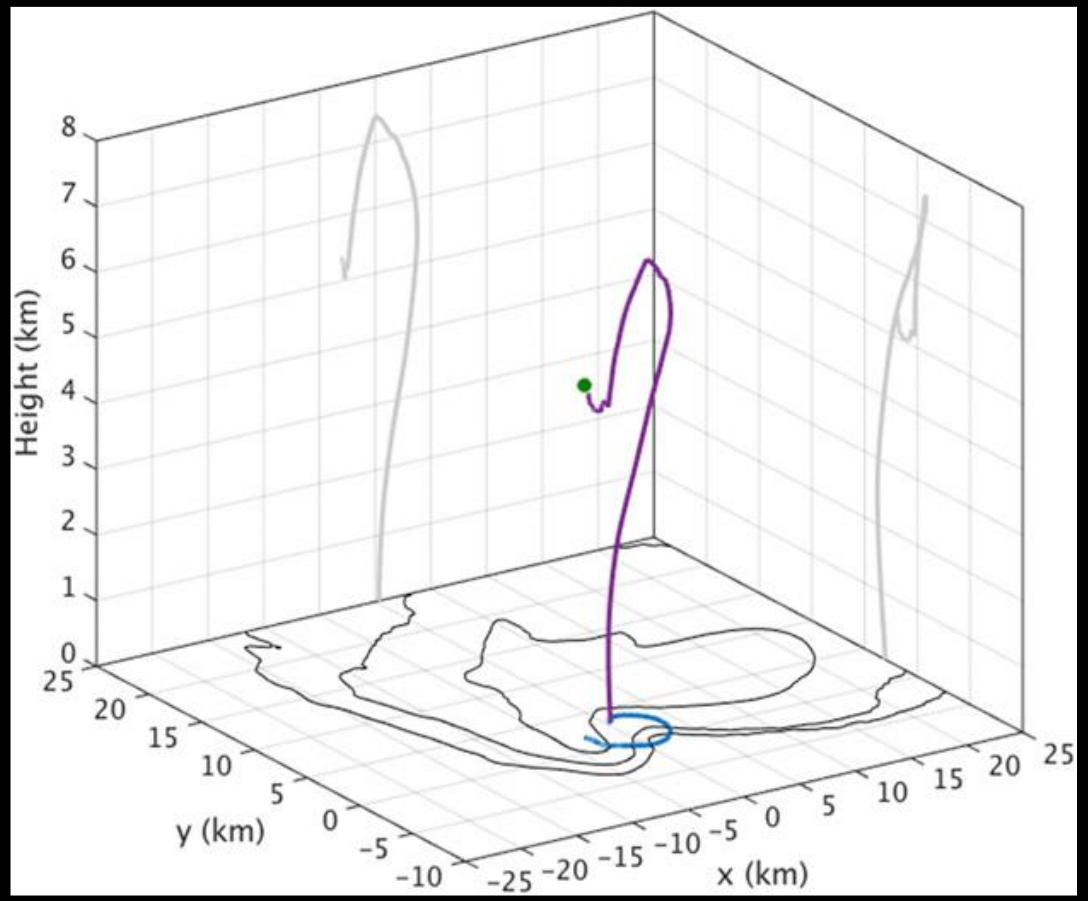
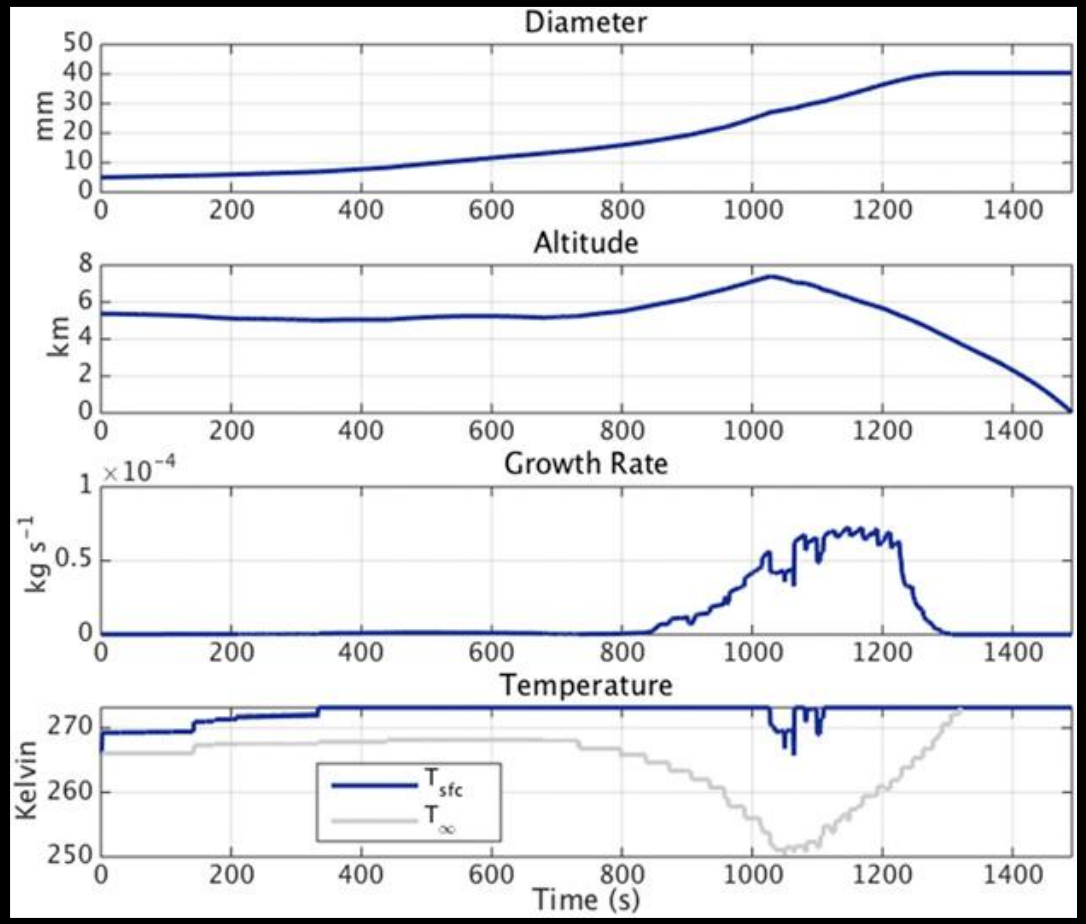
Assessment of Layer Averaged Dual Pol Parameters Prior to Texas State Record Hailstone

T. J. Turnage

NWS Grand Rapids, MI

thomas.turnage@noaa.gov





Modeling suggests that largest Growth Rate for giant hail occurs towards the end of its descent through the "warmer" part of the hail growth region

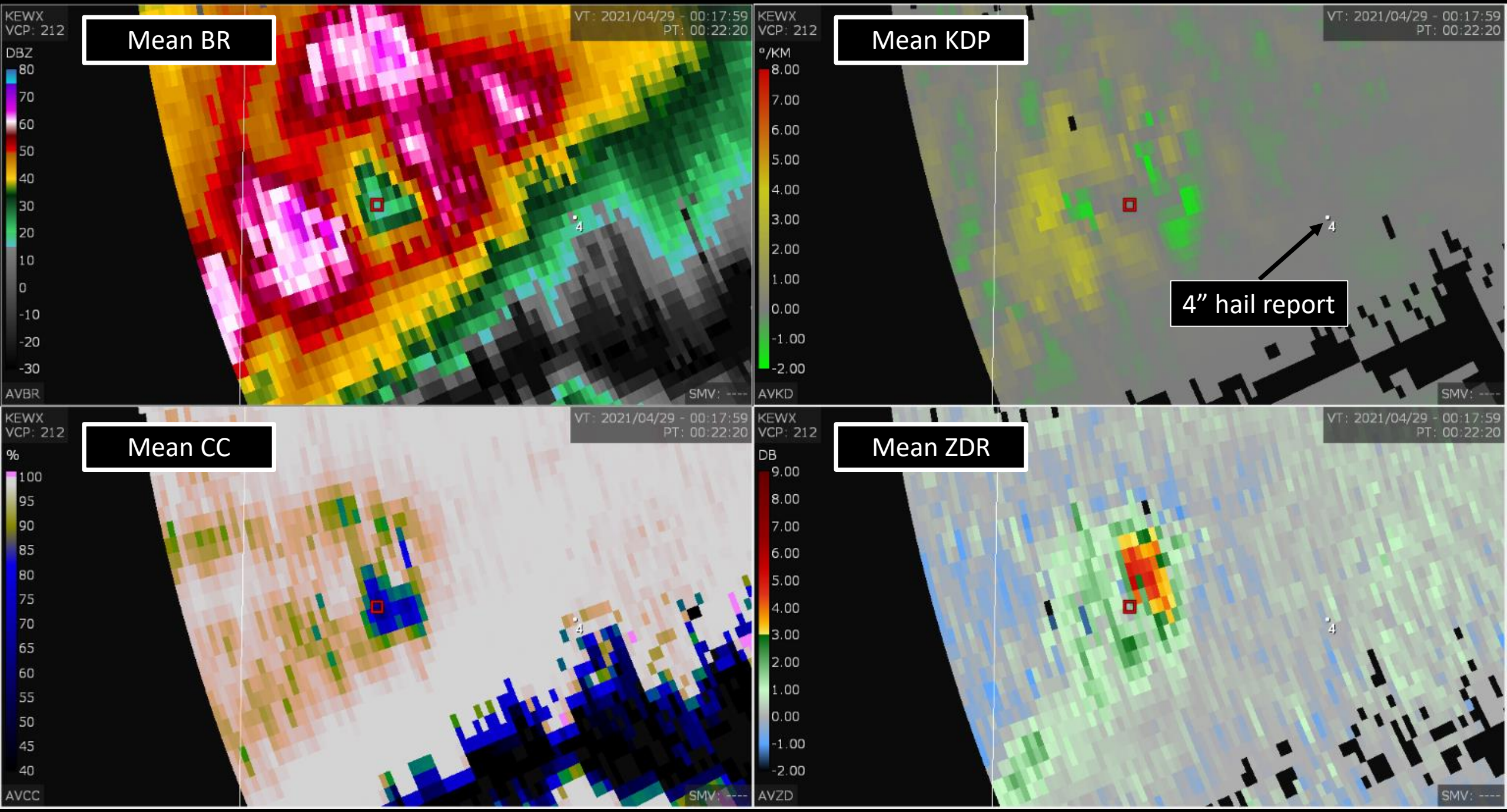
Kumjian, M. R. and K. Lombardo, 2020: A hail growth trajectory model for exploring the environmental controls on hail size: Model physics & idealized tests. *Journal of the Atmospheric Sciences*, 77, 2765-2791. DOI: 10.1175/JAS-D-20-0016.1. (Link)

