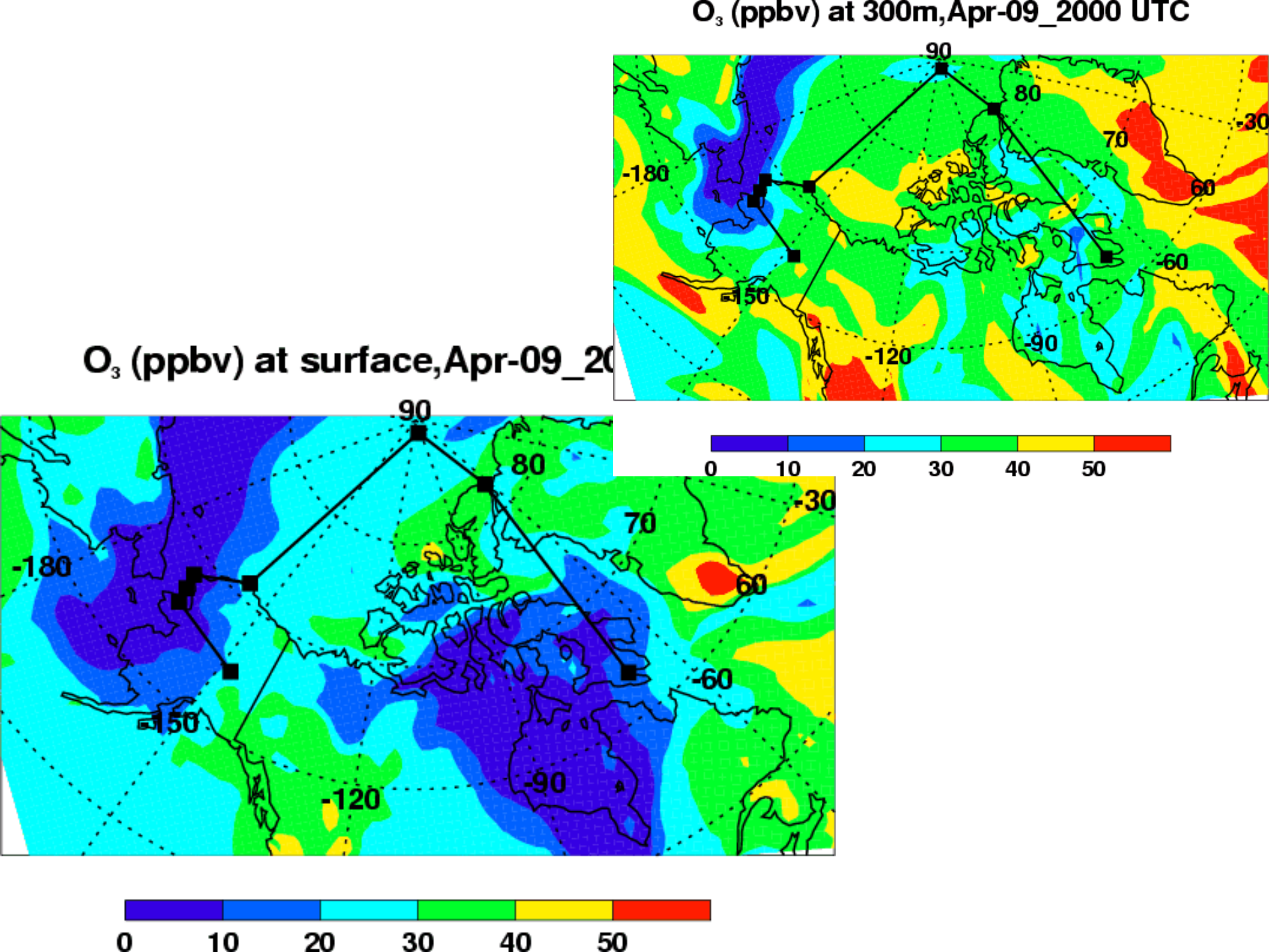


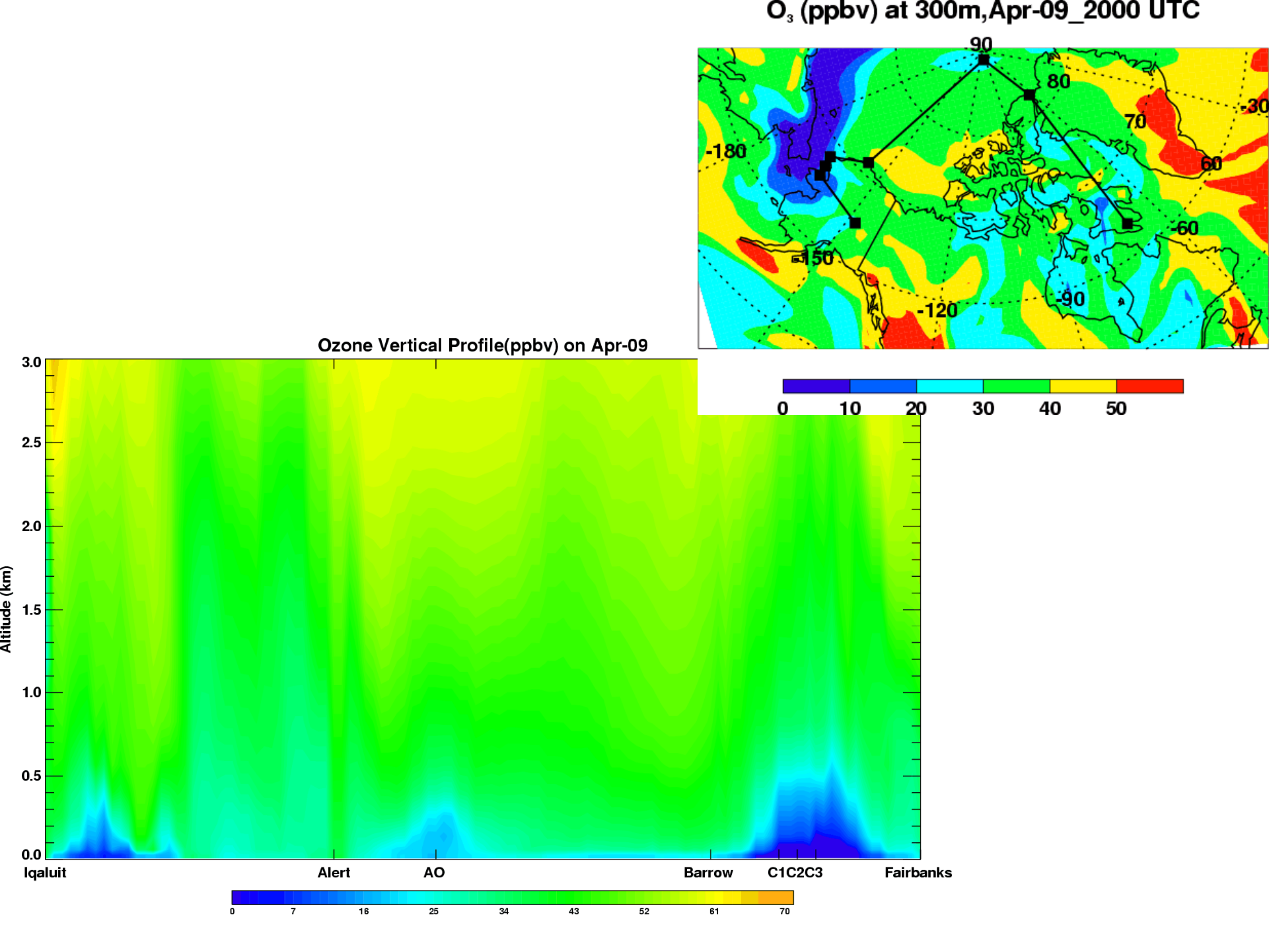




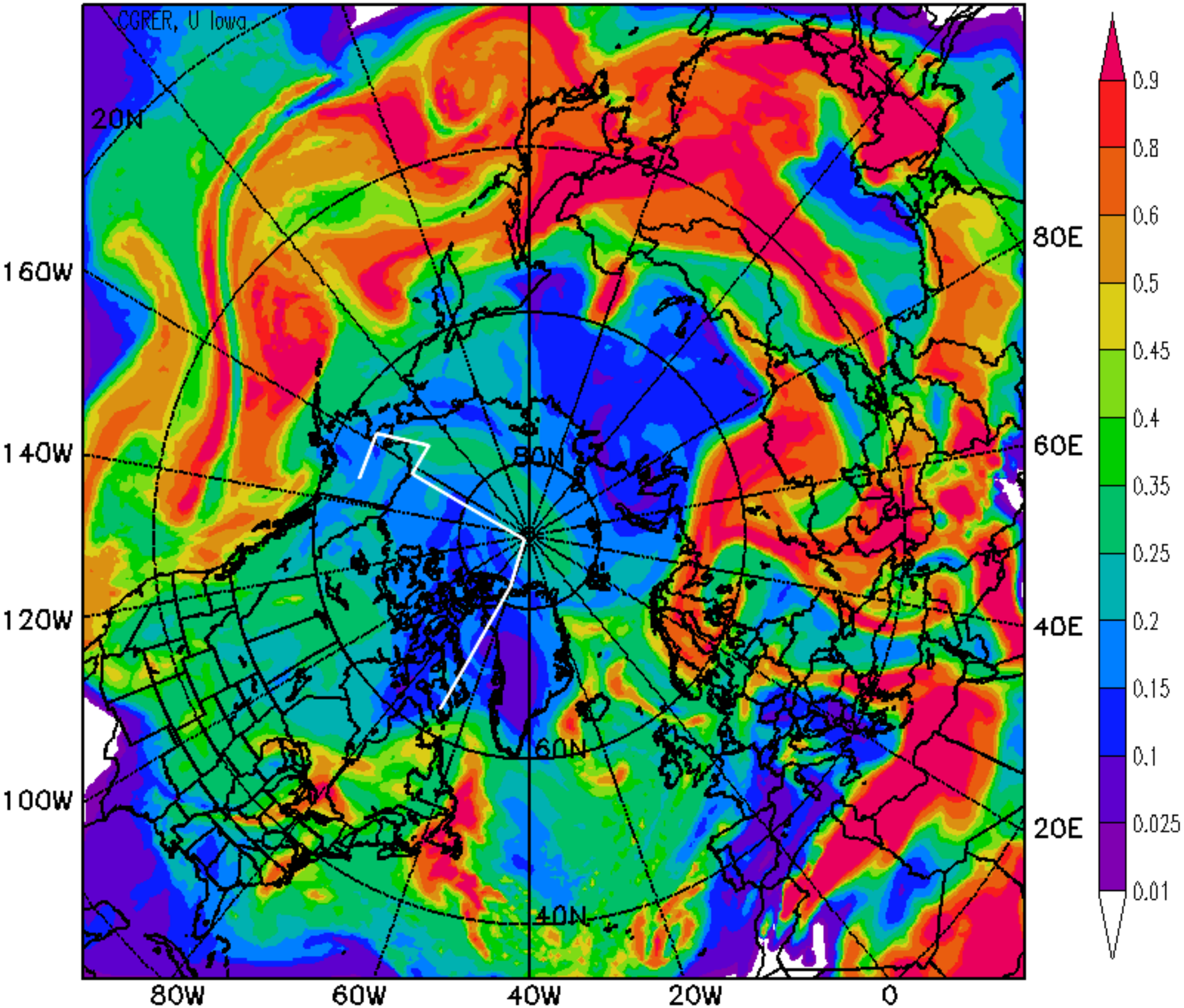


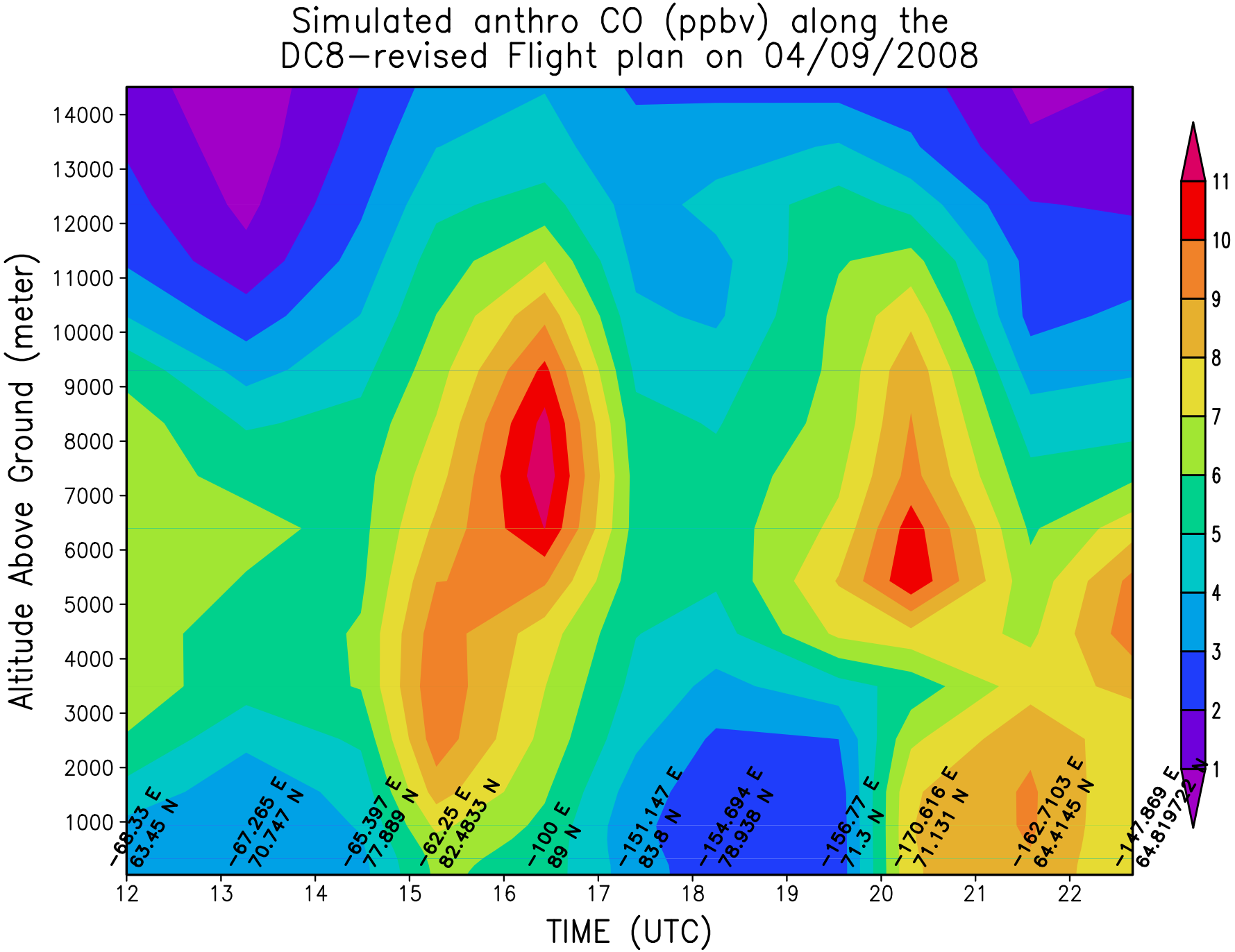
NA-CO EU-CO BB-CO AS-CO

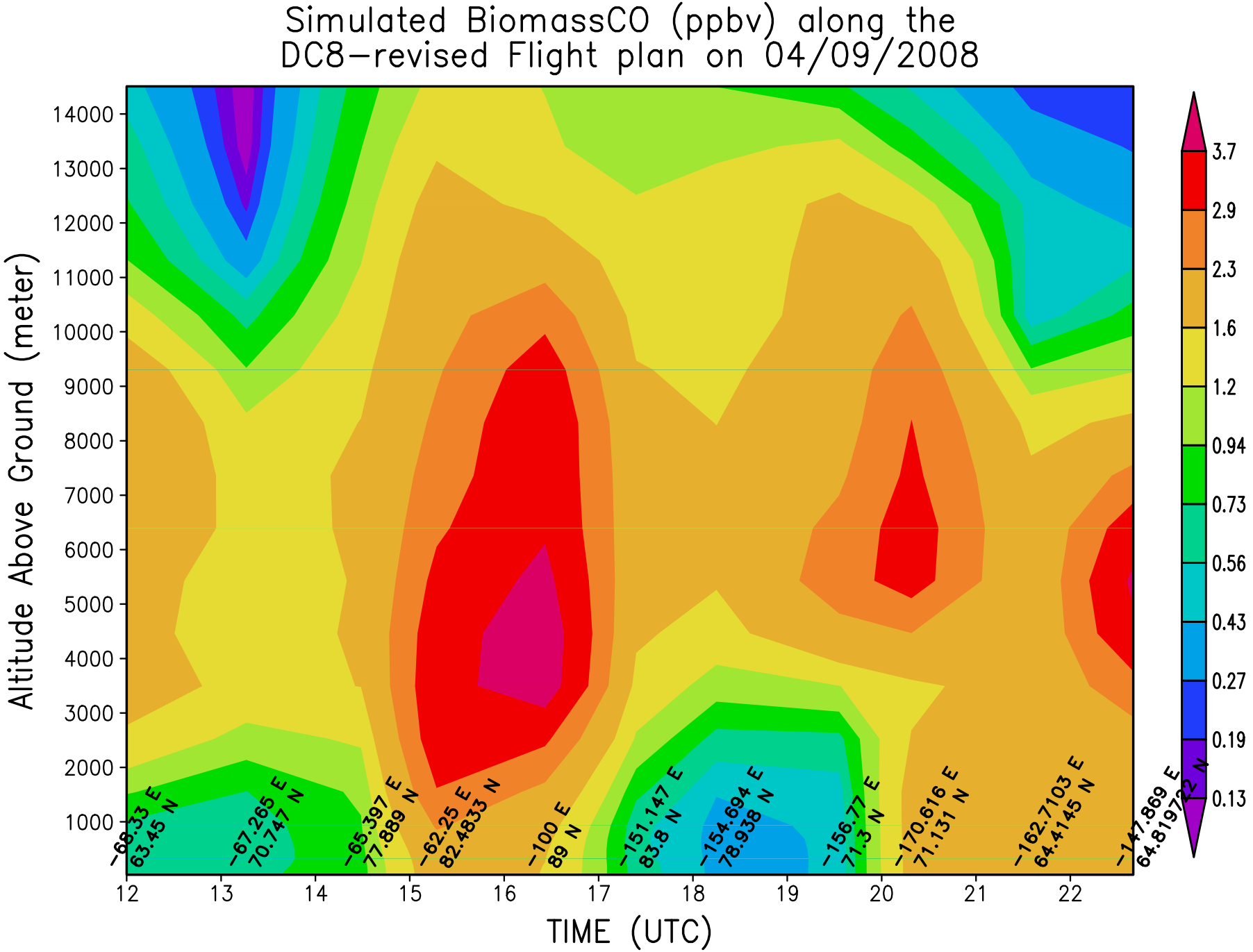

O3 (ppbv) at 300m,Apr-09_2000 UTC
90
80
70
-30
-180
60
-60
-150
-90
-120
0
10
20
30
40
50
O3 (ppbv) at surface,Apr-09_20
90
80
70
-30
-180
60
-60
-150
-90
-120
0
