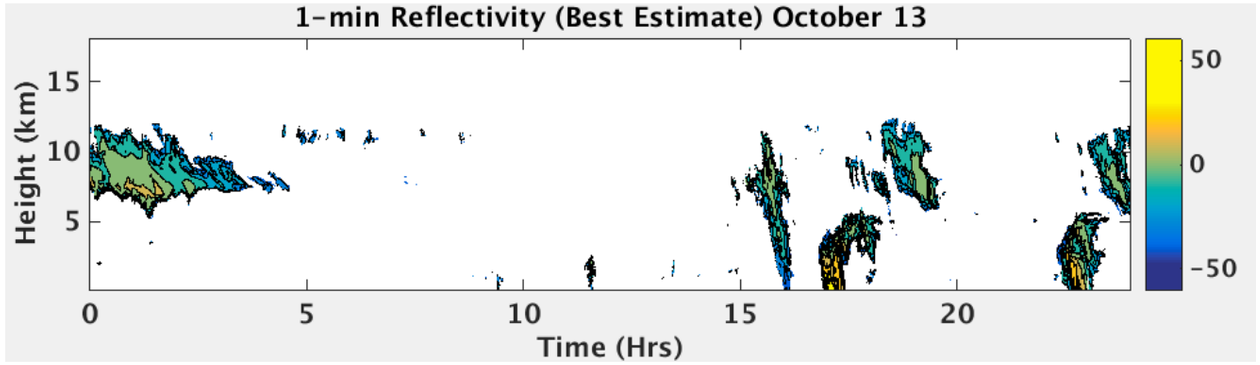
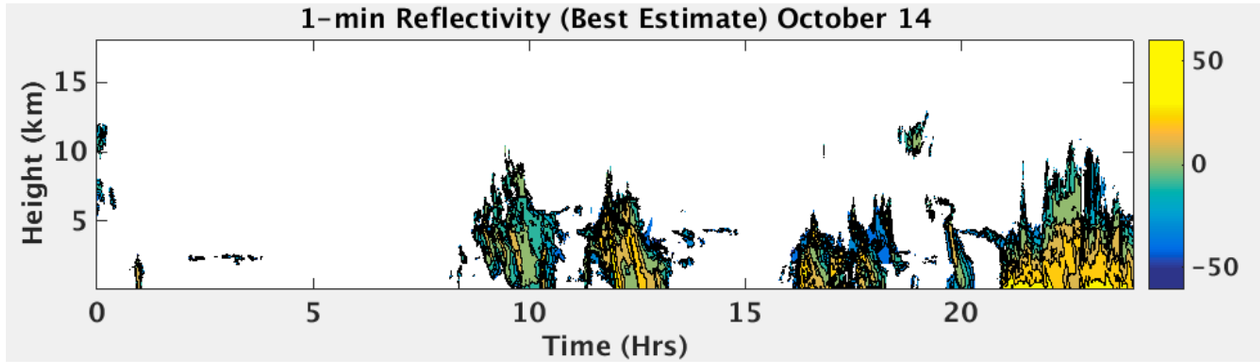
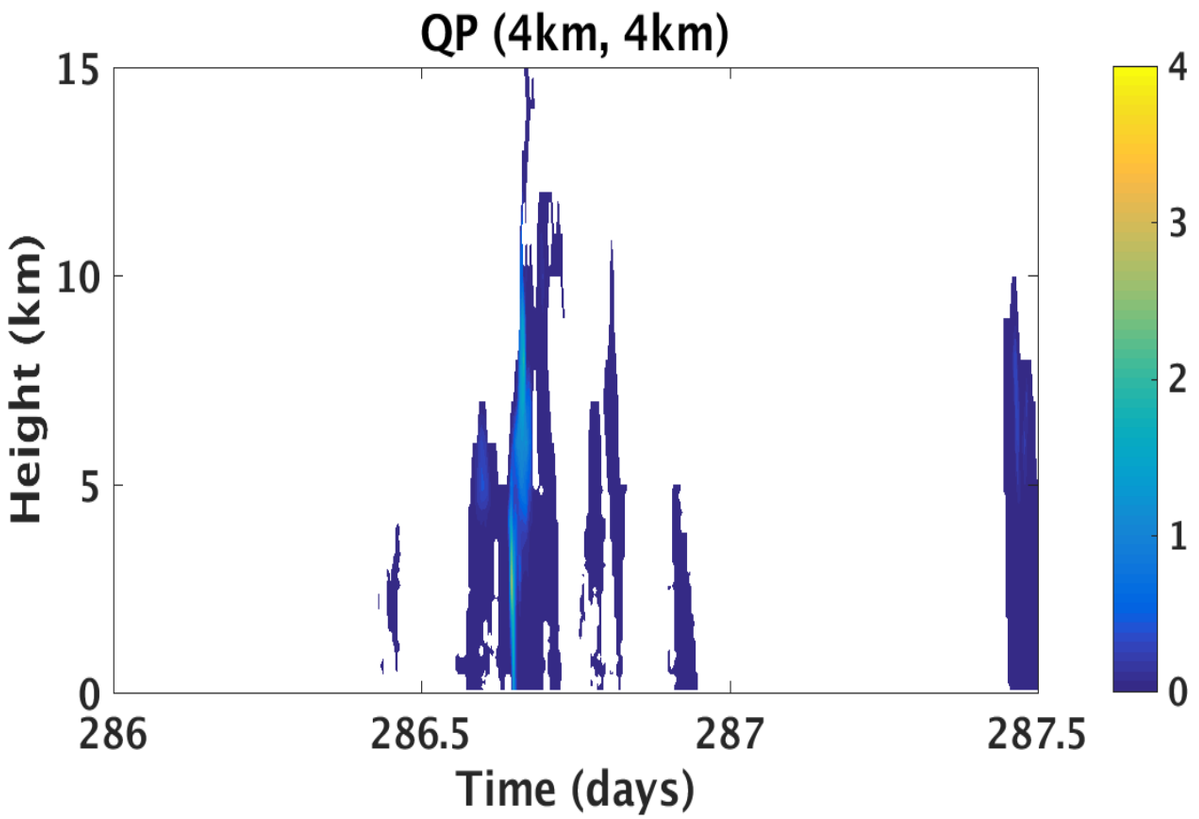