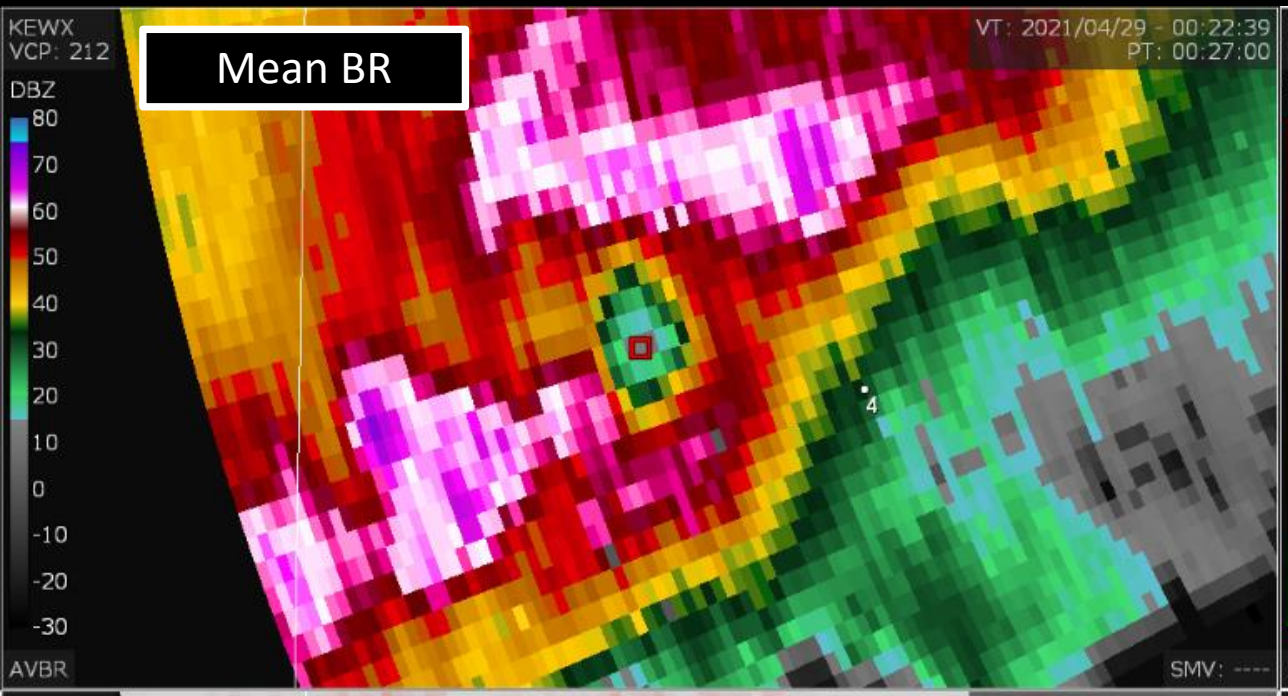
Layer Averaging Calculations Done with GR2Analyst Version 3 User Defined Products (link)