10
20
30
40
50

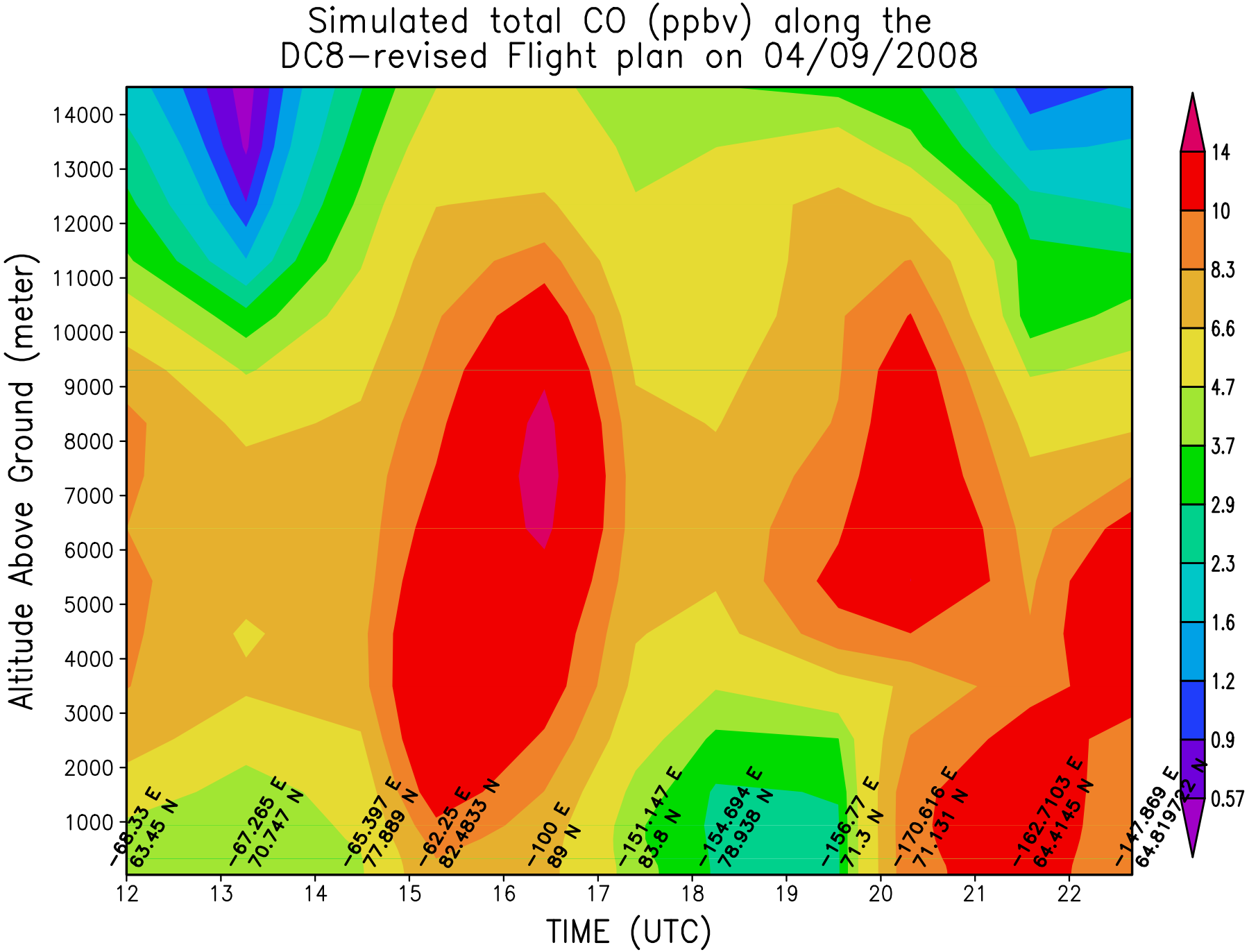

O3 (ppbv) at 300m,Apr-09_2000 UTC
90
80
70
60
-30
-60
-90
-120
-150
-180
0
10
20
30
40
50
Ozone Vertical Profile(ppbv) on Apr-09
Altitude (km)
3.0
2.5
2.0
1.5
1.0
0.5
0.0
Iqaluit
Alert
AO
Barrow
C1C2C3
Fairbanks
0
7
16
25
34
43
52
61
70

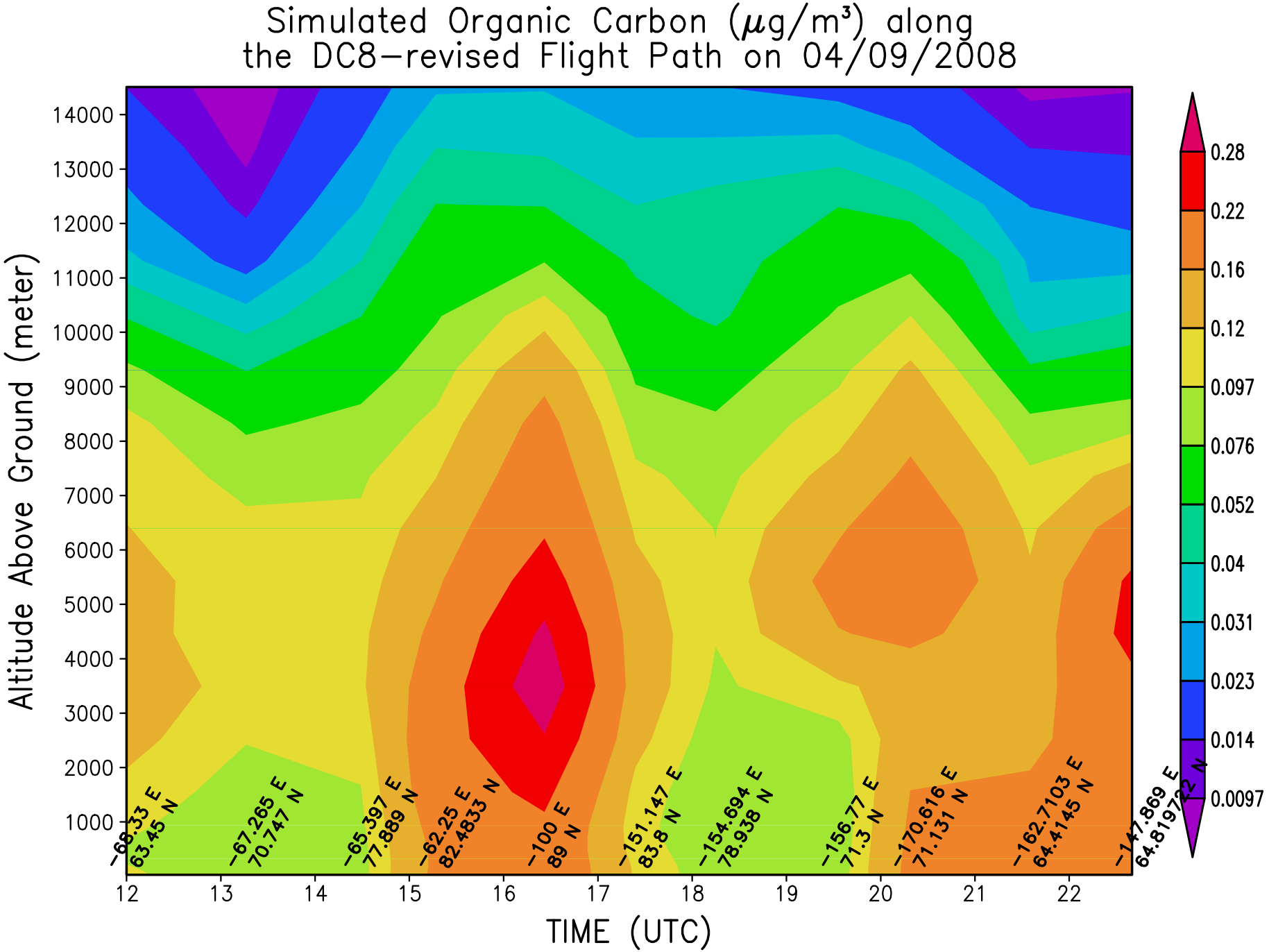
Simulated Column TOTAL_Aerosol_Optical_Depth at 12UTC, 04/9/2008