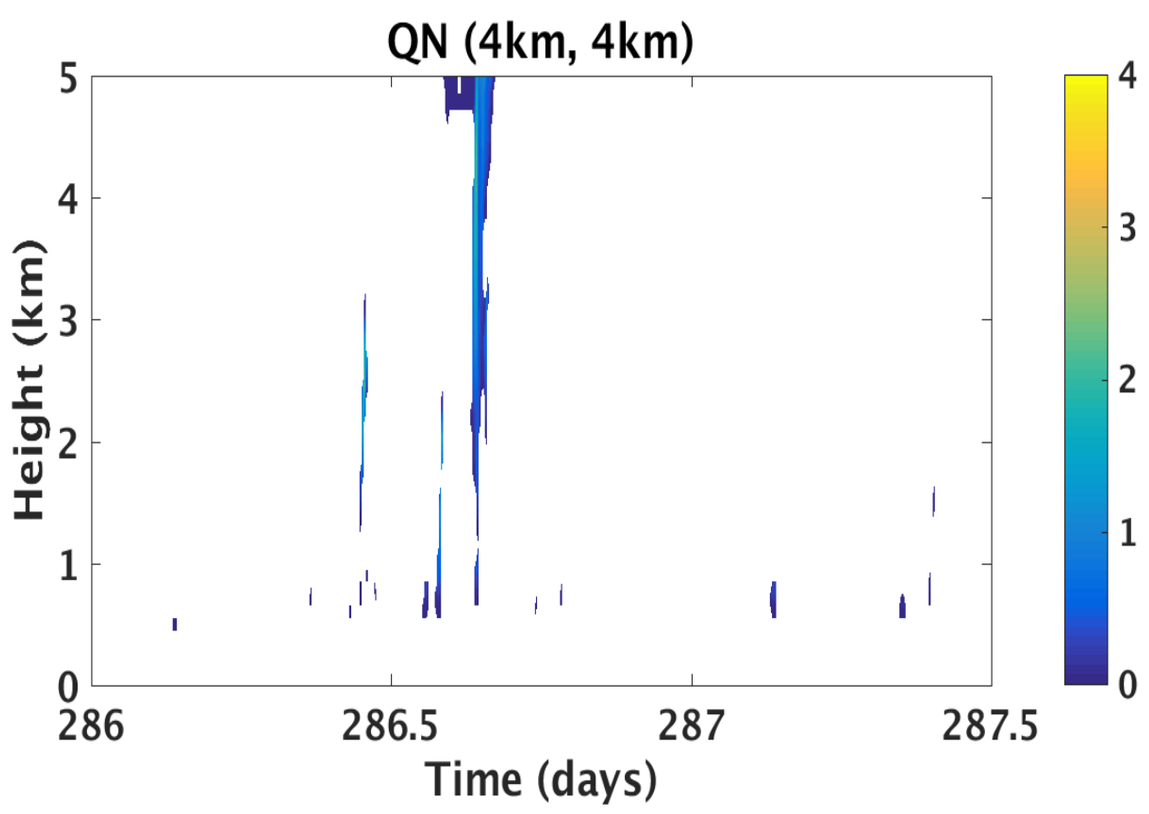
Want to compare model to ARSCL reflectivity estimate.