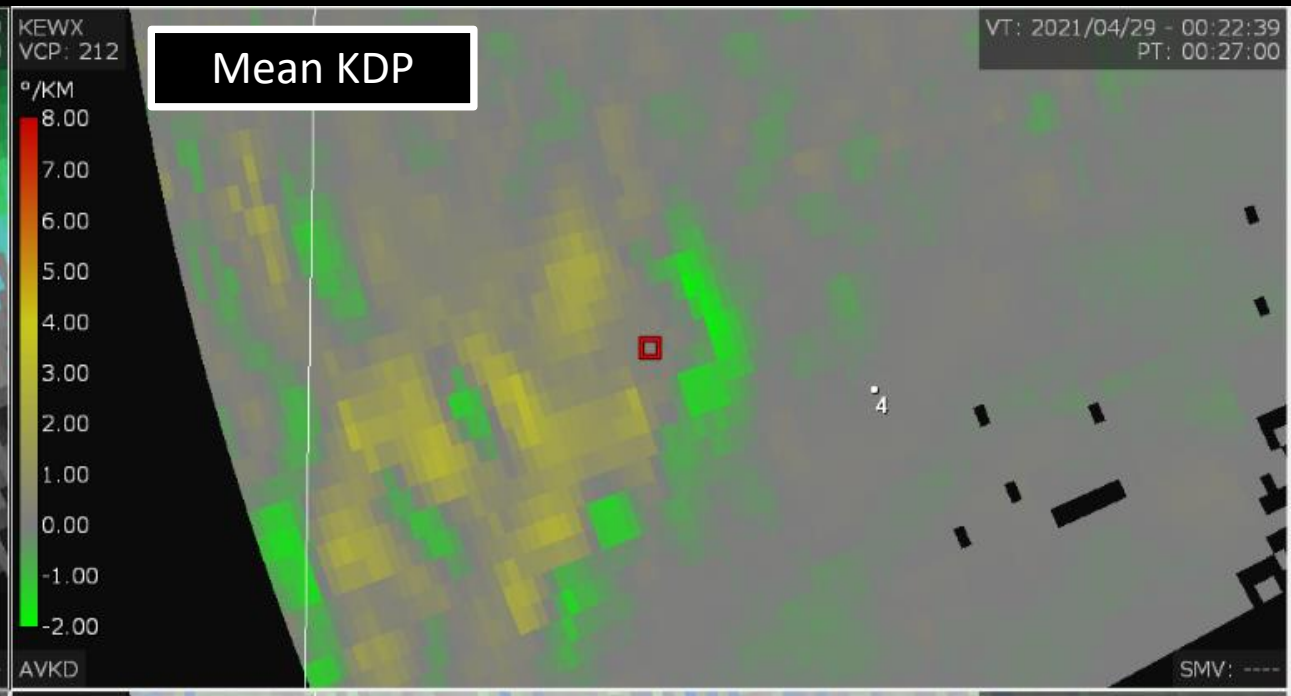
Layer Average

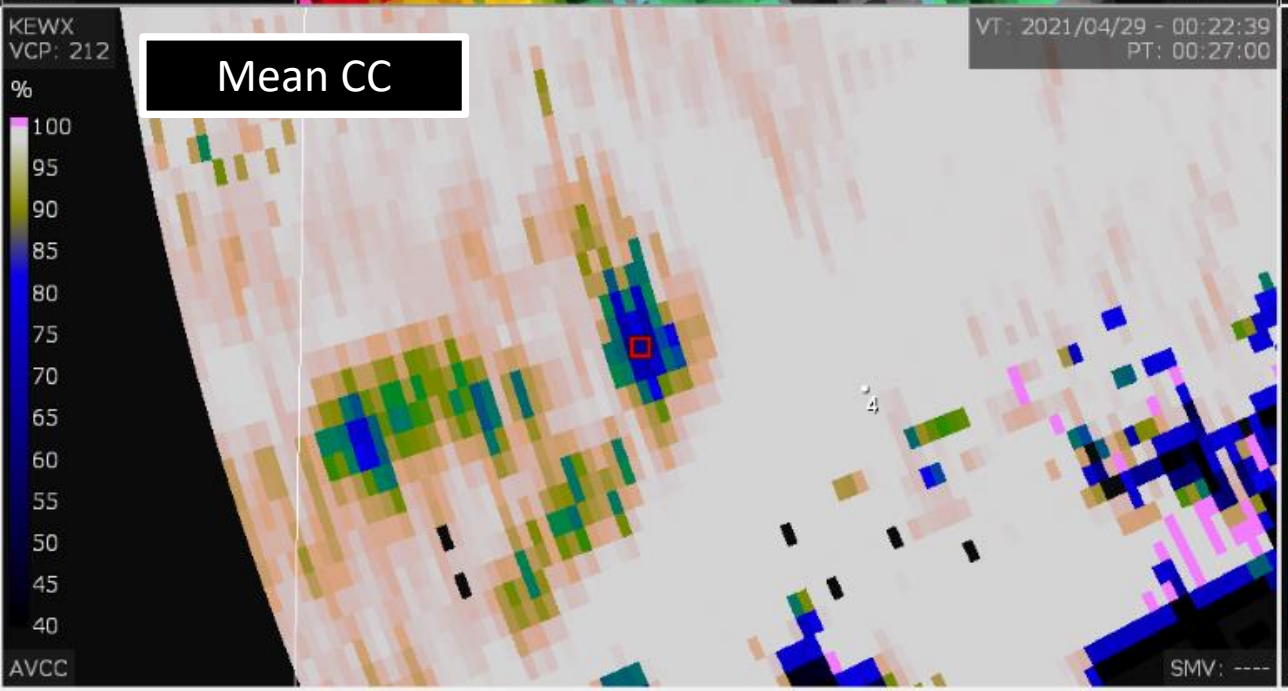
-5C to -15C

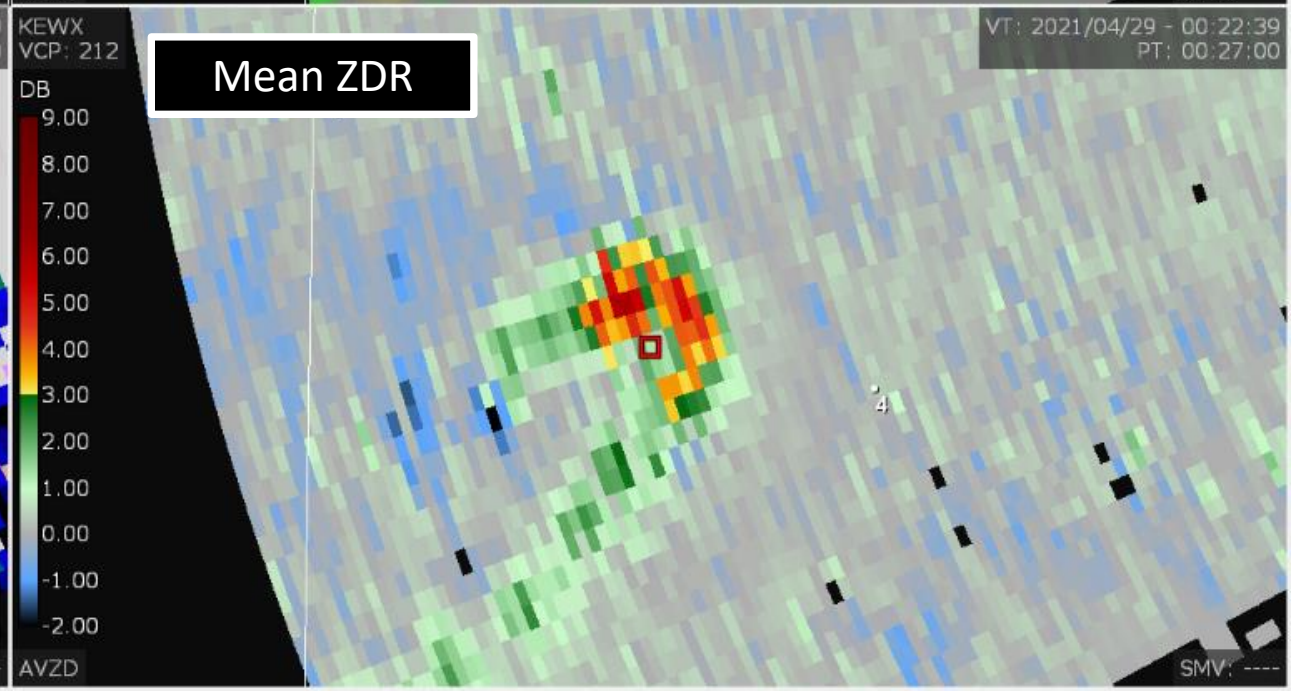
more skillful

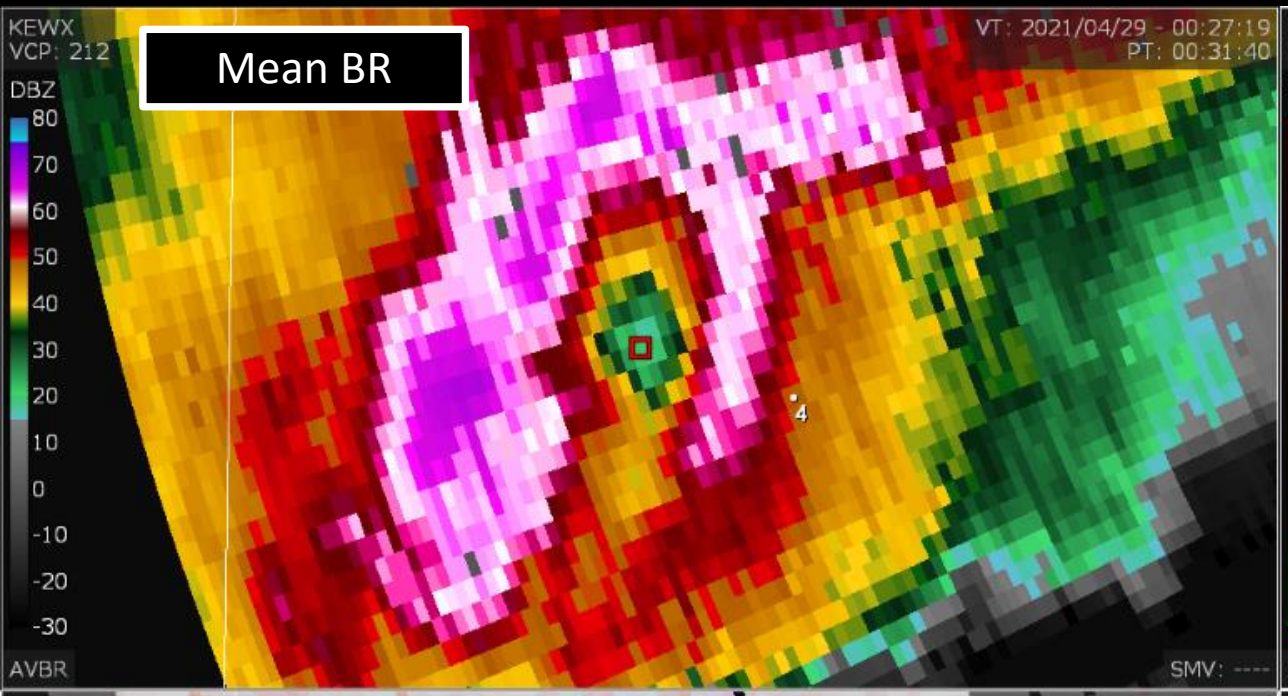

Mean BR
KEWX
VCP: 212
VT: 2021/04/29 - 00:17:59
PT: 00:22:20
DBZ
80
70
60
50
40
30
20
10
0
-10
-20
-30
AVBR
SMV: ----
Mean KDP
°/KM
8.00
7.00
6.00
5.00
4.00
3.00
2.00
1.00
0.00
-1.00
-2.00
AVKD
4" hail report
Mean CC
%
100
95
90
85
80
75
70
65
60
55
50
45
40
AVCC
Mean ZDR
DB
9.00
8.00
7.00
6.00
5.00
4.00
3.00
2.00
1.00
0.00
-1.00
-2.00
AVZD


KEWX
VCP: 212
Mean BR
VT: 2021/04/29 - 00:22:39
PT: 00:27:00
DBZ
80
70
60
50
40
30
20
10
0
-10
-20
-30
AVBR
SMV: ----


KEWX
VCP: 212
Mean KDP
VT: 2021/04/29 - 00:22:39
PT: 00:27:00
°/KM
8.00
7.00
6.00
5.00
4.00
3.00
2.00
1.00
0.00
-1.00
-2.00
AVKD
SMV: ----


KEWX
VCP: 212
Mean CC
VT: 2021/04/29 - 00:22:39
PT: 00:27:00
%
100
95
90
85
80
75
70
65
60
55
50
45
40
AVCC
SMV: ----


KEWX
VCP: 212
Mean ZDR
VT: 2021/04/29 - 00:22:39
PT: 00:27:00
DB
9.00
8.00
7.00
6.00
5.00
4.00
3.00
2.00
1.00
0.00
-1.00
-2.00
AVZD
SMV: ----