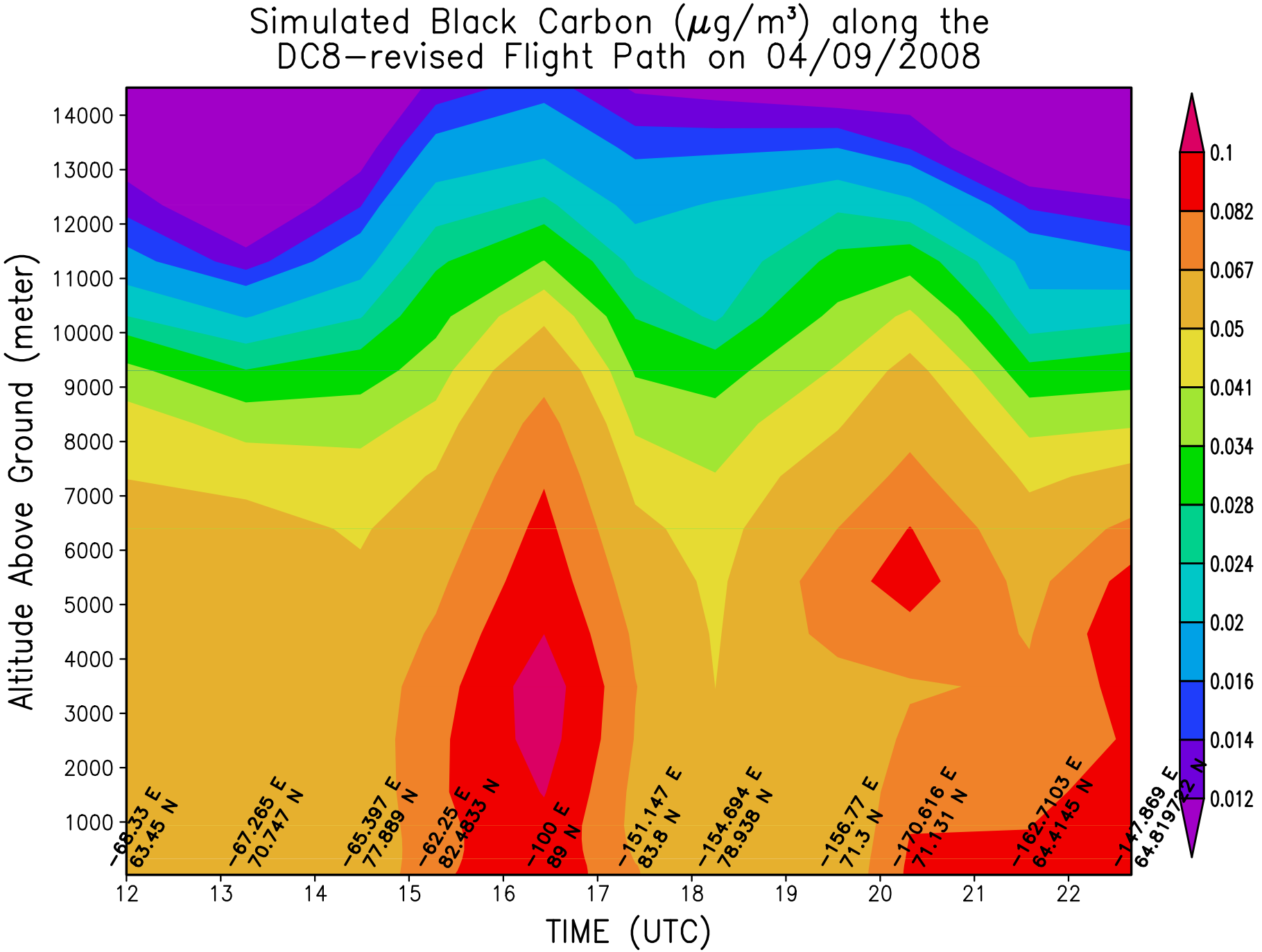


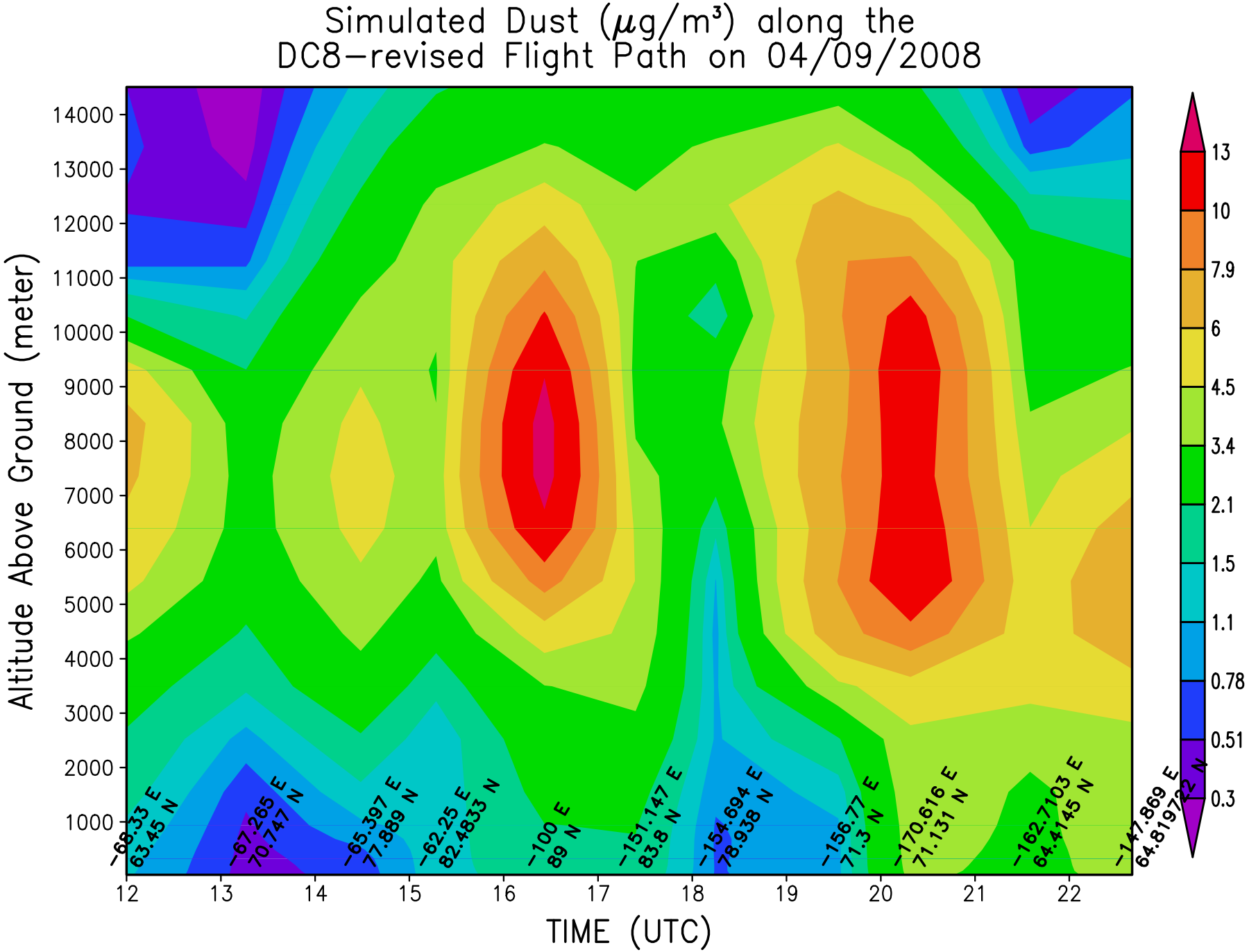

Simulated anthro CO (ppbv) along the
DC8–revised Flight plan on 04/09/2008
Altitude Above Ground (meter)
14000
13000
12000
11000
10000
9000
8000
7000
6000
5000
4000
3000
2000
1000
12
13
14
15
16
17
18
19
20
21
22
TIME (UTC)
-68.33 E
63.45 N
-67.265 E
70.747 N
-65.397 E
77.889 N
-62.25 E
82.4833 N
-100 E
89 N
-151.147 E
83.8 N
-154.694 E
78.938 N
-156.77 E
71.3 N
-170.616 E
71.131 N
-162.7103 E
64.4145 N
-147.869 E
64.819722 N
11
10
9
8
7
6
5
4
3
2
1

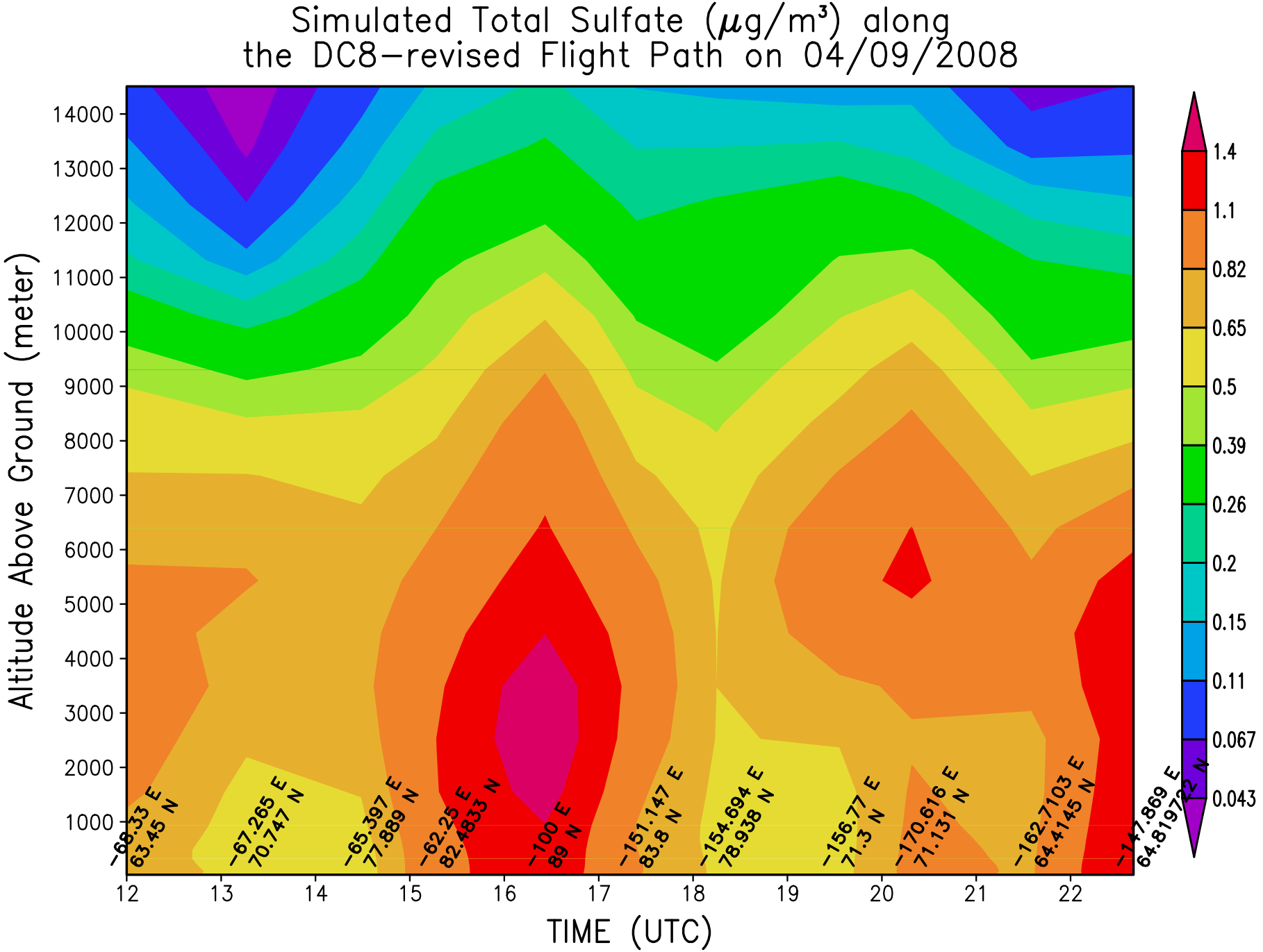

Simulated BiomassCO (ppbv) along the
DC8–revised Flight plan on 04/09/2008
Altitude Above Ground (meter)
14000
13000
12000
11000
10000
9000
8000
7000
6000
5000
4000
3000
2000
1000
12
13
14
15
16
17
18
19
20
21
22
TIME (UTC)
3.7
2.9
2.3
1.6
1.2
0.94
0.73
0.56
0.43
0.27
0.19
0.13
−68.33 E
63.45 N
−67.265 E
70.747 N
−65.397 E
77.889 N
−62.25 E
82.4833 N
−100 E
89 N
−151.147 E
83.8 N
−154.694 E
78.938 N
−156.77 E
71.3 N
−170.616 E
71.131 N
−162.7103 E
64.4145 N
−147.869 E
64.81972 N

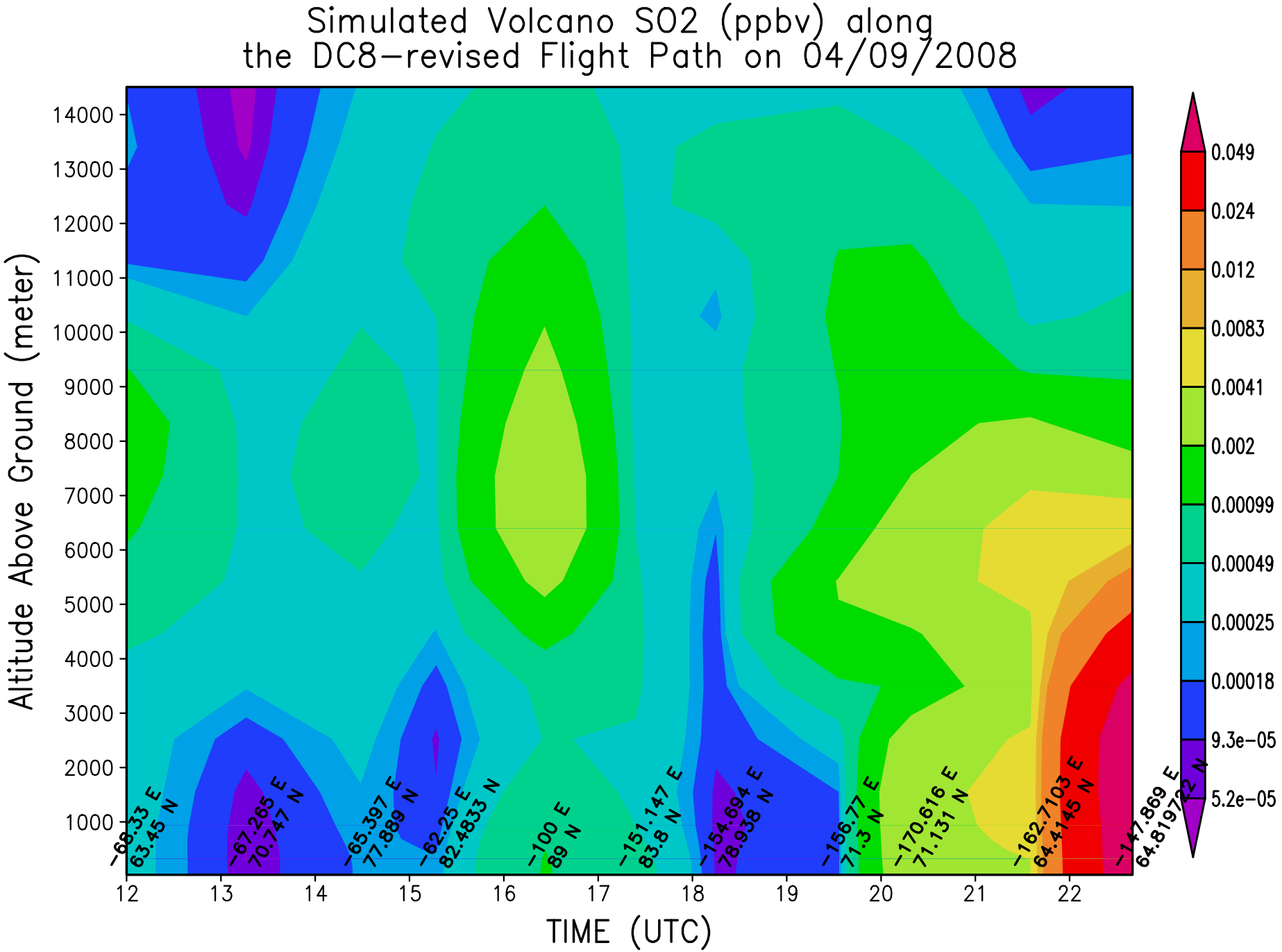

Simulated total CO (ppbv) along the
DC8–revised Flight plan on 04/09/2008
Altitude Above Ground (meter)
14000
13000
12000
11000
10000
9000
8000
7000
6000
5000
4000
3000
2000
1000
12
13
14
15
16
17
18
19
20
21
22
TIME (UTC)
-68.33 E
63.45 N
-67.265 E
70.747 N
-65.397 E
77.889 N
-62.25 E
82.4833 N
-100 E
89 N
-151.147 E
83.8 N
-154.694 E
78.938 N
-156.77 E
71.3 N
-170.616 E
71.131 N
-162.7103 E
64.4145 N
-147.869 E
64.81972 N
14
10
8.3
6.6
4.7
3.7
2.9
2.3
1.6
1.2
0.9
0.57