Looked at QP and QN, clearly needed a dBZ estimate.





Building dBZ estimate:

$$Z_e = a*W*r_e^3$$

Z_e = reflectivity of cloud water or cloud ice

a = coefficient (varies by phase)

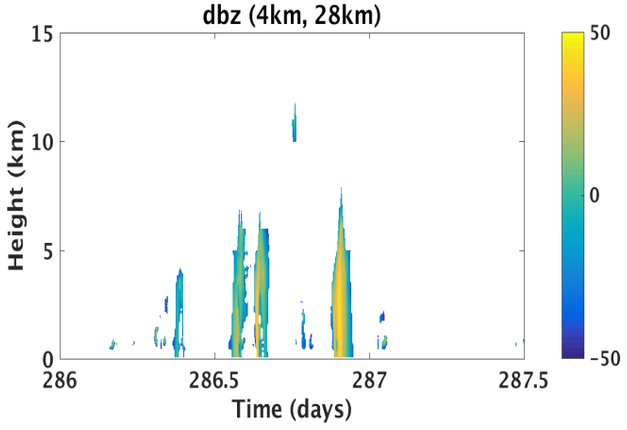
W = liquid or ice water content (g/m^3)

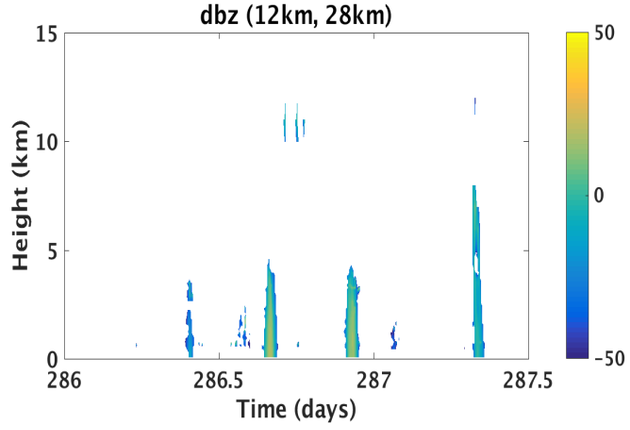
r_e = effective radius of cloud particles (μm)

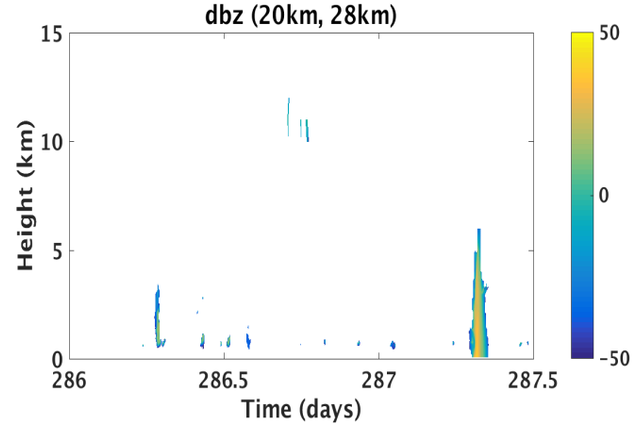
$$Z_e = 2.0 \times 10^4 (\rho q_r)^{1.75}$$

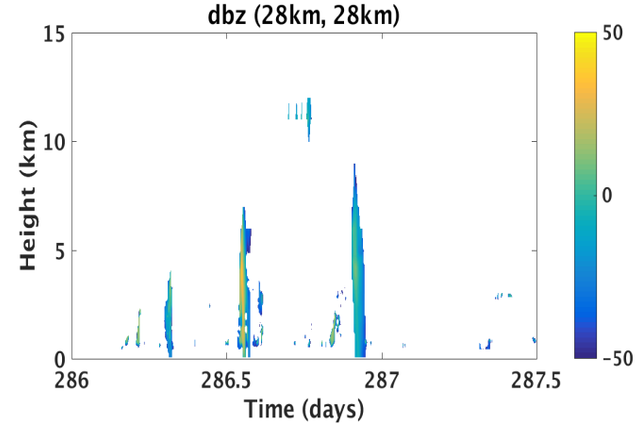
$$+ \frac{0.197}{0.93} [6.0 \times 10^3 (\rho q_s)^{1.72} + 4.9 \times 10^3 (\rho q_g)^{1.72}]$$

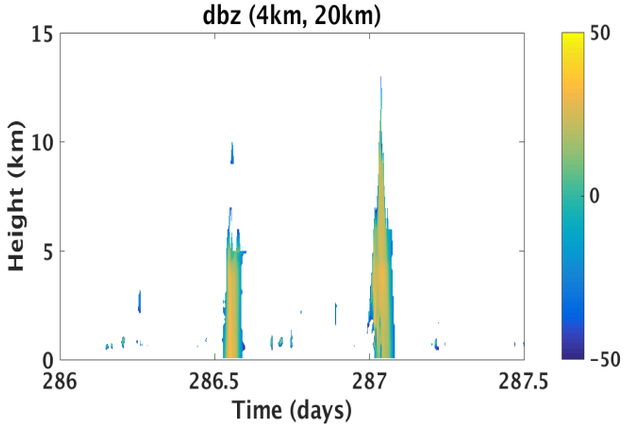
Reflectivity of rain, snow, and graupel.

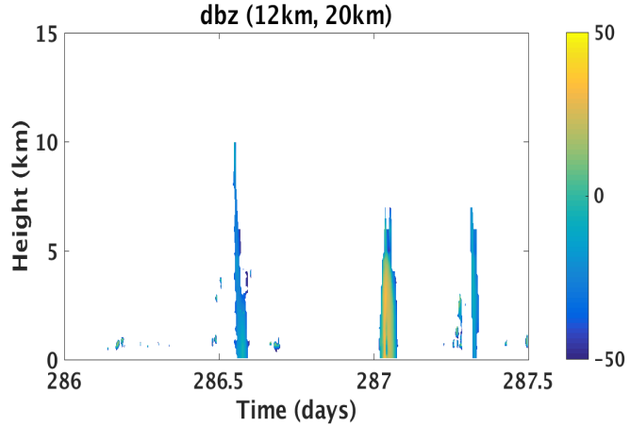

dbz (4km, 28km)
Height (km)
Time (days)