Mean BR
KEWX
VCP: 212
VT: 2021/04/29 - 00:27:19
PT: 00:31:40
DBZ
80
70
60
50
40
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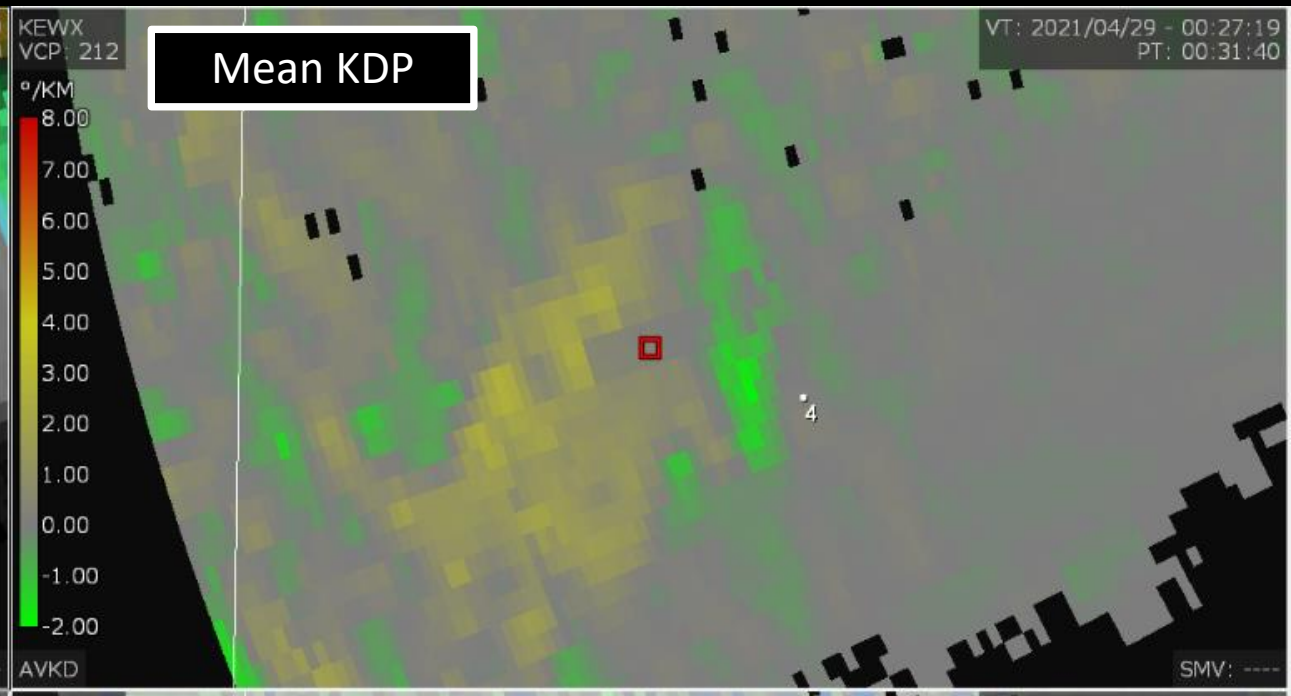
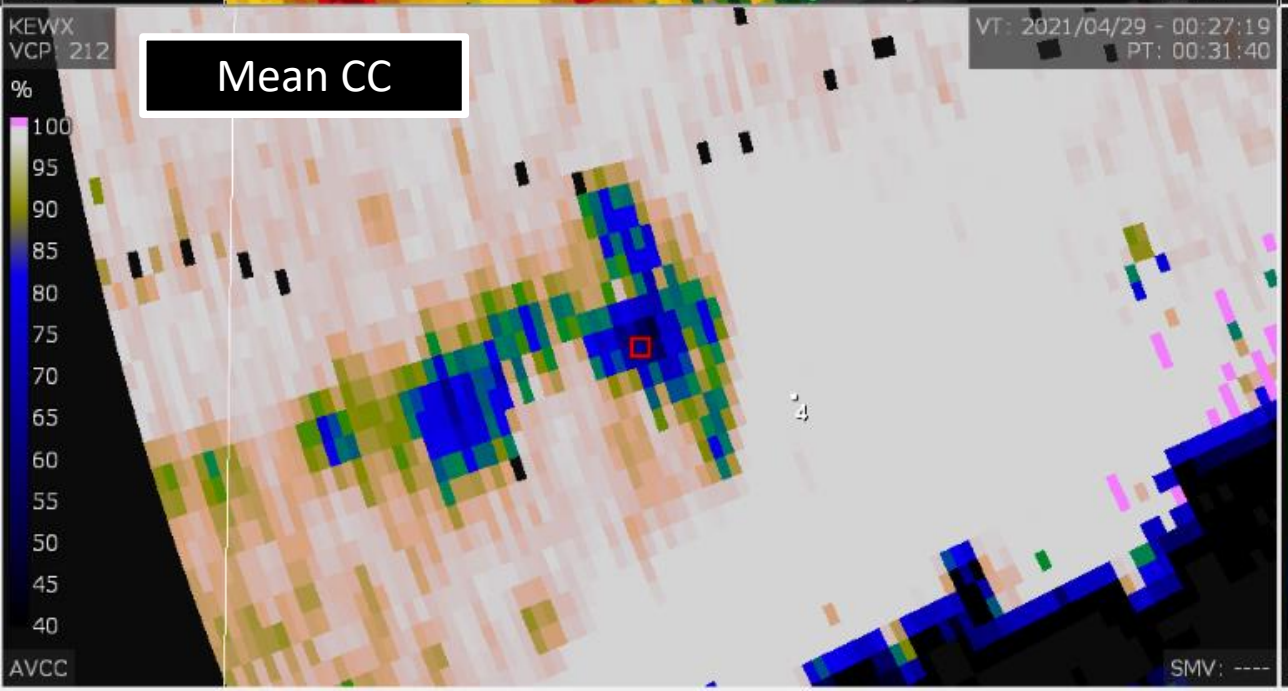
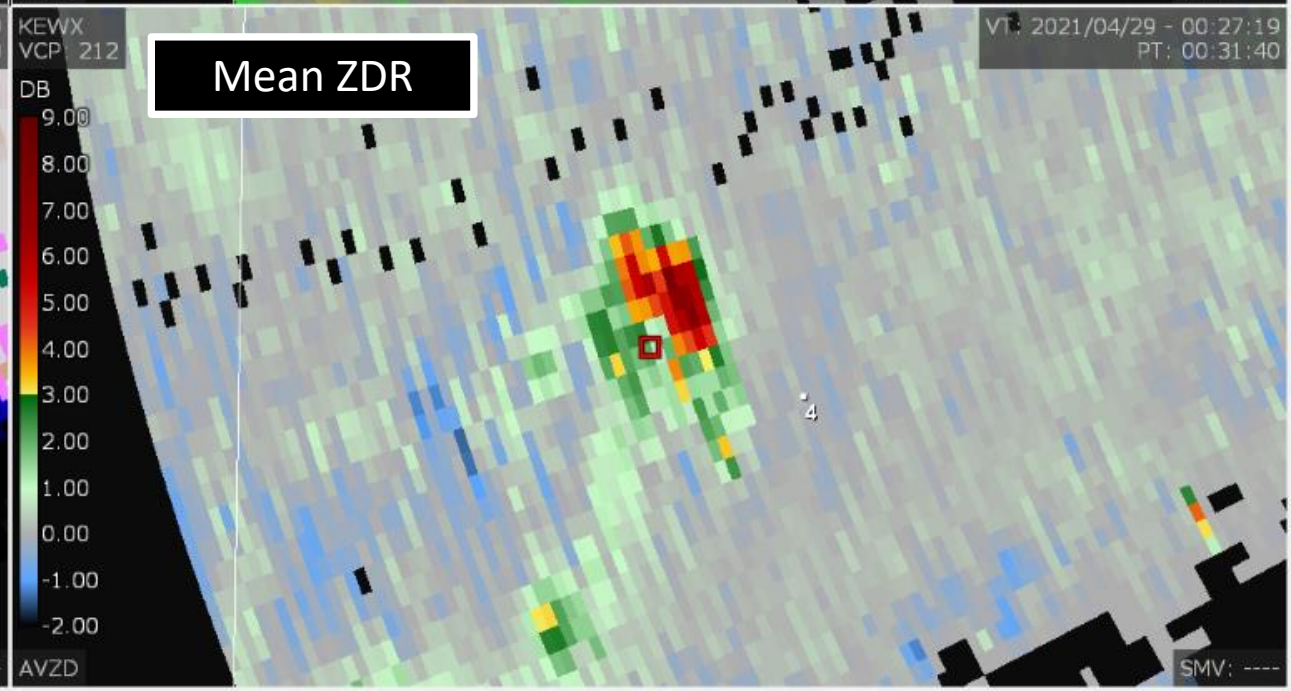
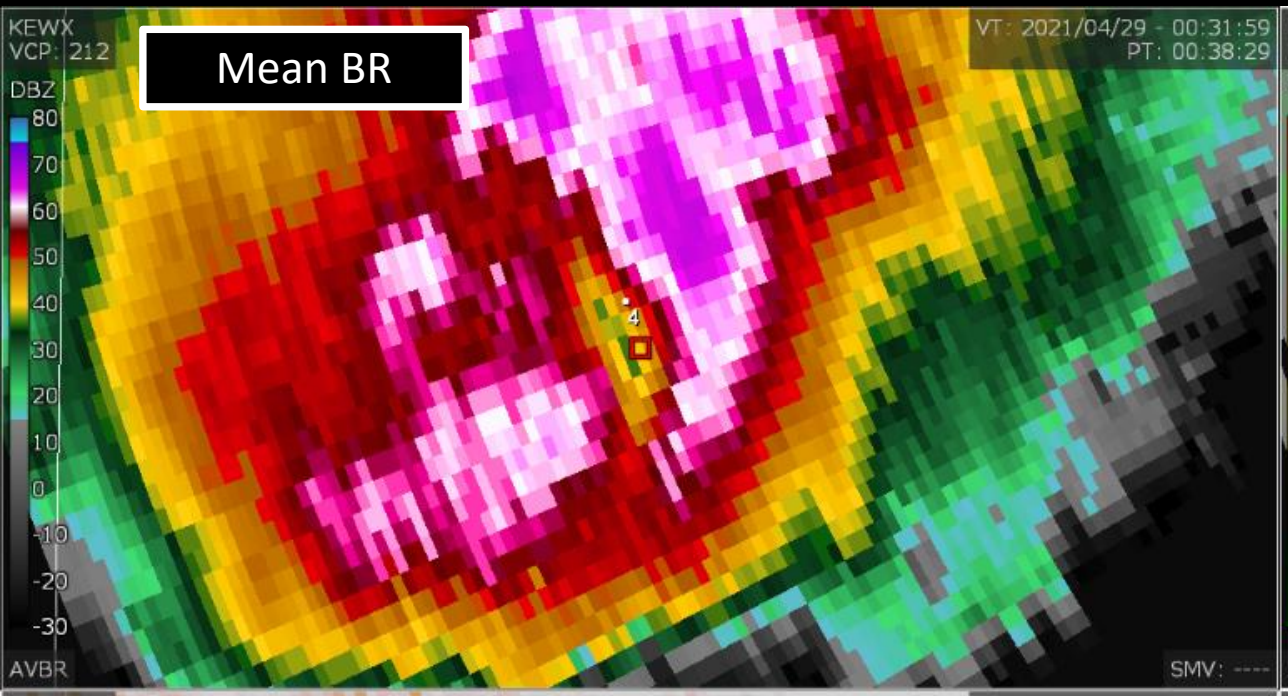
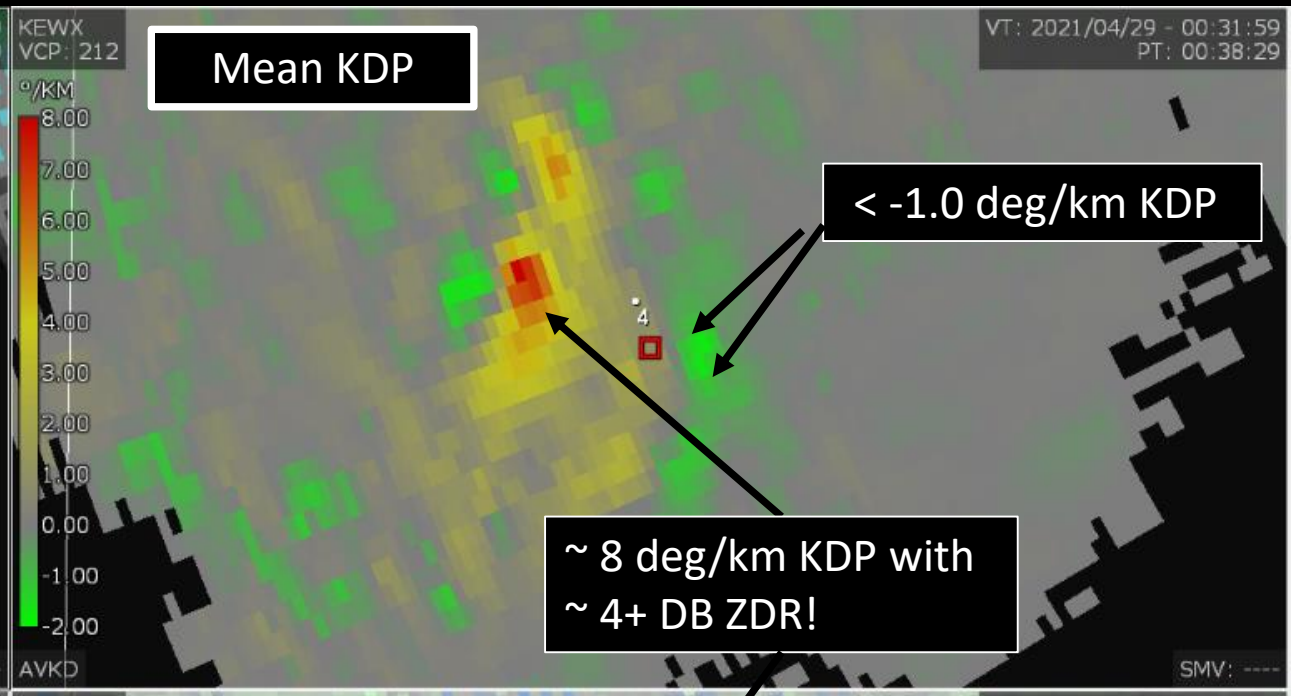
10
0
-10
-20
-30
AVBR
SMV: ----