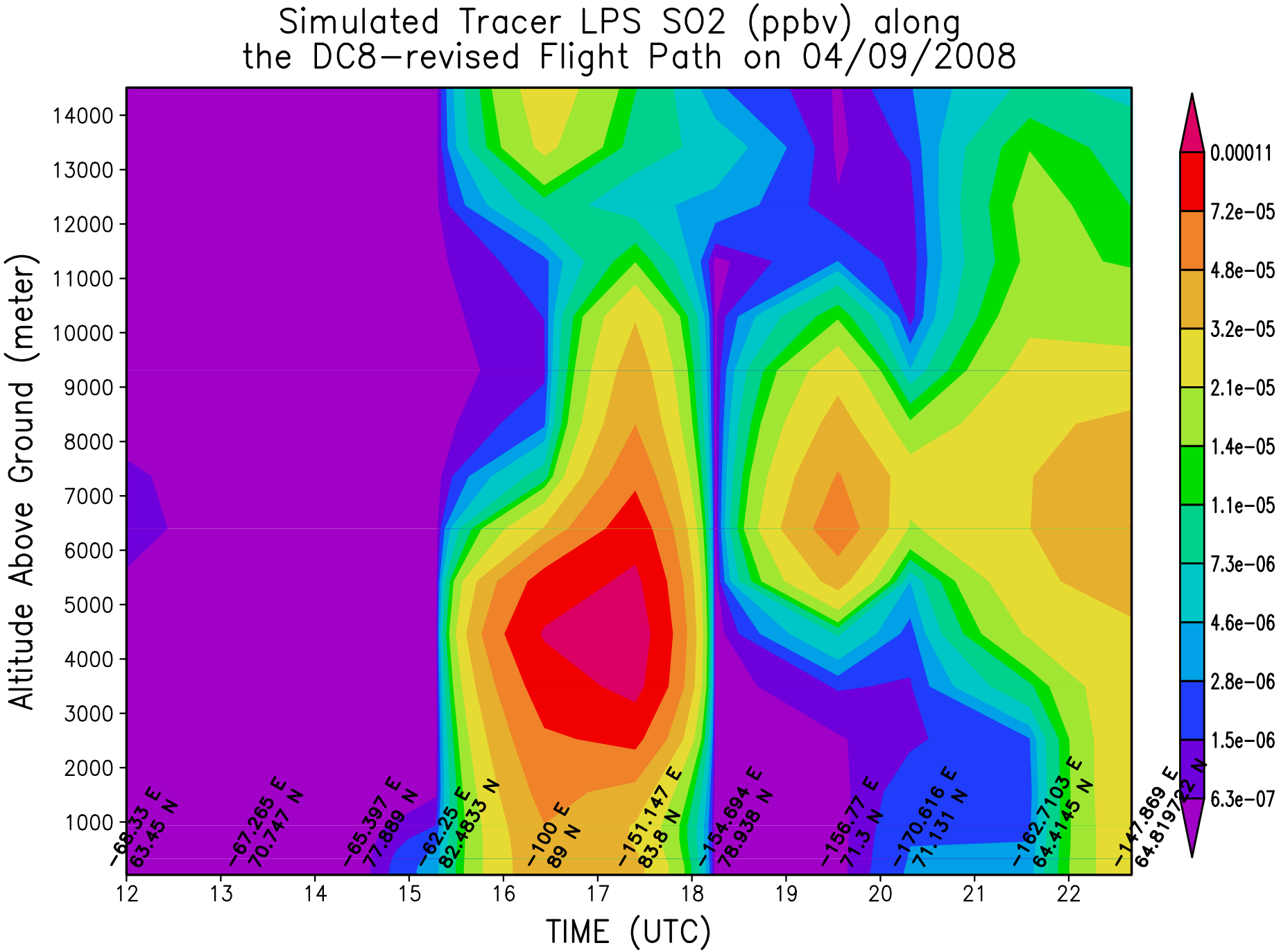

Simulated Organic Carbon (μg/m³) along
the DC8–revised Flight Path on 04/09/2008
Altitude Above Ground (meter)
14000
13000
12000
11000
10000
9000
8000
7000
6000
5000
4000
3000
2000
1000
12
13
14
15
16
17
18
19
20
21
22
TIME (UTC)
-68.33 E
63.45 N
-67.265 E
70.747 N
-65.397 E
77.889 N
-62.25 E
82.4833 N
-100 E
89 N
-151.147 E
83.8 N
-154.694 E
78.938 N
-156.77 E
71.3 N
-170.616 E
71.131 N
-162.7103 E
64.4145 N
-147.869 E
64.81972 N
0.28
0.22
0.16
0.12
0.097
0.076
0.052
0.04
0.031
0.023
0.014
0.0097

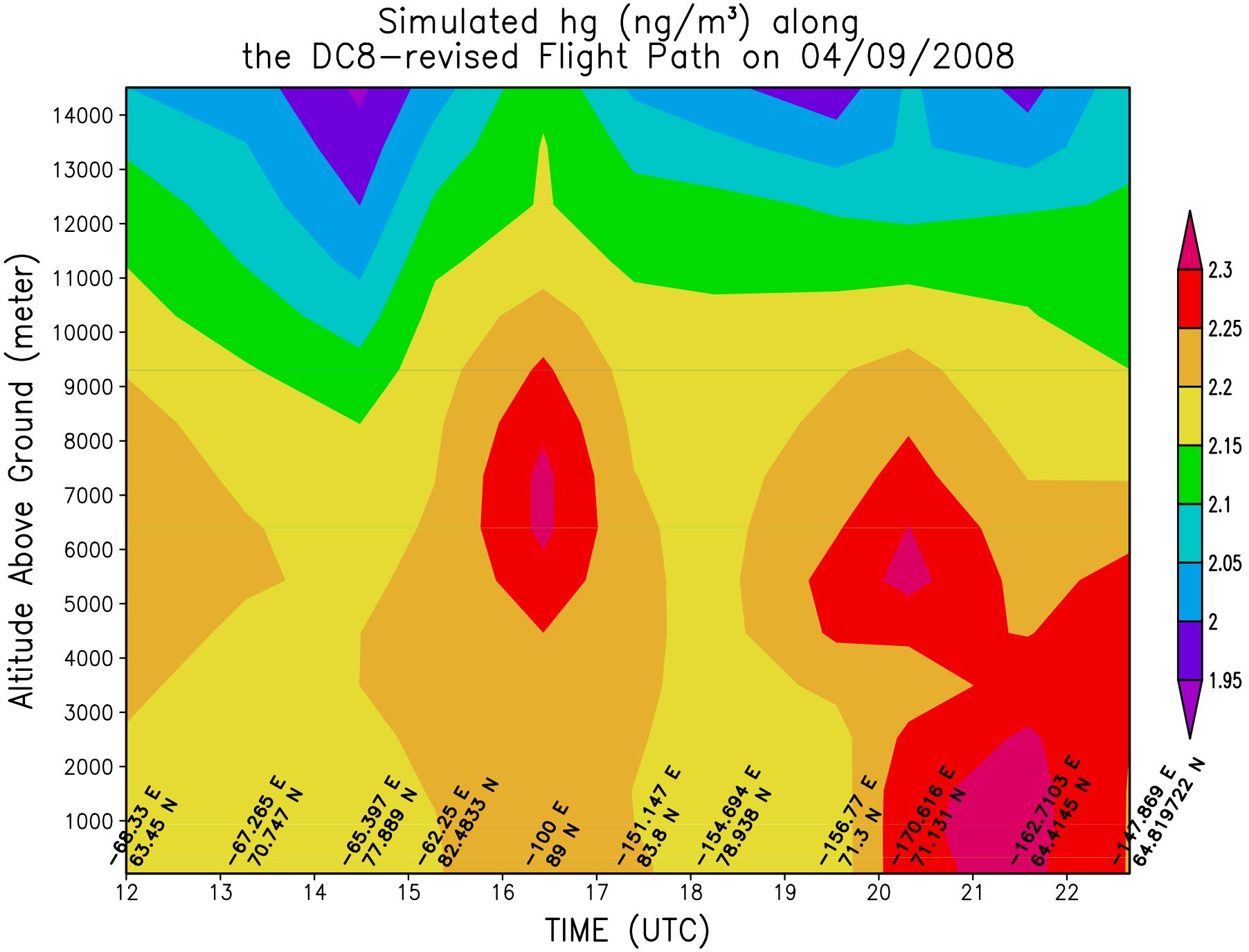

Simulated Black Carbon (μg/m³) along the
DC8–revised Flight Path on 04/09/2008
Altitude Above Ground (meter)
14000
13000
12000
11000
10000
9000
8000
7000
6000
5000
4000
3000
2000
1000
12
13
14
15
16
17
18
19
20
21
22
TIME (UTC)
−68.33 E
63.45 N
−67.265 E
70.747 N
−65.397 E
77.889 N
−62.25 E
82.4833 N
−100 E
89 N
−151.147 E
83.8 N
−154.694 E
78.938 N
−156.77 E
71.3 N
−170.616 E
71.131 N
−162.7103 E
64.4145 N
−147.869 E
64.81972 N
0.1
0.082
0.067
0.05
0.041
0.034
0.028
0.024
0.02
0.016
0.014
0.012

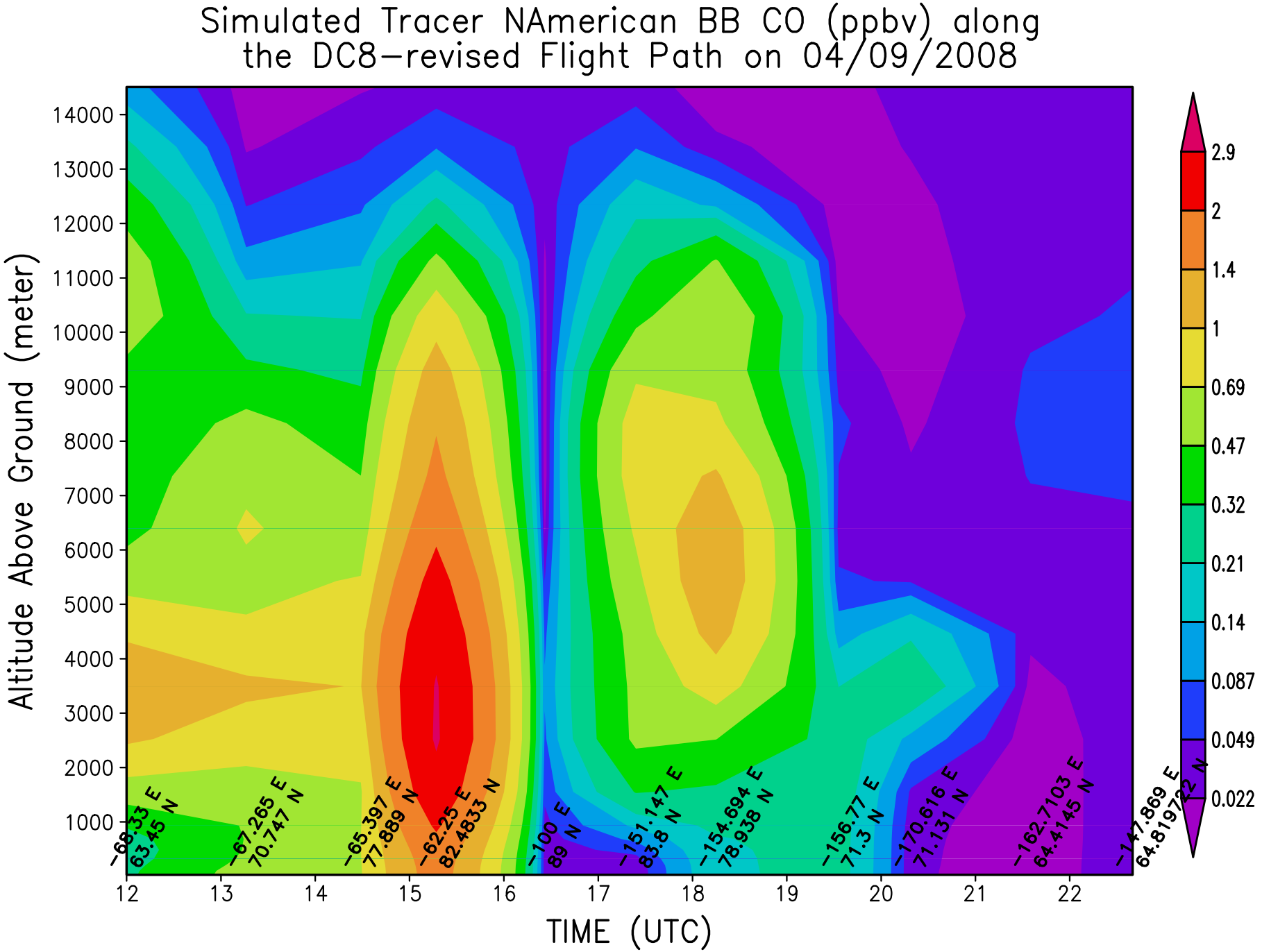

Simulated Dust (μg/m³) along the
DC8–revised Flight Path on 04/09/2008
Altitude Above Ground (meter)
14000
13000
12000
11000
10000
9000
8000
7000
6000
5000
4000
3000
2000
1000
12
13
14
15
16
17
18
19
20
21
22
TIME (UTC)
−68.33 E
63.45 N
−67.265 E
70.747 N
−65.397 E
77.889 N
−62.25 E
82.4833 N
−100 E
89 N
−151.147 E
83.8 N
−154.694 E
78.938 N
−156.77 E
71.3 N
−170.616 E
71.131 N
−162.7103 E
64.4145 N
−147.869 E
64.81972 N
13
10
7.9
6
4.5
3.4
2.1
1.5
1.1
0.78
0.51
0.3