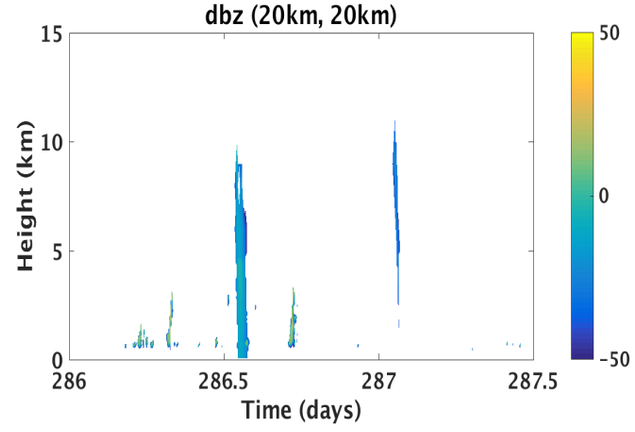

dbz (12km, 28km)
Height (km)
Time (days)

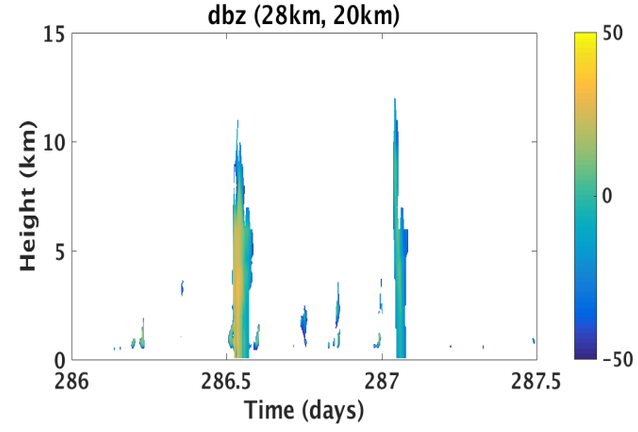

dbz (20km, 28km)
Height (km)
Time (days)

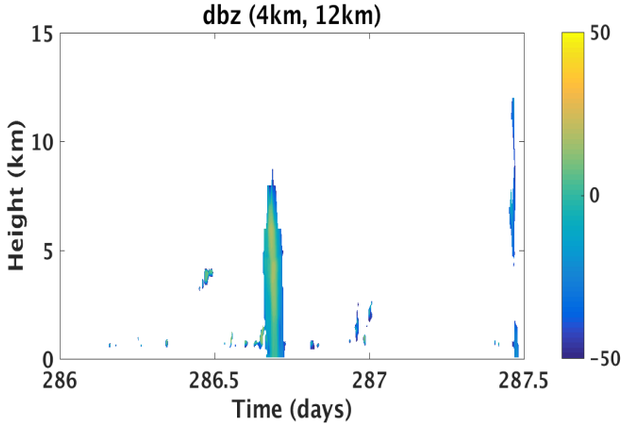

dbz (28km, 28km)
Height (km)
Time (days)

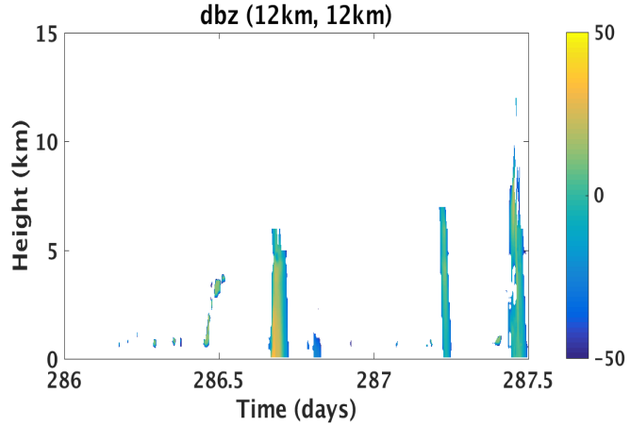

dbz (4km, 20km)
Height (km)
Time (days)

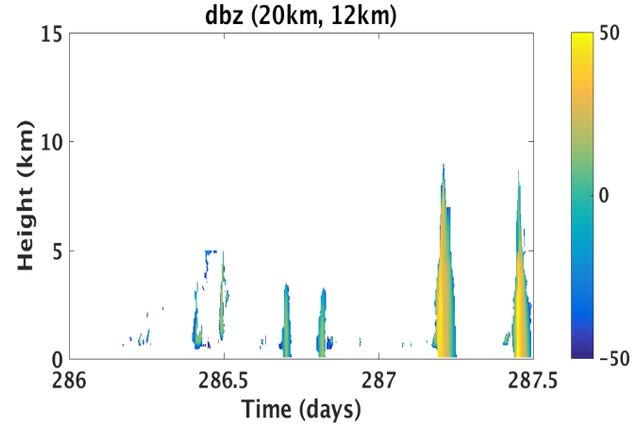

dbz (12km, 20km)
Height (km)
Time (days)