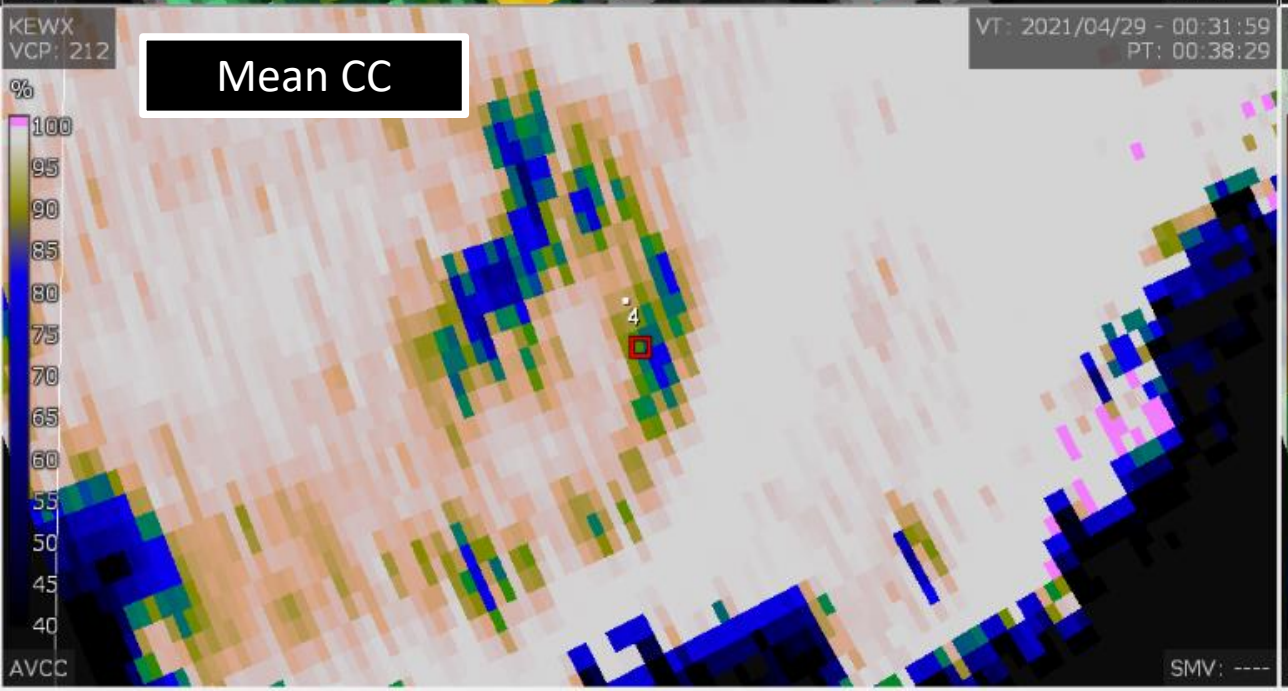

Mean KDP
KEWX
VCP: 212
VT: 2021/04/29 - 00:27:19
PT: 00:31:40
°/KM
8.00
7.00
6.00
5.00
4.00
3.00
2.00
1.00
0.00
-1.00
-2.00
AVKD
SMV: ----

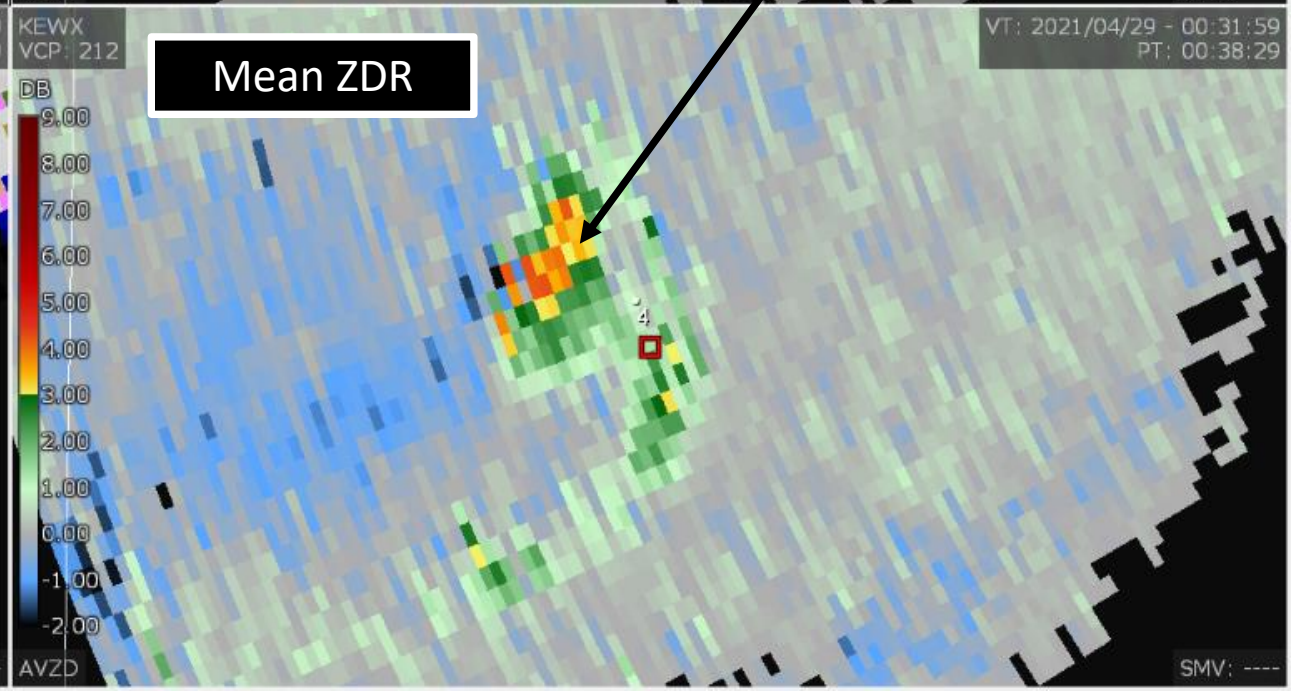

Mean CC
KEWX
VCP: 212
VT: 2021/04/29 - 00:27:19
PT: 00:31:40
%
100
95
90
85
80
75
70
65
60
55
50
45
40
AVCC
SMV: ----


Mean ZDR
KEWX
VCP: 212
VT: 2021/04/29 - 00:27:19
PT: 00:31:40
DB
9.00
8.00
7.00
6.00
5.00
4.00
3.00
2.00
1.00
0.00
-1.00
-2.00
AVZD
SMV: ----


KEWX
VCP: 212
VT: 2021/04/29 - 00:31:59
PT: 00:38:29
Mean BR
DBZ
80
70
60
50
40
30
20
10
0
-10
-20
-30
AVBR
SMV: ----


KEWX
VCP: 212
VT: 2021/04/29 - 00:31:59
PT: 00:38:29
Mean KDP
°/KM
8.00
7.00
6.00
5.00
4.00
3.00
2.00
1.00
0.00
-1.00
-2.00
AVKD
SMV: ----
< -1.0 deg/km KDP
~ 8 deg/km KDP with
~ 4+ DB ZDR!

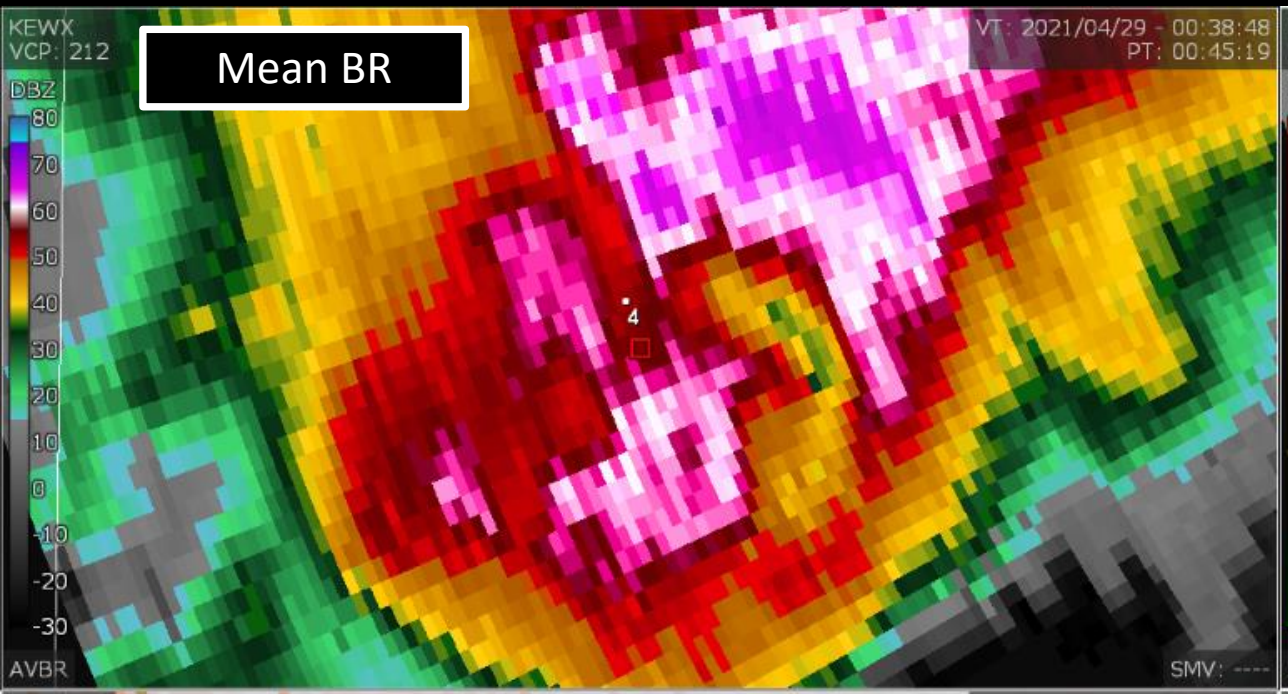

KEWX
VCP: 212
VT: 2021/04/29 - 00:31:59
PT: 00:38:29
Mean CC
%
100
95
90
85
80
75
70
65
60
55
50
45
40
AVCC
SMV: ----


KEWX
VCP: 212
VT: 2021/04/29 - 00:31:59
PT: 00:38:29
Mean ZDR
DB
9.00
8.00
7.00
6.00
5.00
4.00
3.00
2.00
1.00
0.00
-1.00
-2.00
AVZD
SMV: ----