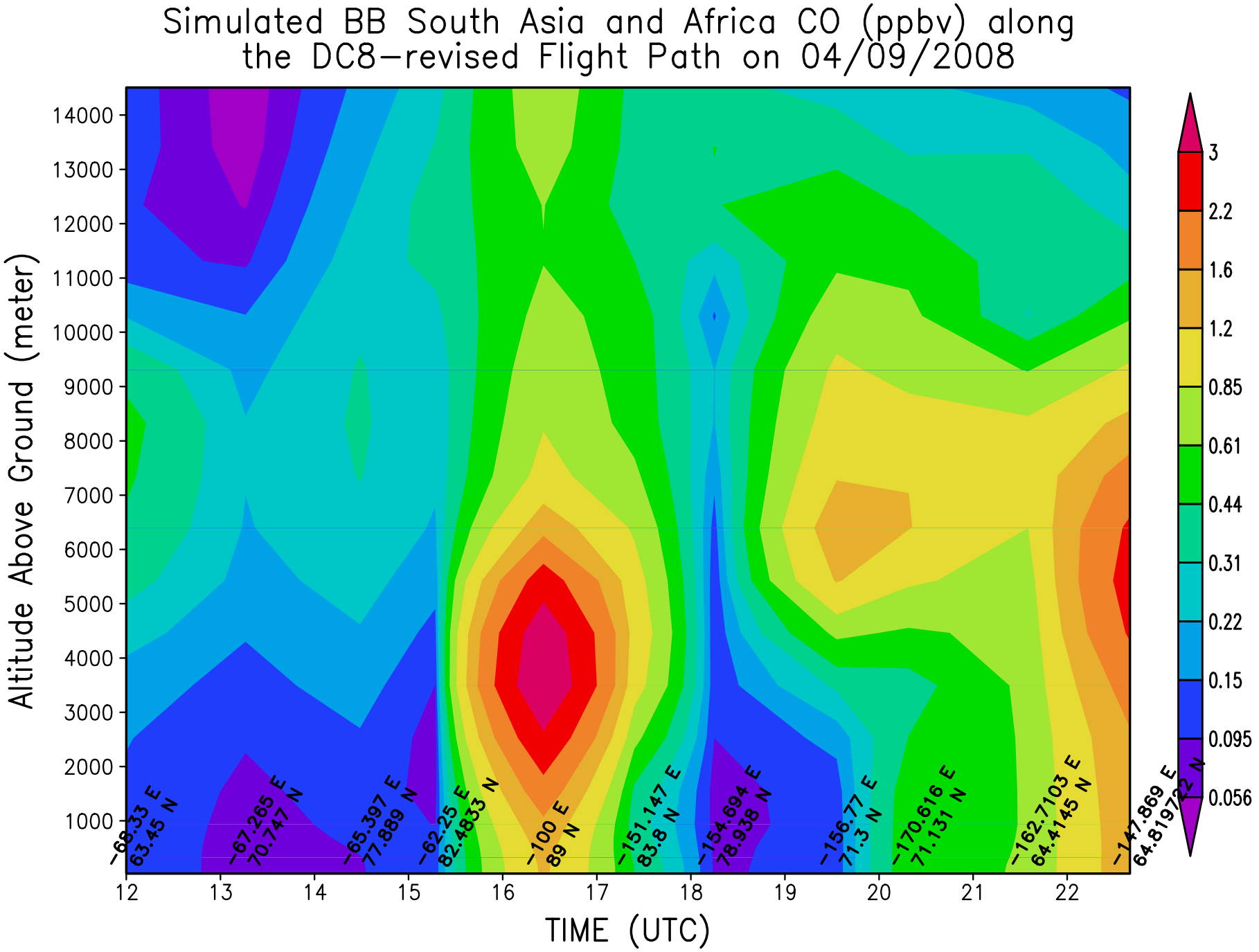

Simulated Total Sulfate (μg/m³) along
the DC8–revised Flight Path on 04/09/2008
Altitude Above Ground (meter)
14000
13000
12000
11000
10000
9000
8000
7000
6000
5000
4000
3000
2000
1000
12
13
14
15
16
17
18
19
20
21
22
TIME (UTC)
1.4
1.1
0.82
0.65
0.5
0.39
0.26
0.2
0.15
0.11
0.067
0.043
−68.33 E
63.45 N
−67.265 E
70.747 N
−65.397 E
77.889 N
−62.25 E
82.4833 N
−100 E
89 N
−151.147 E
83.8 N
−154.694 E
78.938 N
−156.77 E
71.3 N
−170.616 E
71.131 N
−162.7103 E
64.4145 N
−147.869 E
64.81972 N

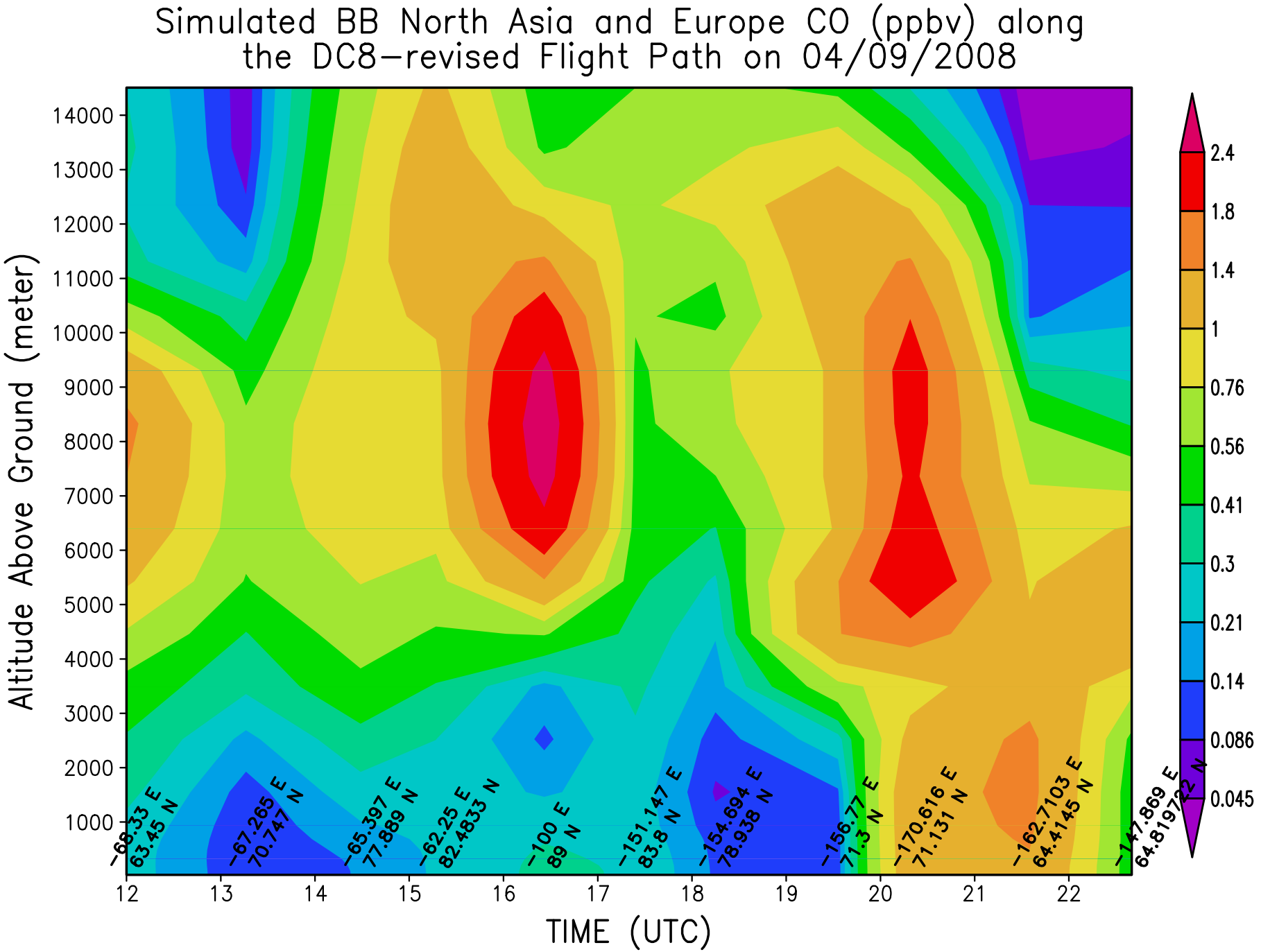

Simulated Volcano SO2 (ppbv) along
the DC8–revised Flight Path on 04/09/2008
Altitude Above Ground (meter)
14000
13000
12000
11000
10000
9000
8000
7000
6000
5000
4000
3000
2000
1000
12
13
14
15
16
17
18
19
20
21
22
TIME (UTC)
-68.33 E
63.45 N
-67.265 E
70.747 N
-65.397 E
77.889 N
-62.25 E
82.4833 N
-100 E
89 N
-151.147 E
83.8 N
-154.694 E
78.938 N
-156.77 E
71.3 N
-170.616 E
71.131 N
-162.7103 E
64.4145 N
-147.869 E
64.81972 N
0.049
0.024
0.012
0.0083
0.0041
0.002
0.00099
0.00049
0.00025
0.00018
9.3e-05
5.2e-05

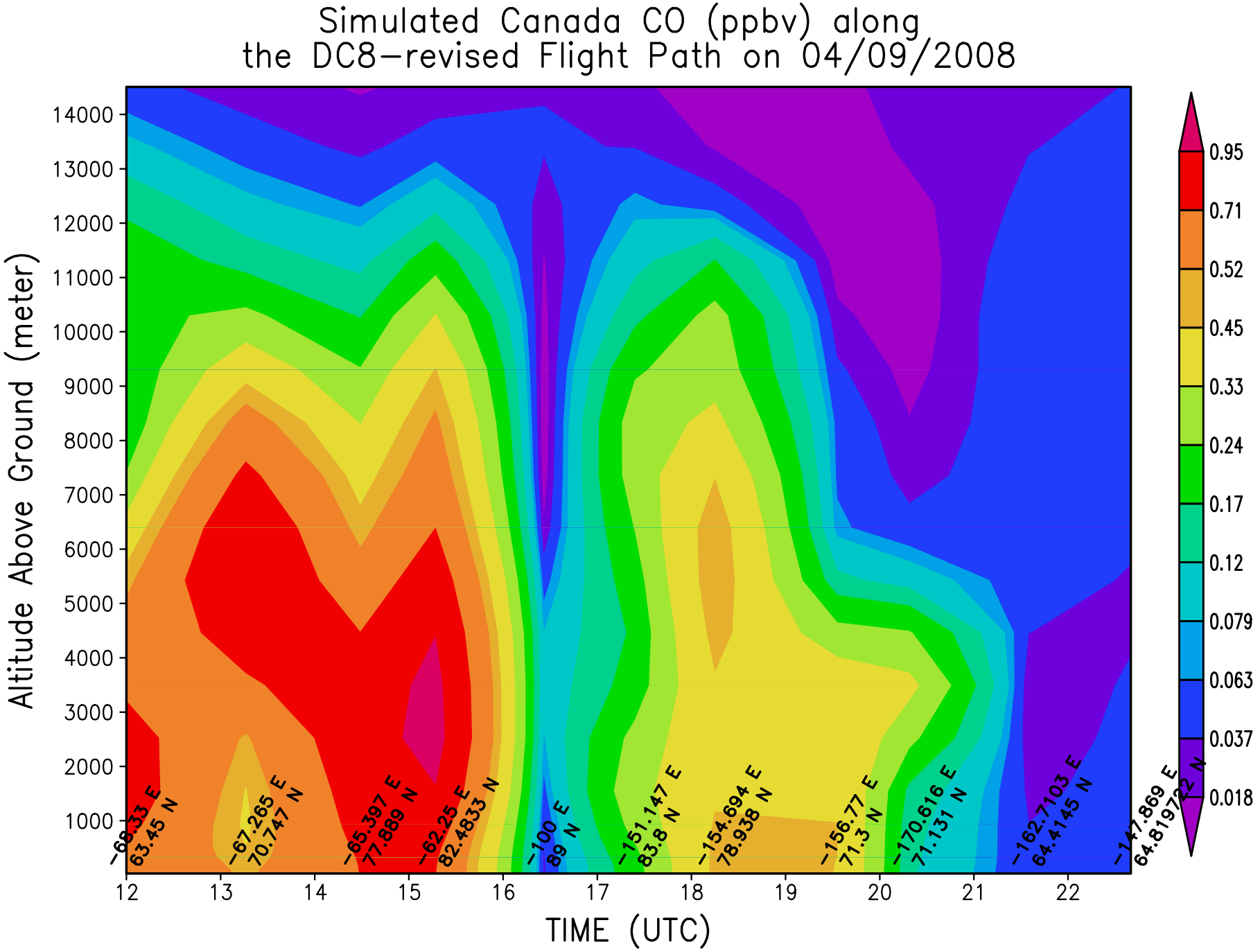

Simulated Tracer LPS SO2 (ppbv) along
the DC8–revised Flight Path on 04/09/2008
Altitude Above Ground (meter)
14000
13000
12000
11000
10000
9000
8000
7000
6000
5000
4000
3000
2000
1000
12
13
14
15
16
17
18
19
20
21
22
TIME (UTC)
-68.33 E
63.45 N
-67.265 E
70.747 N
-65.397 E
77.889 N
-62.25 E
82.4833 N
-100 E
89 N
-151.147 E
83.8 N
-154.694 E
78.938 N
-156.77 E
71.3 N
-170.616 E
71.131 N
-162.7103 E
64.4145 N
-147.869 E
64.81972 N
0.00011
7.2e-05
4.8e-05
3.2e-05
2.1e-05
1.4e-05
1.1e-05
7.3e-06
4.6e-06
2.8e-06
1.5e-06
6.3e-07