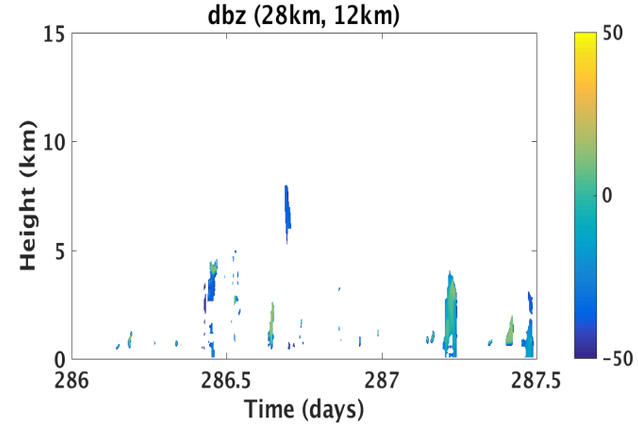

dbz (20km, 20km)
Height (km)
Time (days)

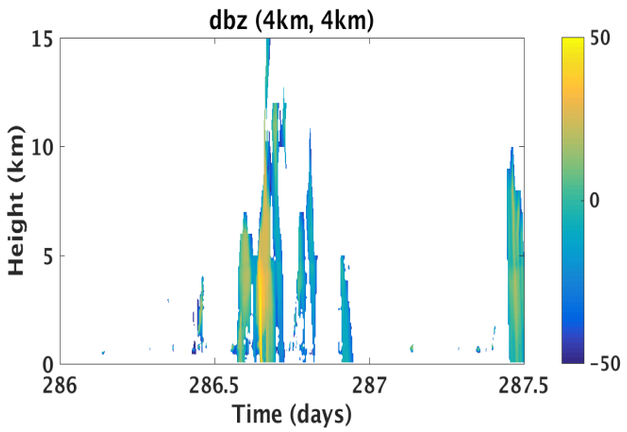

dbz (28km, 20km)
Height (km)
Time (days)

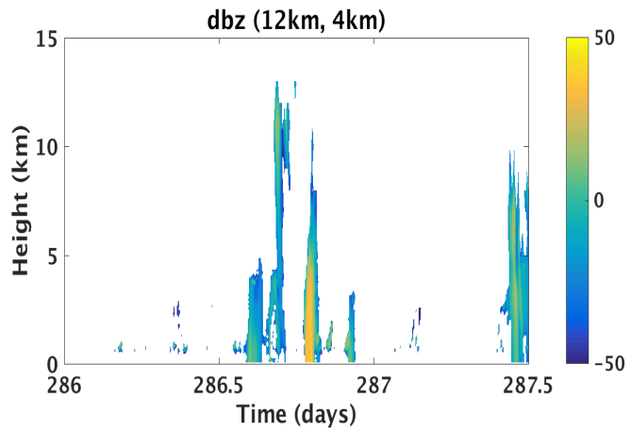

dbz (4km, 12km)
Height (km)
Time (days)

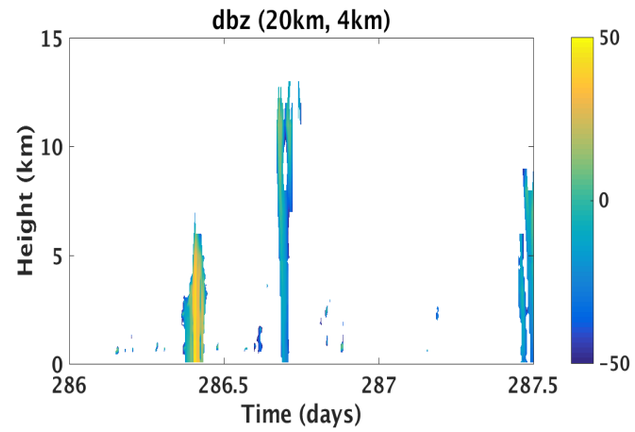

dbz (12km, 12km)
Height (km)
Time (days)

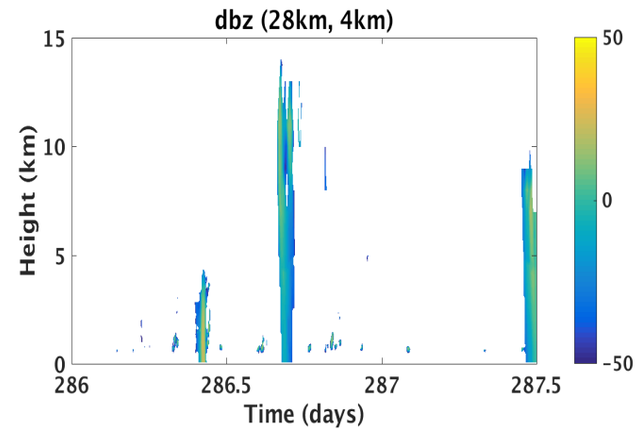

dbz (20km, 12km)
Height (km)
Time (days)