Layer Average

-10C to -30C

less skillful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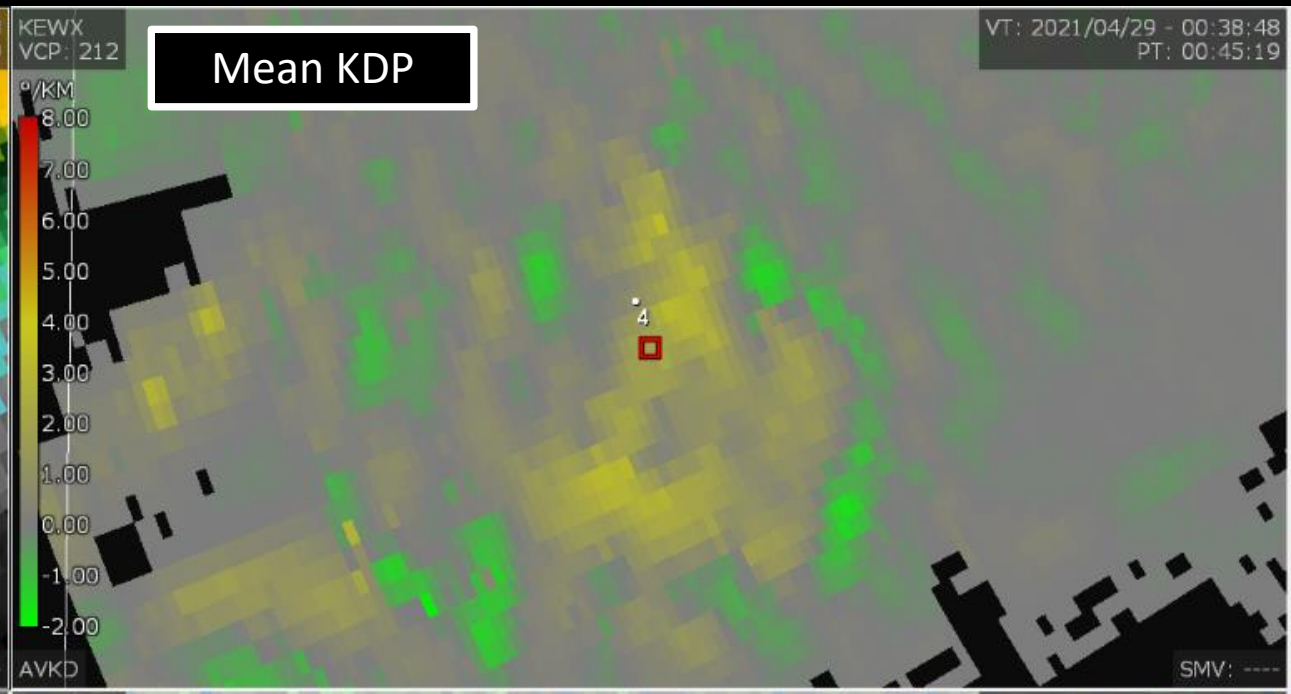
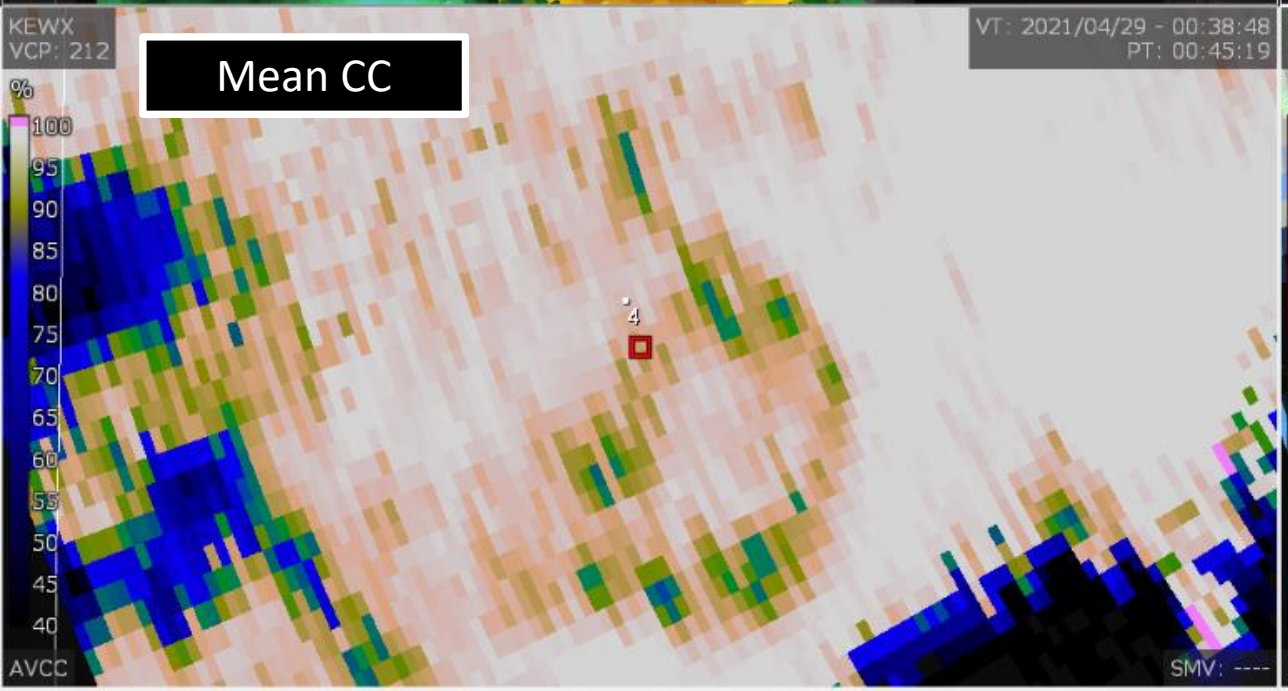
PT: 00:45:19
Mean BR
DBZ
80
70
60
50
40
30
20
10
0
-10
-20
-30
AVBR
SMV: ----


KEWX
VCP: 212
VT: 2021/04/29 - 00:38:48
PT: 00:45:19
Mean KDP
°/KM
8.00
7.00
6.00
5.00
4.00
3.00
2.00
1.00
0.00
-1.00
-2.00
AVKD
SMV: ----