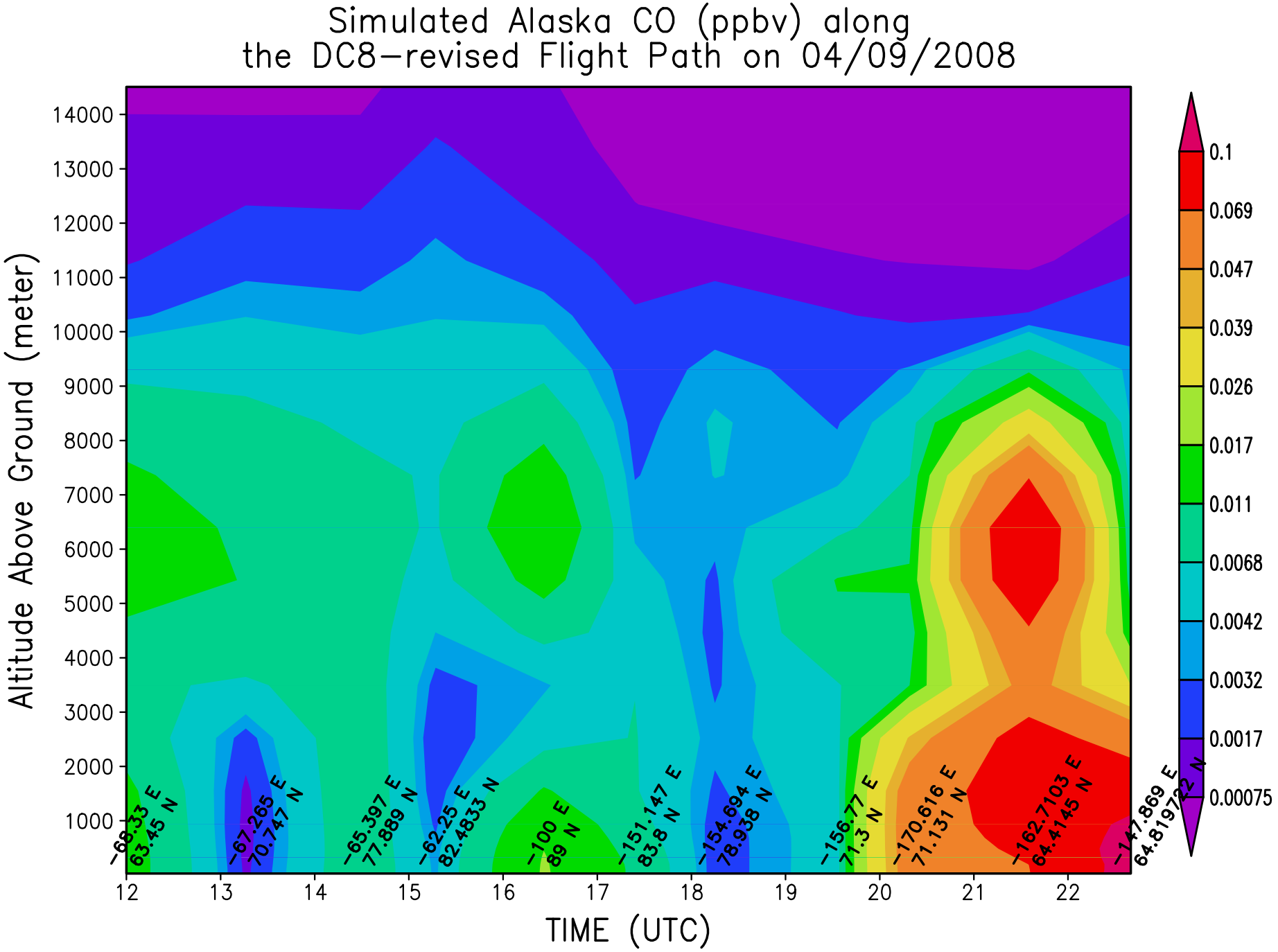

Simulated hg (ng/m³) along
the DC8–revised Flight Path on 04/09/2008
Altitude Above Ground (meter)
14000
13000
12000
11000
10000
9000
8000
7000
6000
5000
4000
3000
2000
1000
12
13
14
15
16
17
18
19
20
21
22
TIME (UTC)
2.3
2.25
2.2
2.15
2.1
2.05
2
1.95
-66.33 E
63.45 N
-67.265 E
70.747 N
-65.397 E
77.889 N
-62.25 E
82.4833 N
-100 E
89 N
-151.147 E
83.8 N
-154.694 E
78.938 N
-156.77 E
71.3 N
-170.616 E
71.131 N
-162.7103 E
64.4145 N
-147.869 E
64.819722 N

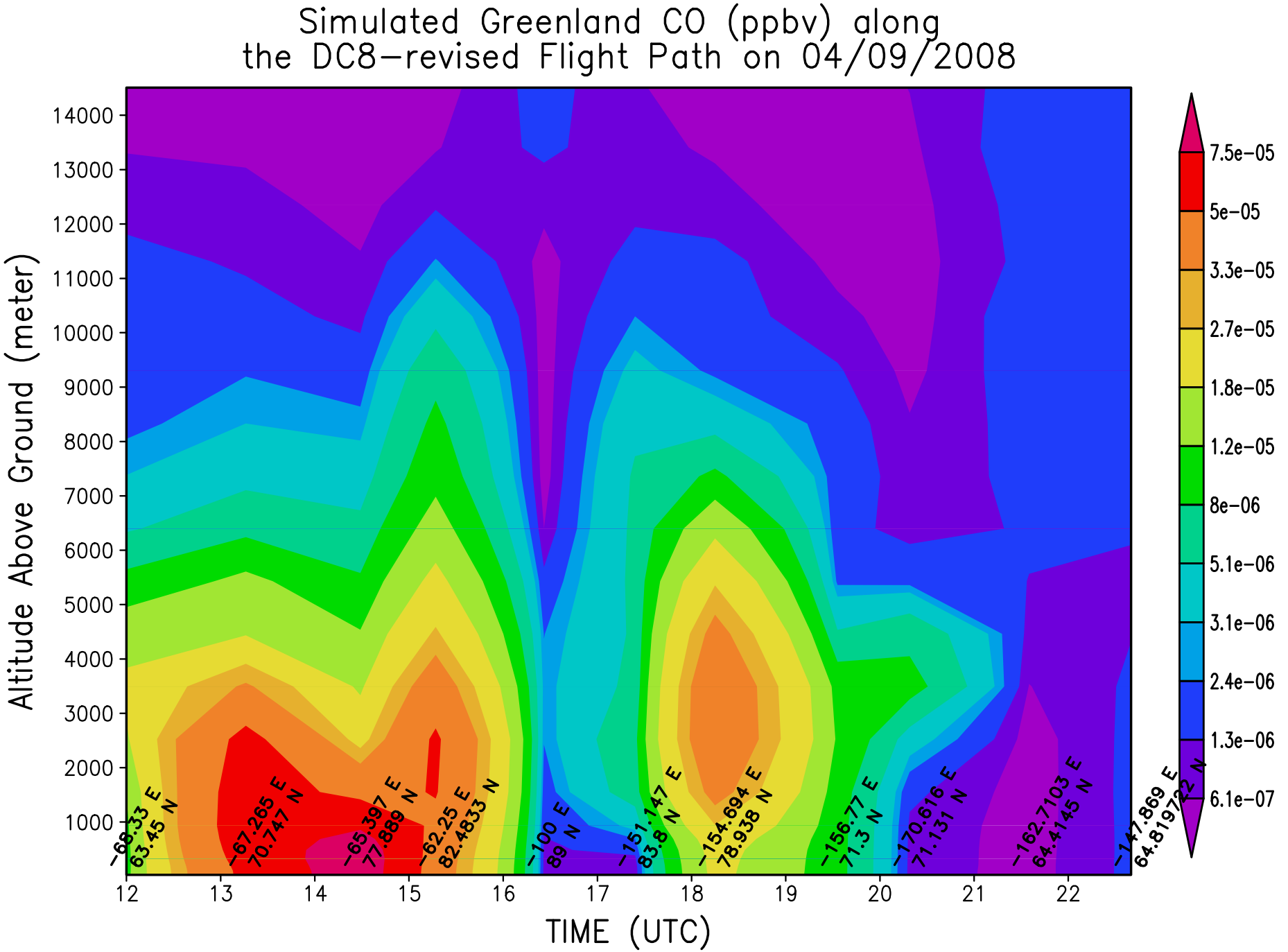

Simulated Tracer NAmerican BB CO (ppbv) along
the DC8–revised Flight Path on 04/09/2008
Altitude Above Ground (meter)
14000
13000
12000
11000
10000
9000
8000
7000
6000
5000
4000
3000
2000
1000
12
13
14
15
16
17
18
19
20
21
22
TIME (UTC)
2.9
2
1.4
1
0.69
0.47
0.32
0.21
0.14
0.087
0.049
0.022
−68.33 E
63.45 N
−67.265 E
70.747 N
−65.397 E
77.889 N
−62.25 E
82.4833 N
−100 E
89 N
−151.147 E
83.8 N
−154.694 E
78.938 N
−156.77 E
71.3 N
−170.616 E
71.131 N
−162.7103 E
64.4145 N
−147.869 E
64.81972 N

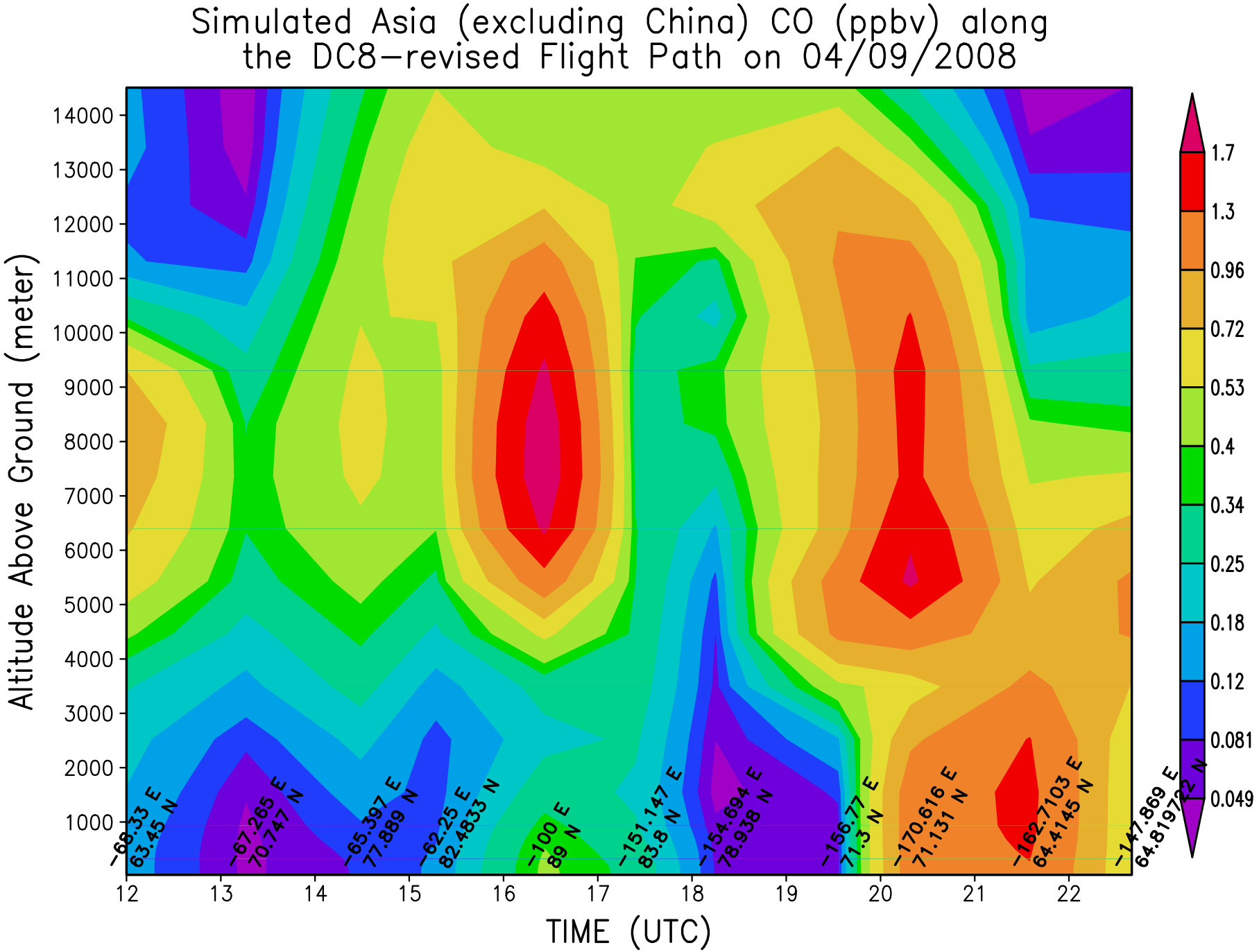

Simulated BB South Asia and Africa CO (ppbv) along
the DC8–revised Flight Path on 04/09/2008
Altitude Above Ground (meter)
14000
13000
12000
11000
10000
9000
8000
7000
6000
5000
4000
3000
2000
1000
12
13
14
15
16
17
18
19
20
21
22
TIME (UTC)
3
2.2
1.6
1.2
0.85
0.61
0.44
0.31
0.22
0.15
0.095
0.056
−68.33 E
63.45 N
−67.265 E
70.747 N
−65.397 E
77.889 N
−62.25 E
82.4833 N
−100 E
89 N
−151.147 E
83.8 N
−154.694 E
78.938 N
−156.77 E
71.3 N
−170.616 E
71.131 N
−162.7103 E
64.4145 N
−147.869 E
64.81972 N