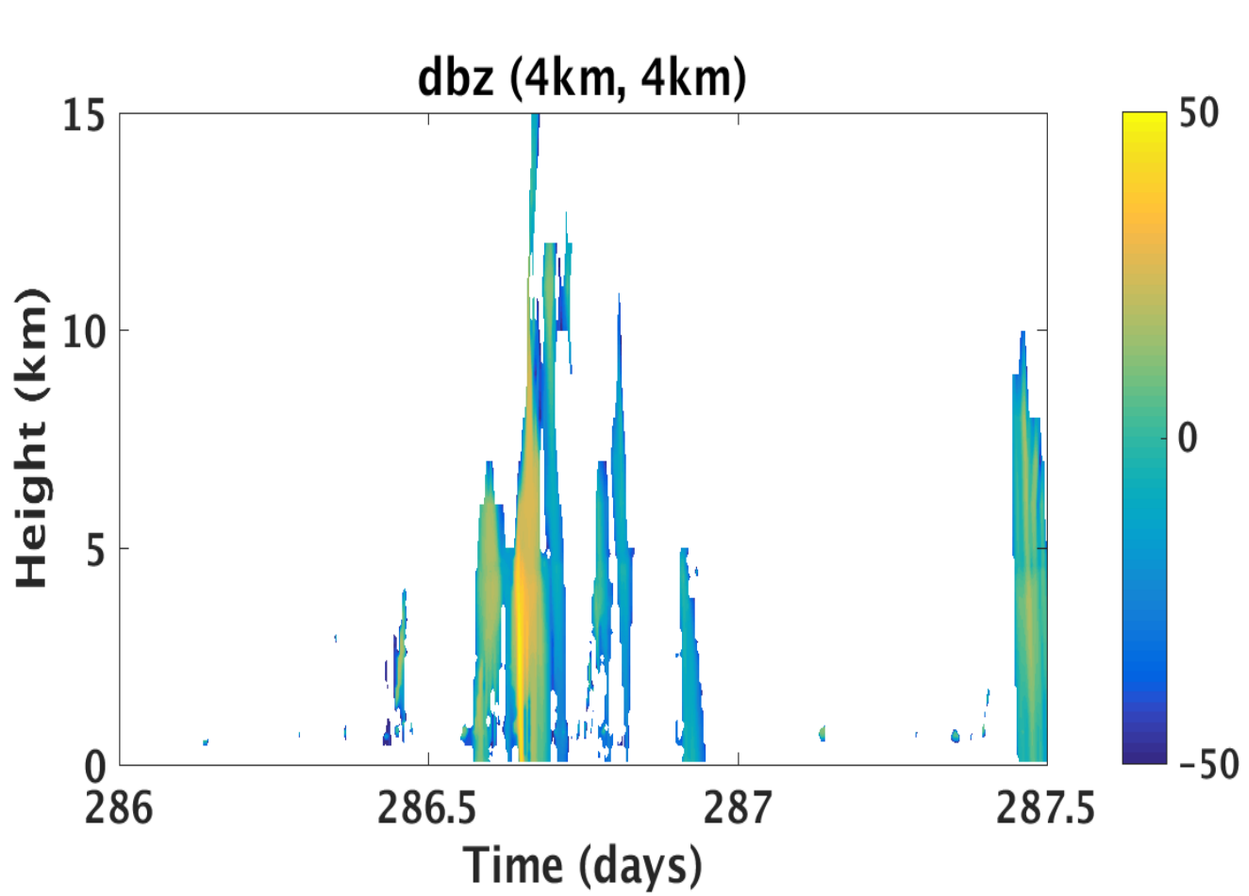

dbz (28km, 12km)
Height (km)
Time (days)