KEWX
VCP: 212
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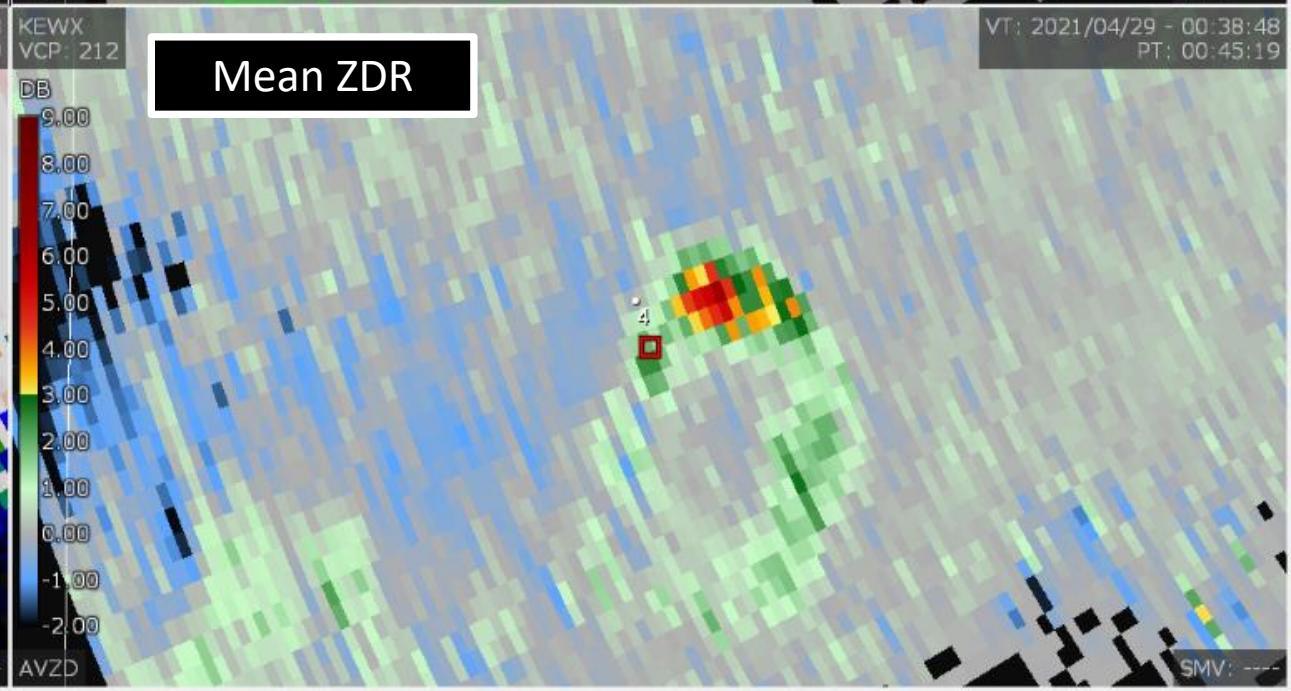
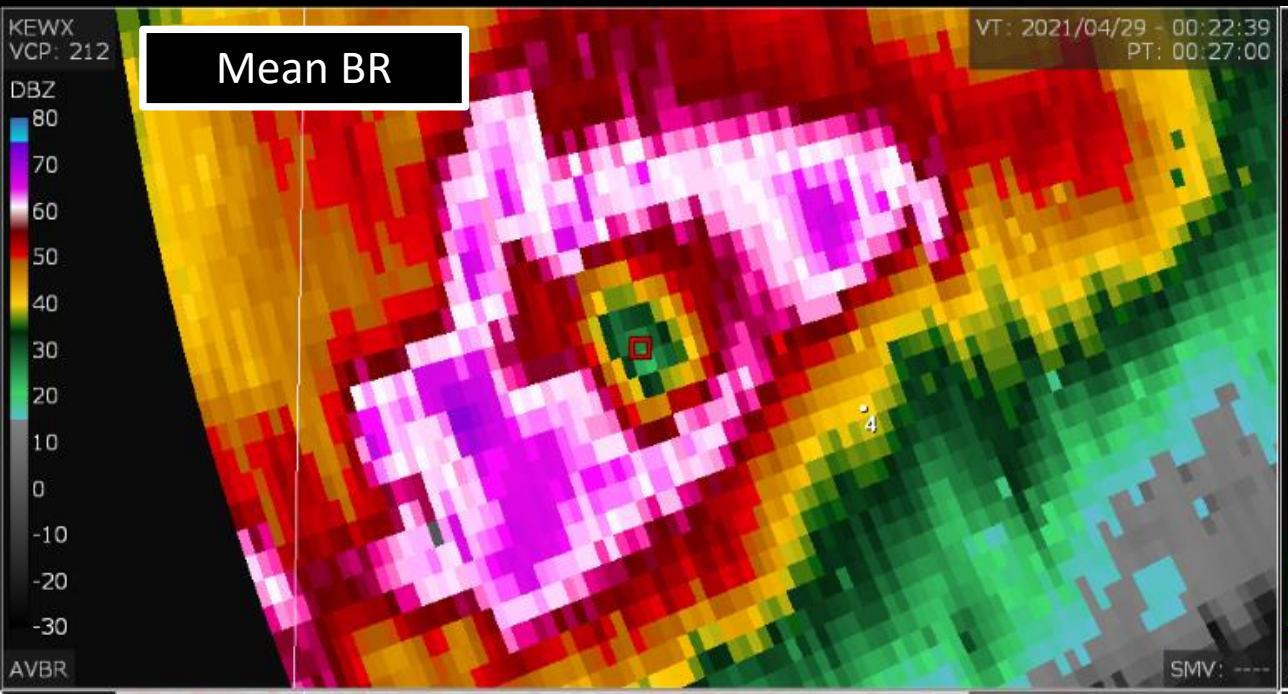
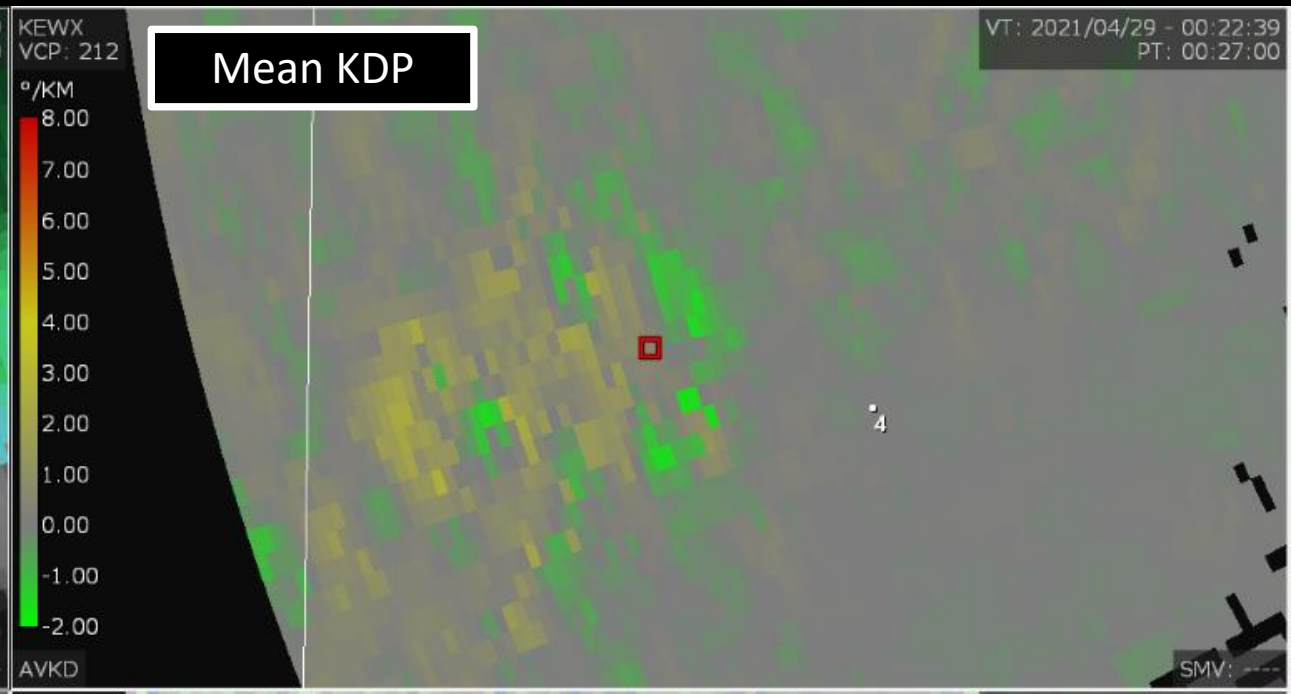
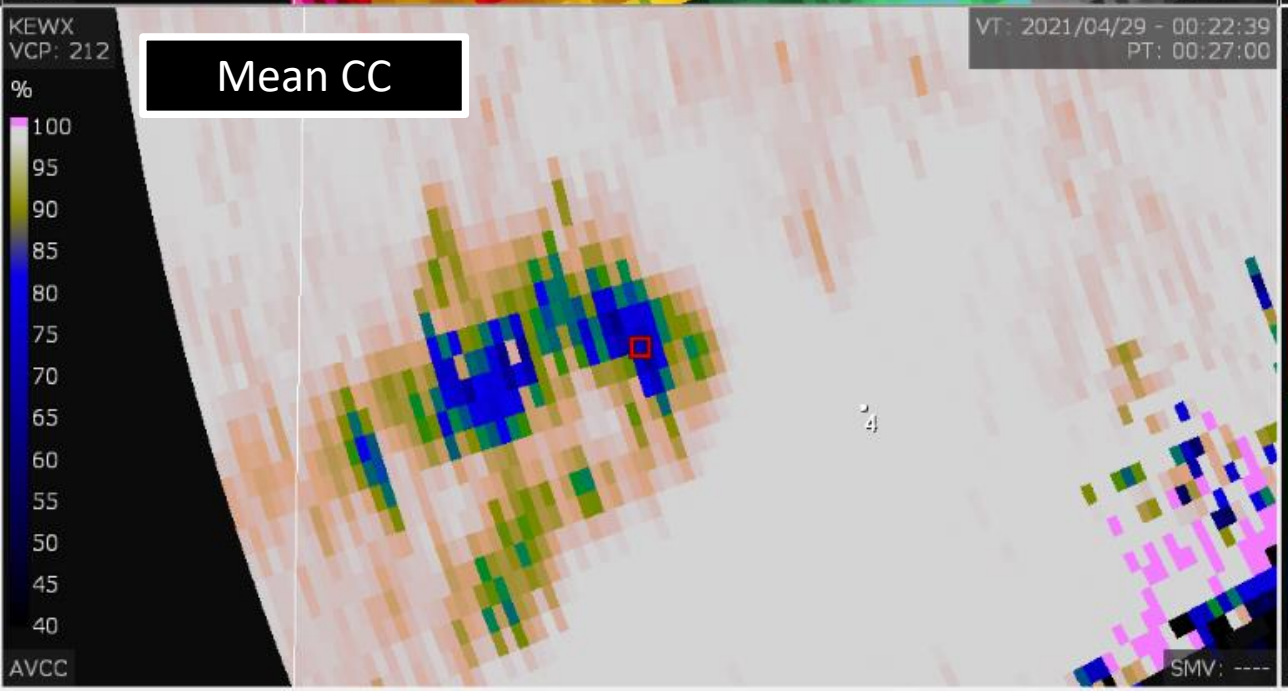
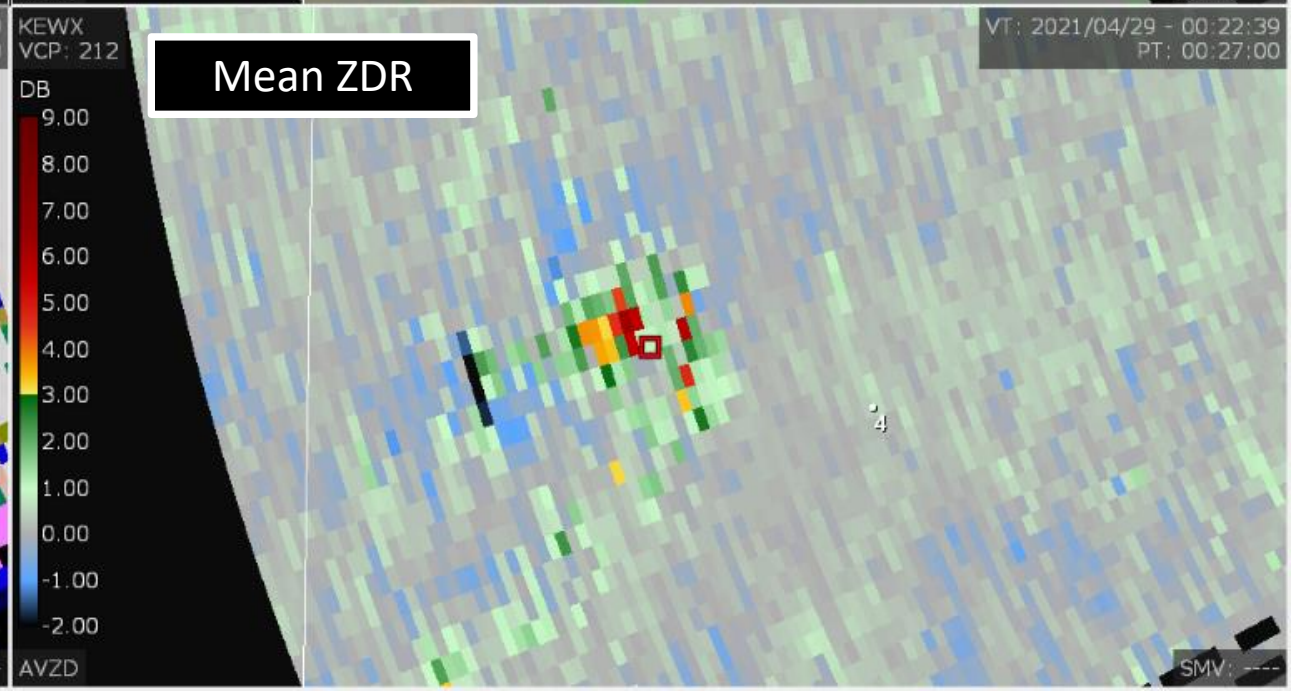
PT: 00:45:19
Mean CC
%
100
95
90
85
80
75
70
65
60
55
50
45
40
AVCC
SMV: ----