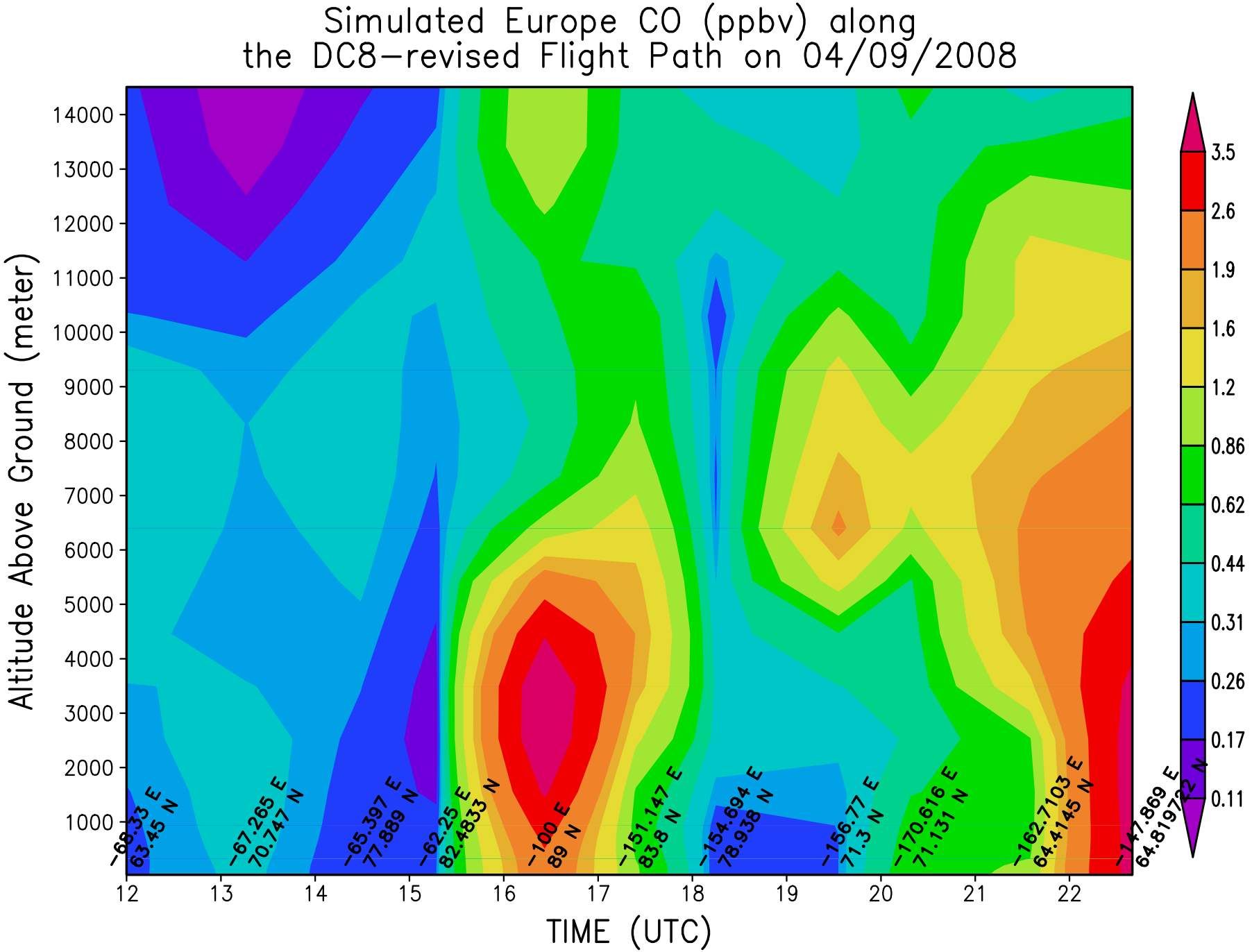

Simulated BB North Asia and Europe CO (ppbv) along
the DC8–revised Flight Path on 04/09/2008
Altitude Above Ground (meter)
14000
13000
12000
11000
10000
9000
8000
7000
6000
5000
4000
3000
2000
1000
12
13
14
15
16
17
18
19
20
21
22
TIME (UTC)
2.4
1.8
1.4
1
0.76
0.56
0.41
0.3
0.21
0.14
0.086
0.045
−66.33 E
63.45 N
−67.265 E
70.747 N
−65.397 E
77.889 N
−62.25 E
82.4833 N
−100 E
89 N
−151.147 E
83.8 N
−154.694 E
78.938 N
−156.77 E
71.3 N
−170.616 E
71.131 N
−162.7103 E
64.4145 N
−147.869 E
64.81972 N

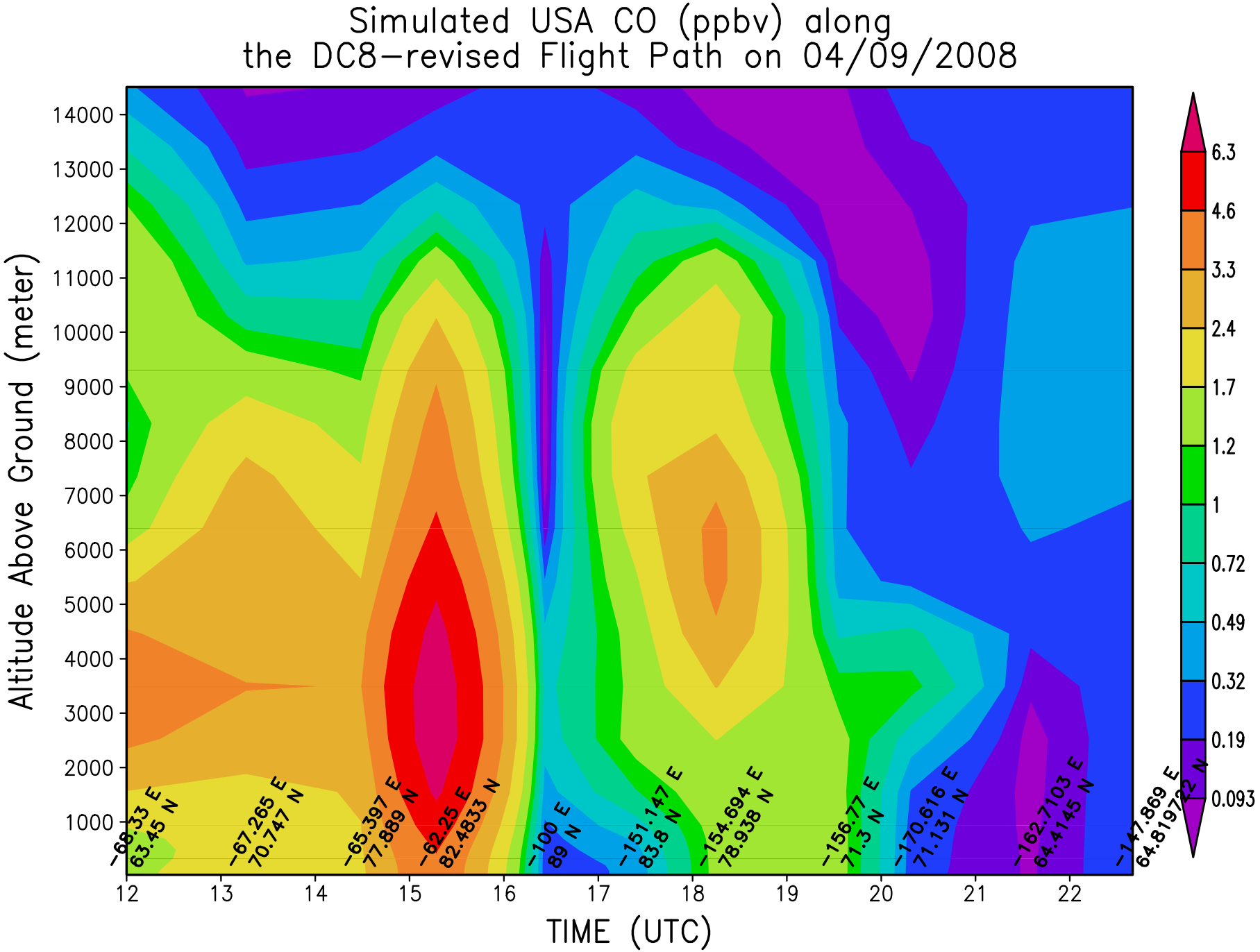

Simulated Canada CO (ppbv) along
the DC8–revised Flight Path on 04/09/2008
Altitude Above Ground (meter)
14000
13000
12000
11000
10000
9000
8000
7000
6000
5000
4000
3000
2000
1000
12
13
14
15
16
17
18
19
20
21
22
TIME (UTC)
0.95
0.71
0.52
0.45
0.33
0.24
0.17
0.12
0.079
0.063
0.037
0.018
−68.33 E
63.45 N
−67.265 E
70.747 N
−65.397 E
77.889 N
−62.25 E
82.4833 N
−100 E
89 N
−151.147 E
83.8 N
−154.694 E
78.938 N
−156.77 E
71.3 N
−170.616 E
71.131 N
−162.7103 E
64.4145 N
−147.869 E
64.81972 N

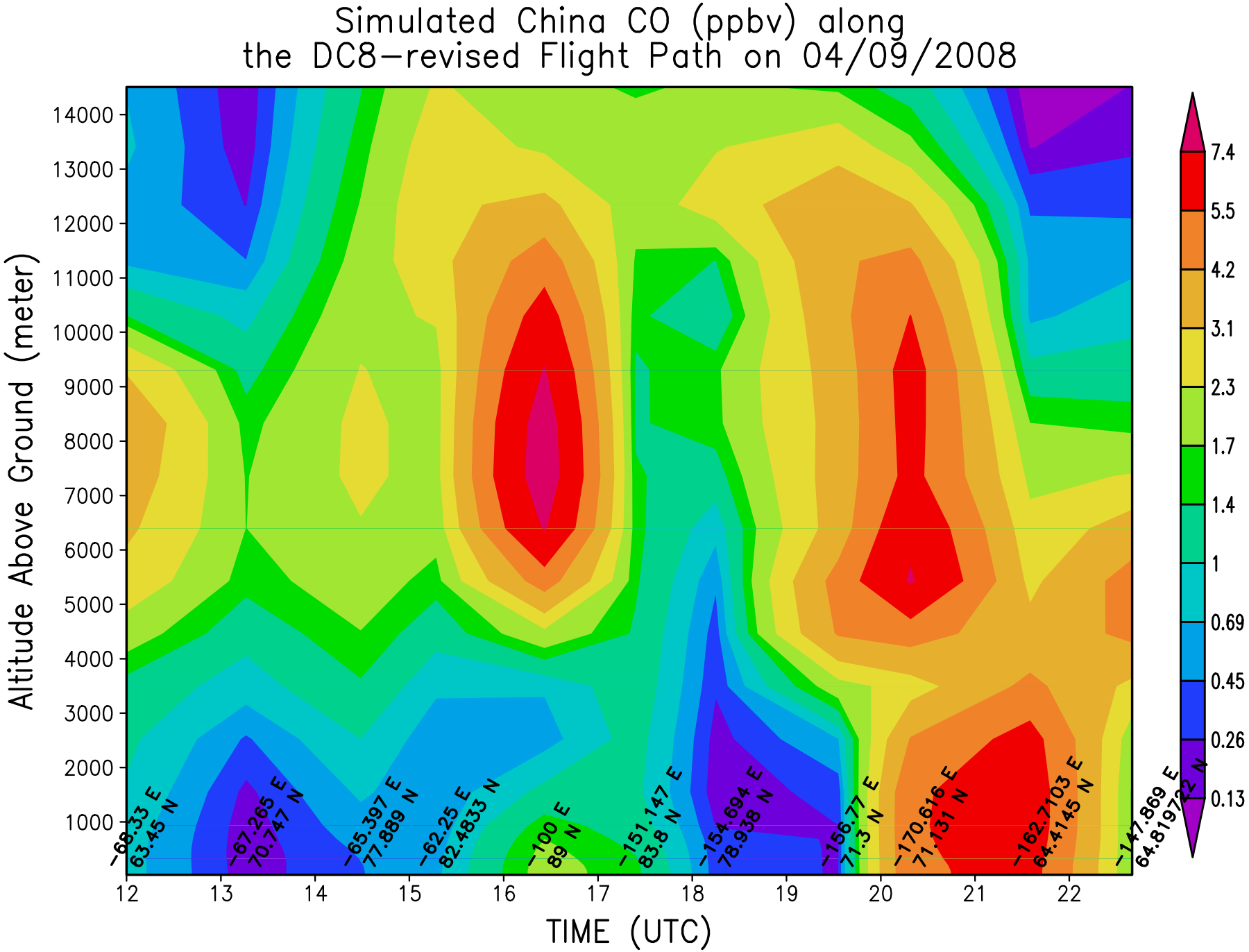

Simulated Alaska CO (ppbv) along
the DC8–revised Flight Path on 04/09/2008
Altitude Above Ground (meter)
14000
13000
12000
11000
10000
9000
8000
7000
6000
5000
4000
3000
2000
1000
12
13
14
15
16
17
18
19
20
21
22
TIME (UTC)
0.1
0.069
0.047
0.039
0.026
0.017
0.011
0.0068
0.0042
0.0032
0.0017
0.00075
−68.33 E
63.45 N
−67.265 E
70.747 N
−65.397 E
77.889 N
−62.25 E
82.4833 N
−100 E
89 N
−151.147 E
83.8 N
−154.694 E
78.938 N
−156.77 E
71.3 N
−170.616 E
71.131 N
−162.7103 E
64.4145 N
−147.869 E
64.81972 N

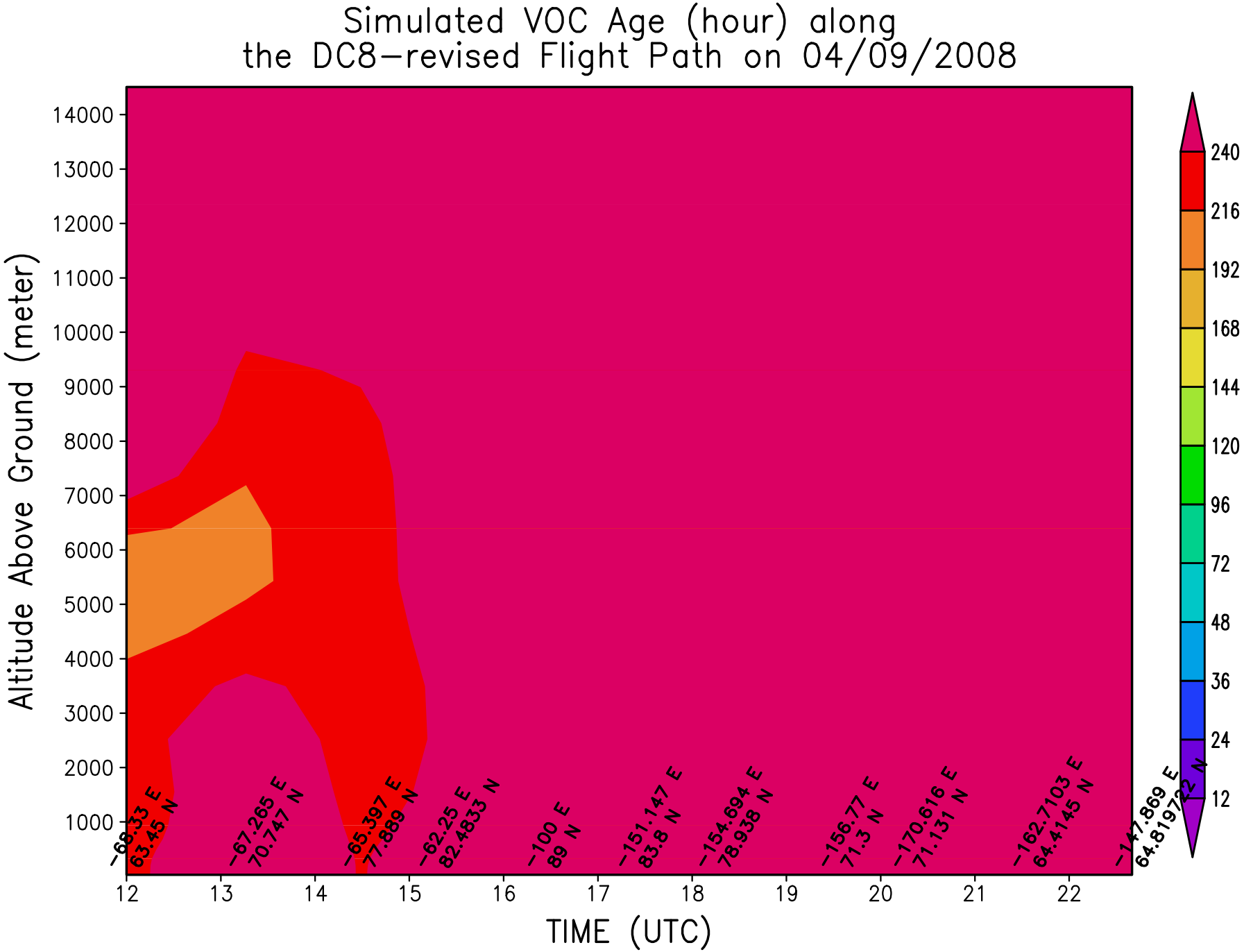

Simulated Greenland CO (ppbv) along
the DC8–revised Flight Path on 04/09/2008
Altitude Above Ground (meter)
14000
13000
12000
11000
10000
9000
8000
7000
6000
5000
4000
3000
2000
1000
12
13
14
15
16
17
18
19
20
21
22
TIME (UTC)
7.5e-05
5e-05
3.3e-05
2.7e-05
1.8e-05
1.2e-05
8e-06
5.1e-06
3.1e-06
2.4e-06
1.3e-06
6.1e-07
-66.33 E
63.45 N
-67.265 E
70.747 N
-65.397 E
77.889 N
-62.25 E
82.4833 N
-100 E
89 N
-151.147 E
83.8 N
-154.694 E
78.938 N
-156.77 E
71.3 N
-170.616 E
71.131 N
-162.7103 E
64.4145 N
-147.869 E
64.81972 N