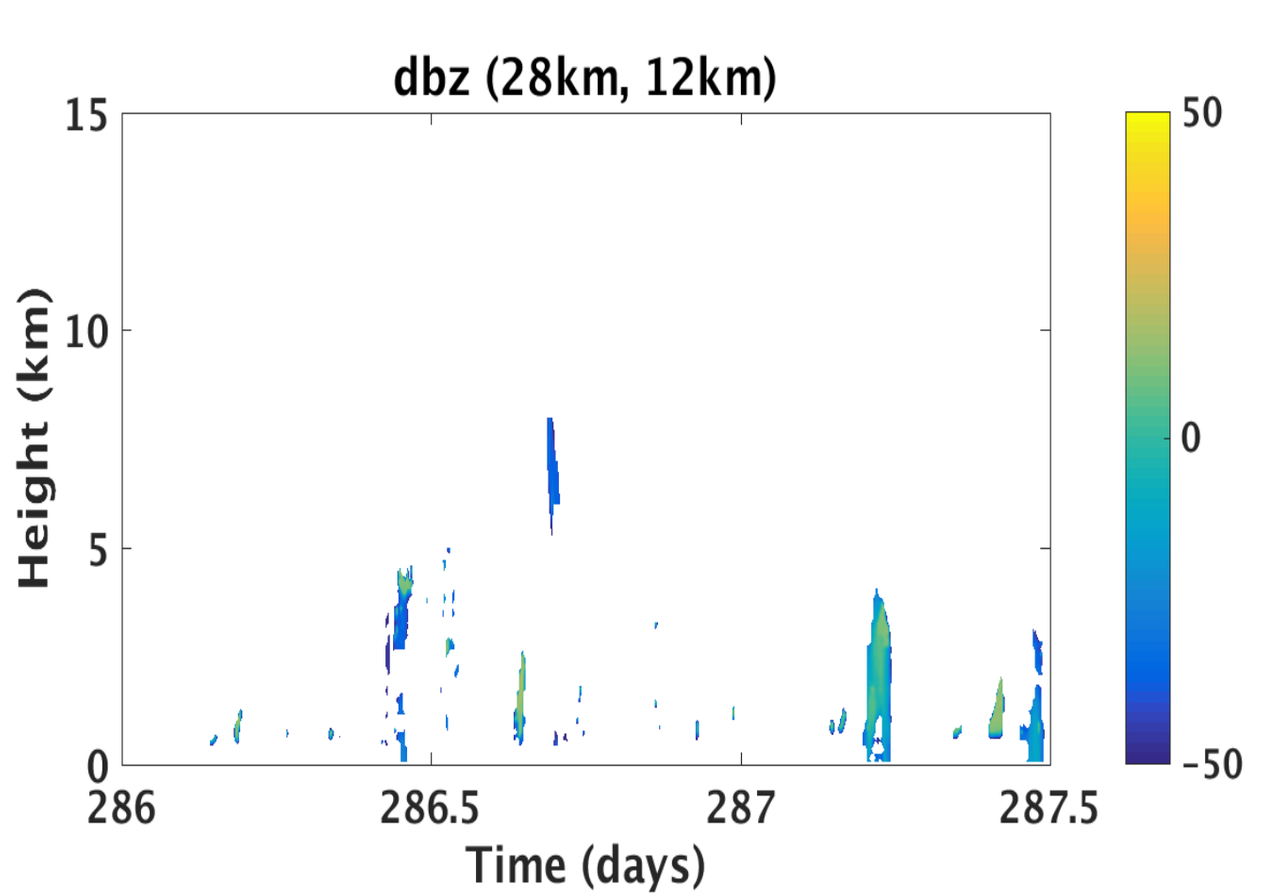

dbz (4km, 4km)
Height (km)
Time (days)


dbz (12km, 4km)
Height (km)
Time (days)


dbz (20km, 4km)
Height (km)
Time (days)

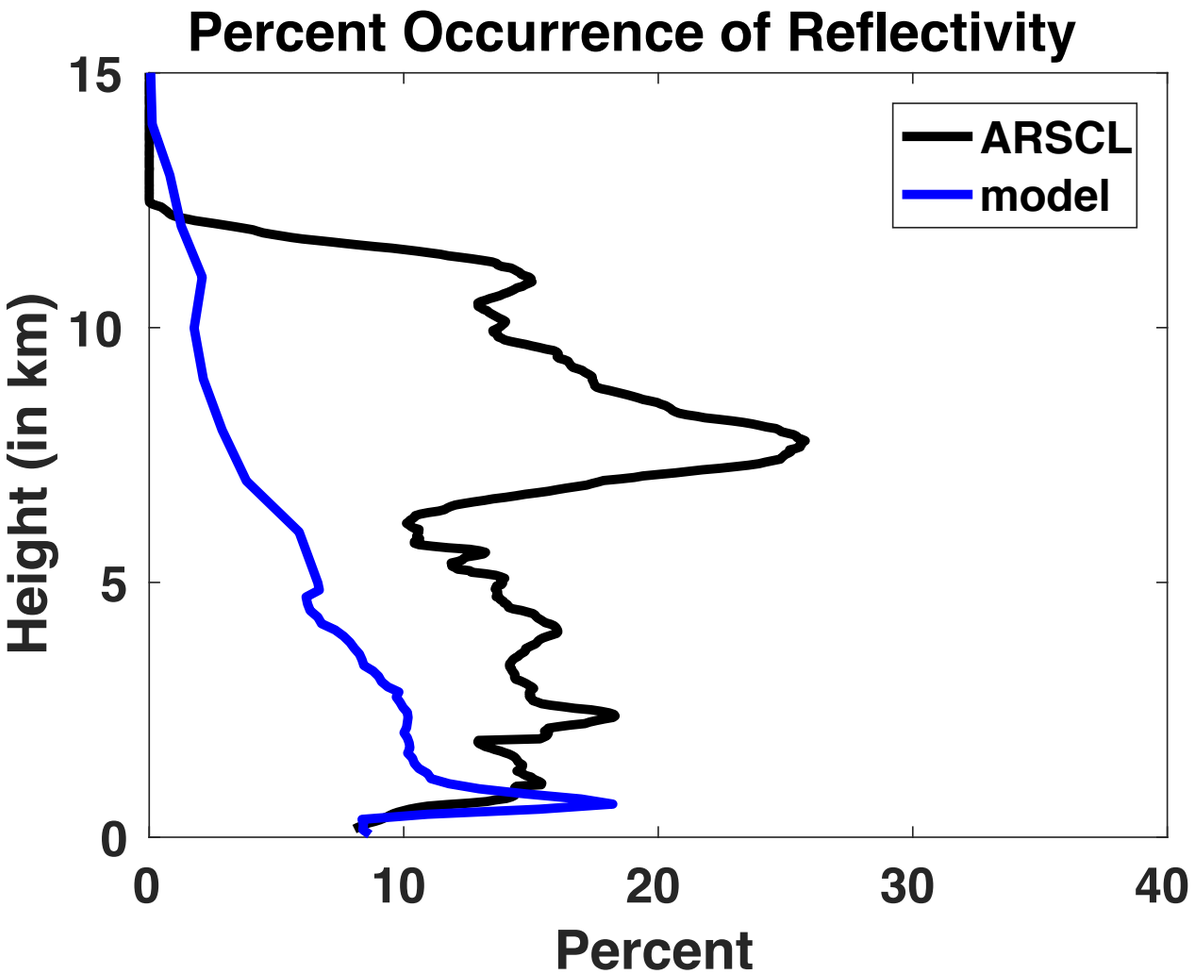

dbz (28km, 4km)
Height (km)
Time (days)