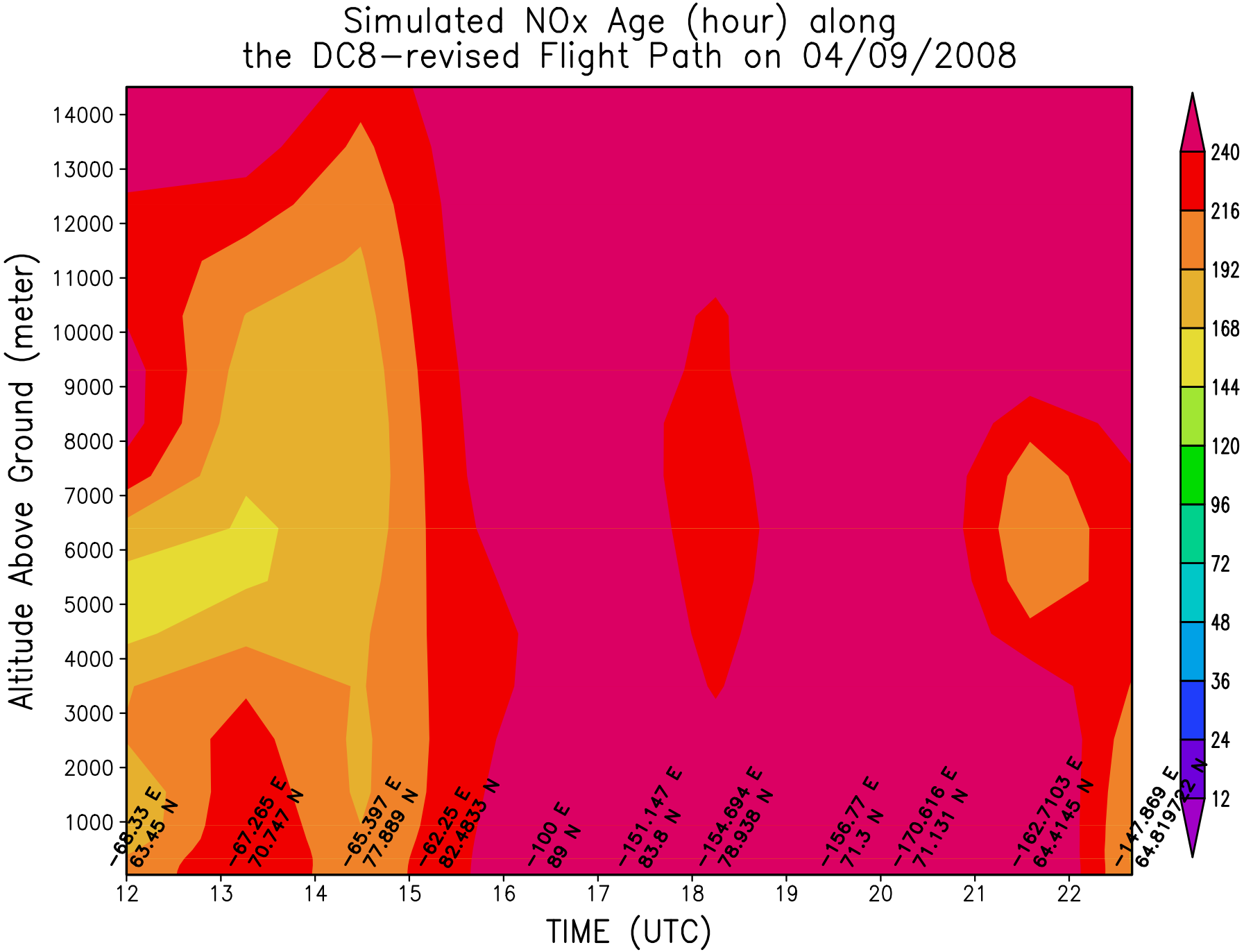

Simulated Asia (excluding China) CO (ppbv) along
the DC8–revised Flight Path on 04/09/2008
Altitude Above Ground (meter)
14000
13000
12000
11000
10000
9000
8000
7000
6000
5000
4000
3000
2000
1000
12
13
14
15
16
17
18
19
20
21
22
TIME (UTC)
1.7
1.3
0.96
0.72
0.53
0.4
0.34
0.25
0.18
0.12
0.081
0.049
-66.33 E
63.45 N
-67.265 E
70.747 N
-65.397 E
77.889 N
-62.25 E
82.4833 N
-100 E
89 N
-151.147 E
83.8 N
-154.694 E
78.938 N
-156.77 E
71.3 N
-170.616 E
71.131 N
-162.7103 E
64.4145 N
-147.869 E
64.81972 N

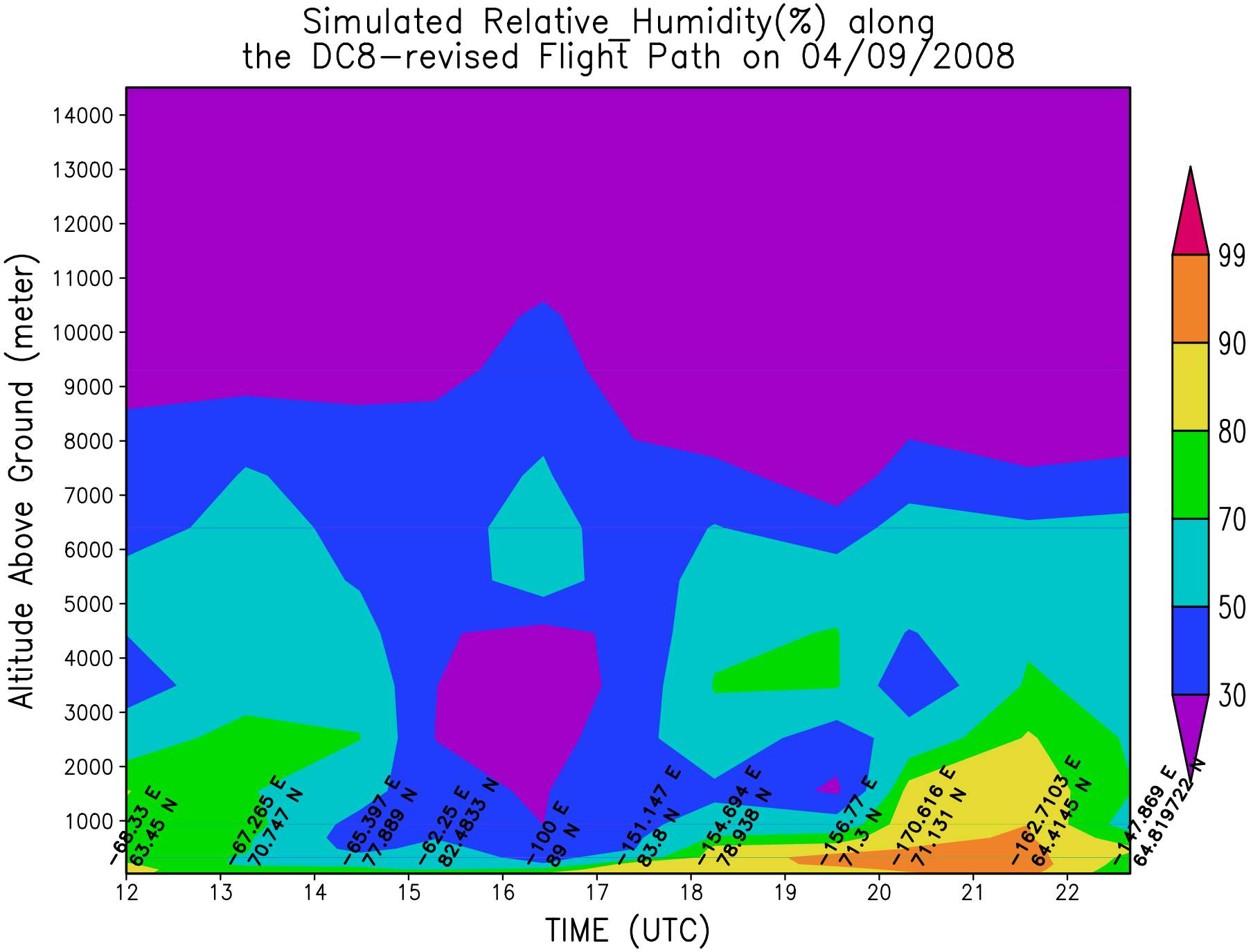

Simulated Europe CO (ppbv) along
the DC8–revised Flight Path on 04/09/2008
Altitude Above Ground (meter)
14000
13000
12000
11000
10000
9000
8000
7000
6000
5000
4000
3000
2000
1000
12
13
14
15
16
17
18
19
20
21
22
TIME (UTC)
−68.33 E
63.45 N
−67.265 E
70.747 N
−65.397 E
77.889 N
−62.25 E
82.4833 N
−100 E
89 N
−151.147 E
83.8 N
−154.694 E
78.938 N
−156.77 E
71.3 N
−170.616 E
71.131 N
−162.7103 E
64.4145 N
−147.869 E
64.81972 N
3.5
2.6
1.9
1.6
1.2
0.86
0.62
0.44
0.31
0.26
0.17
0.11


Simulated USA CO (ppbv) along
the DC8–revised Flight Path on 04/09/2008
Altitude Above Ground (meter)
14000
13000
12000
11000
10000
9000
8000
7000
6000
5000
4000
3000
2000
1000
12
13
14
15
16
17
18
19
20
21
22
TIME (UTC)
6.3
4.6
3.3
2.4
1.7
1.2
1
0.72
0.49
0.32
0.19
0.093
−68.33 E
63.45 N
−67.265 E
70.747 N
−65.397 E
77.889 N
−62.25 E
82.4833 N
−100 E
89 N
−151.147 E
83.8 N
−154.694 E
78.938 N
−156.77 E
71.3 N
−170.616 E
71.131 N
−162.7103 E
64.4145 N
−147.869 E
64.81972 N


Simulated China CO (ppbv) along
the DC8–revised Flight Path on 04/09/2008
Altitude Above Ground (meter)
14000
13000
12000
11000
10000
9000
8000
7000
6000
5000
4000
3000
2000
1000
12
13
14
15
16
17
18
19
20
21
22
TIME (UTC)
7.4
5.5
4.2
3.1
2.3
1.7
1.4
1
0.69
0.45
0.26
0.13
−68.33 E
63.45 N
−67.265 E
70.747 N
−65.397 E
77.889 N
−62.25 E
82.4833 N
−100 E
89 N
−151.147 E
83.8 N
−154.694 E
78.938 N
−156.77 E
71.3 N
−170.616 E
71.131 N
−162.7103 E
64.4145 N
−147.869 E
64.81972 N


Simulated VOC Age (hour) along
the DC8–revised Flight Path on 04/09/2008
Altitude Above Ground (meter)
14000
13000
12000
11000
10000
9000
8000
7000
6000
5000
4000
3000
2000
1000
12
13
14
15
16
17
18
19
20
21
22
TIME (UTC)
240
216
192
168
144
120
96
72
48
36
24
12
−68.33 E
63.45 N
−67.265 E
70.747 N
−65.397 E
77.889 N
−62.25 E
82.4833 N
−100 E
89 N
−151.147 E
83.8 N
−154.694 E
78.938 N
−156.77 E
71.3 N
−170.616 E
71.131 N
−162.7103 E
64.4145 N
−147.869 E
64.81972 N


Simulated NOx Age (hour) along
the DC8–revised Flight Path on 04/09/2008
Altitude Above Ground (meter)
14000
13000
12000
11000
10000
9000
8000
7000
6000
5000
4000
3000
2000
1000
12
13
14
15
16
17
18
19
20
21
22
TIME (UTC)
-66.33 E
63.45 N
-67.265 E
70.747 N
-65.397 E
77.889 N
-62.25 E
82.4833 N
-100 E
89 N
-151.147 E
83.8 N
-154.694 E
78.938 N
-156.77 E
71.3 N
-170.616 E
71.131 N
-162.7103 E
64.4145 N
-147.869 E
64.81972 N
240
216
192
168
144
120
96
72
48
36
24
12


Simulated Relative_Humidity(%) along
the DC8-revised Flight Path on 04/09/2008
Altitude Above Ground (meter)
14000
13000
12000
11000
10000
9000
8000
7000
6000
5000
4000
3000
2000
1000
12
13
14
15
16
17
18
19
20
21
22
TIME (UTC)
99
90
80
70
50
30
-66.33 E
63.45 N
-67.265 E
70.747 N
-65.397 E
77.889 N
-62.25 E
82.4833 N
-100 E
89 N
-151.147 E
83.8 N
-154.694 E
78.938 N
-156.77 E
71.3 N
-170.616 E
71.131 N
-162.7103 E
64.4145 N
-147.869 E
64.819722 N