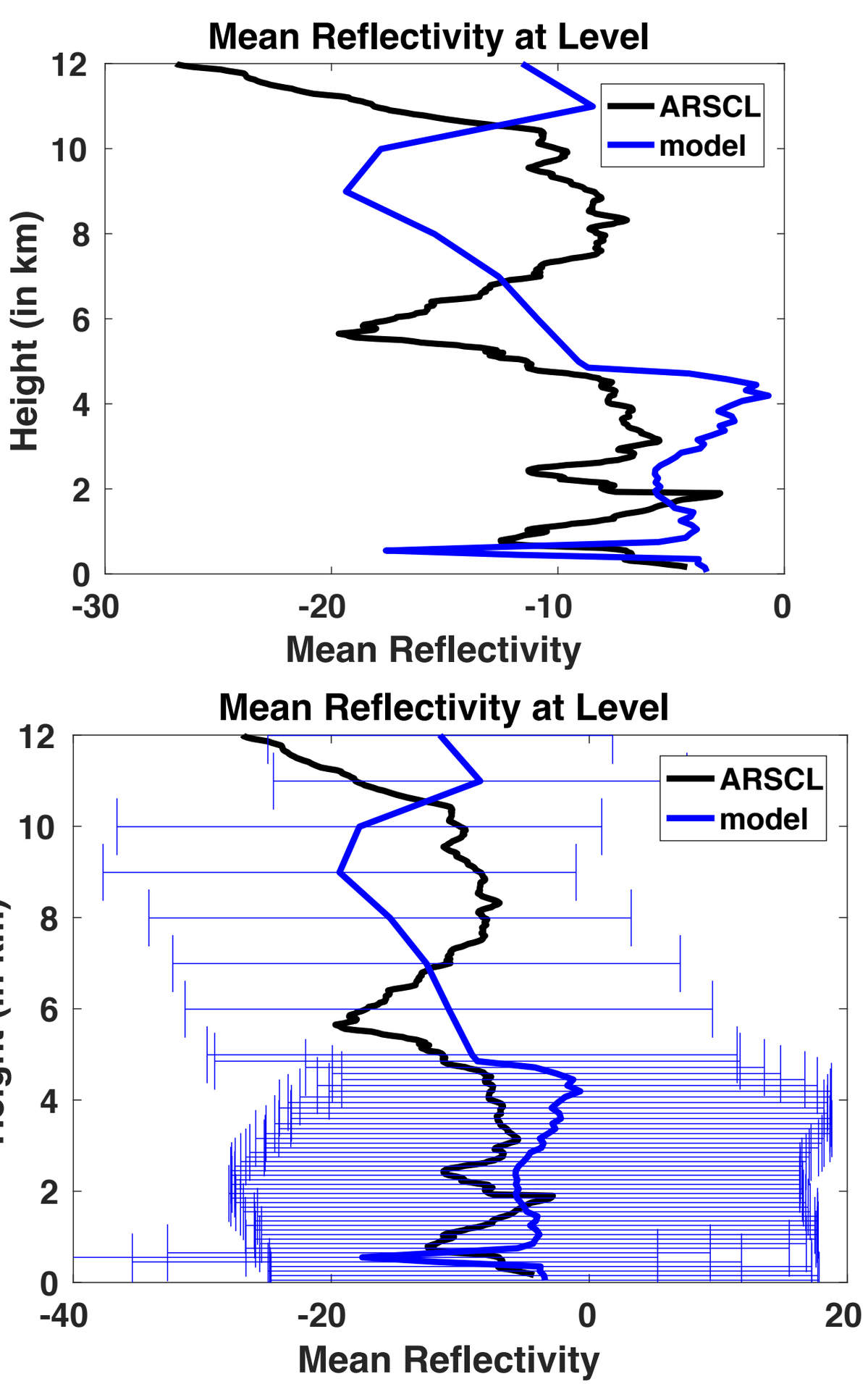

dbz (4km, 4km)
Height (km)
Time (days)
15
10
5
0
286
286.5
287
287.5
50
0
-50


dbz (28km, 12km)
Height (km)
Time (days)
15
10
5
0
286
286.5
287
287.5
50
0
-50

dbz (4km, 4km)
Height (km)
Time (days)
15
10
5
0
286
286.5
287
287.5
50
0
-50
-100

dbz (28km, 12km)
Height (km)
Time (days)
15
10
5
0
286
286.5
287
287.5
50
0
-50
-100


Percent Occurrence of Reflectivity
ARSCL
model
Height (in km)
Percent
0
5
10
15
0
10
20
30
40


Mean Reflectivity at Level
ARSCL
model
Height (in km)
Mean Reflectivity
0
2
4
6
8
10
12
-30
-20
-10
0
Mean Reflectivity at Level
ARSCL
model
Height (in km)
Mean Reflectivity
0
2
4
6
8
10
12
-40
-20
0
20