KEWX
VCP: 212
VT: 2021/04/29 - 00:38:48
PT: 00:45:19
Mean ZDR
DB
9.00
8.00
7.00
6.00
5.00
4.00
3.00
2.00
1.00
0.00
-1.00
-2.00
AVZD
SMV: ----


Mean BR
KEWX
VCP: 212
VT: 2021/04/29 - 00:22:39
PT: 00:27:00
DBZ
80
70
60
50
40
30
20
10
0
-10
-20
-30
AVBR
SMV: ----


Mean KDP
KEWX
VCP: 212
VT: 2021/04/29 - 00:22:39
PT: 00:27:00
°/KM
8.00
7.00
6.00
5.00
4.00
3.00
2.00
1.00
0.00
-1.00
-2.00
AVKD
SMV: ----


Mean CC
KEWX
VCP: 212
VT: 2021/04/29 - 00:22:39
PT: 00:27:00
%
100
95
90
85
80
75
70
65
60
55
50
45
40
AVCC
SMV: ----


Mean ZDR
KEWX
VCP: 212
VT: 2021/04/29 - 00:22:39
PT: 00:27:00
DB
9.00
8.00
7.00
6.00
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4.00
3.00
2.00
1.00
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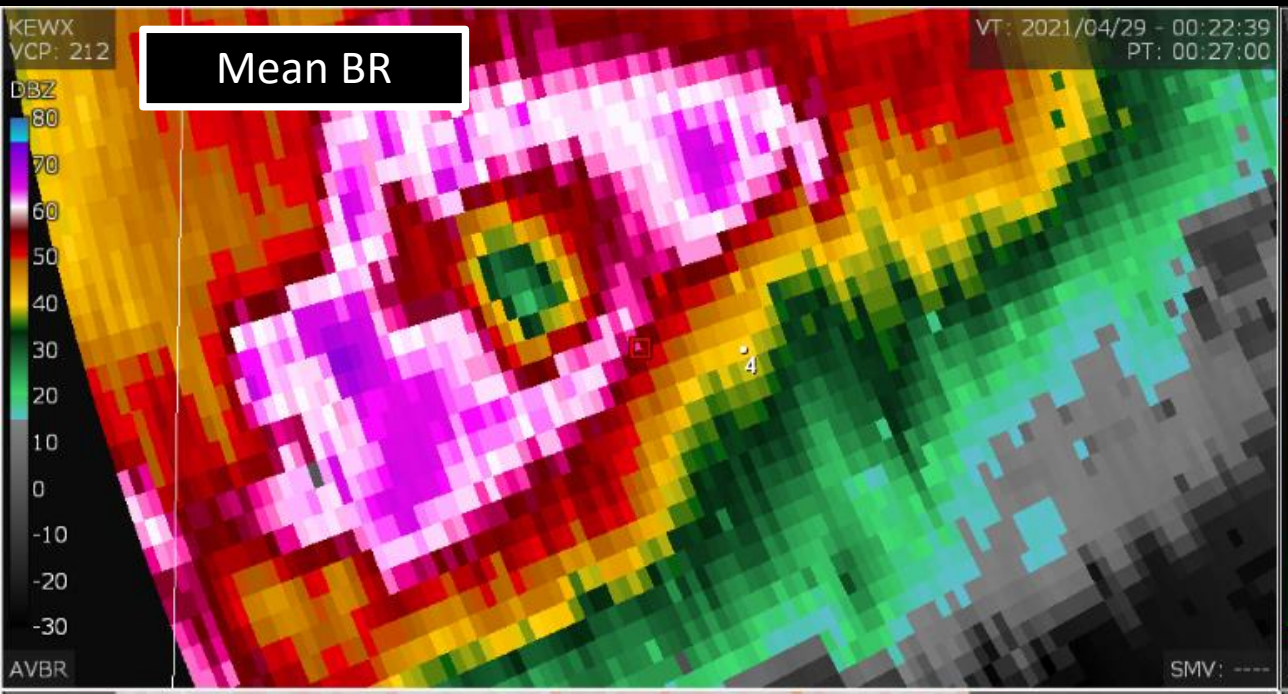
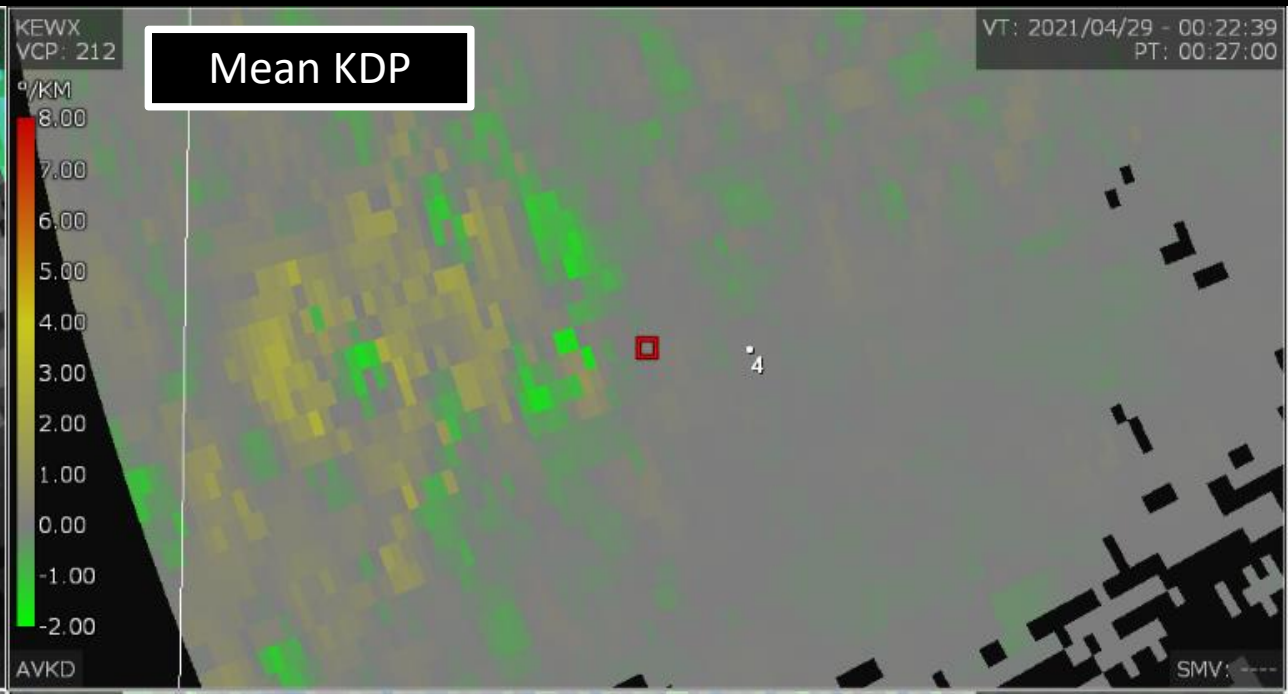
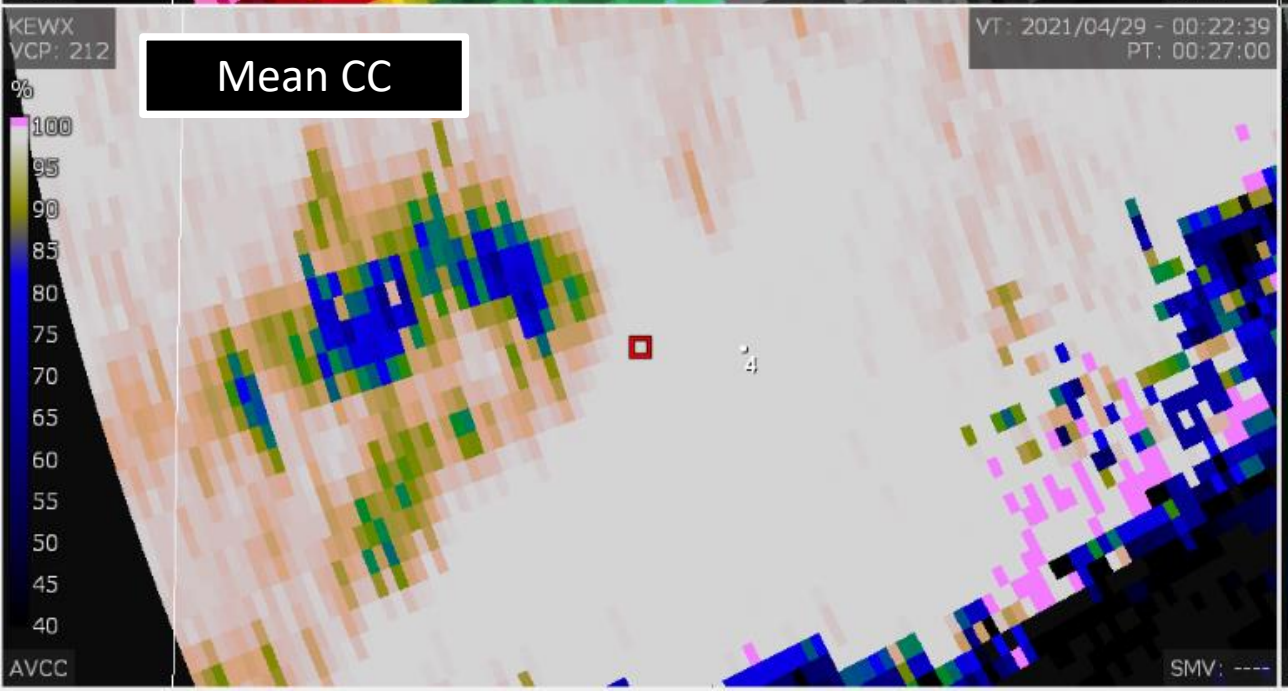
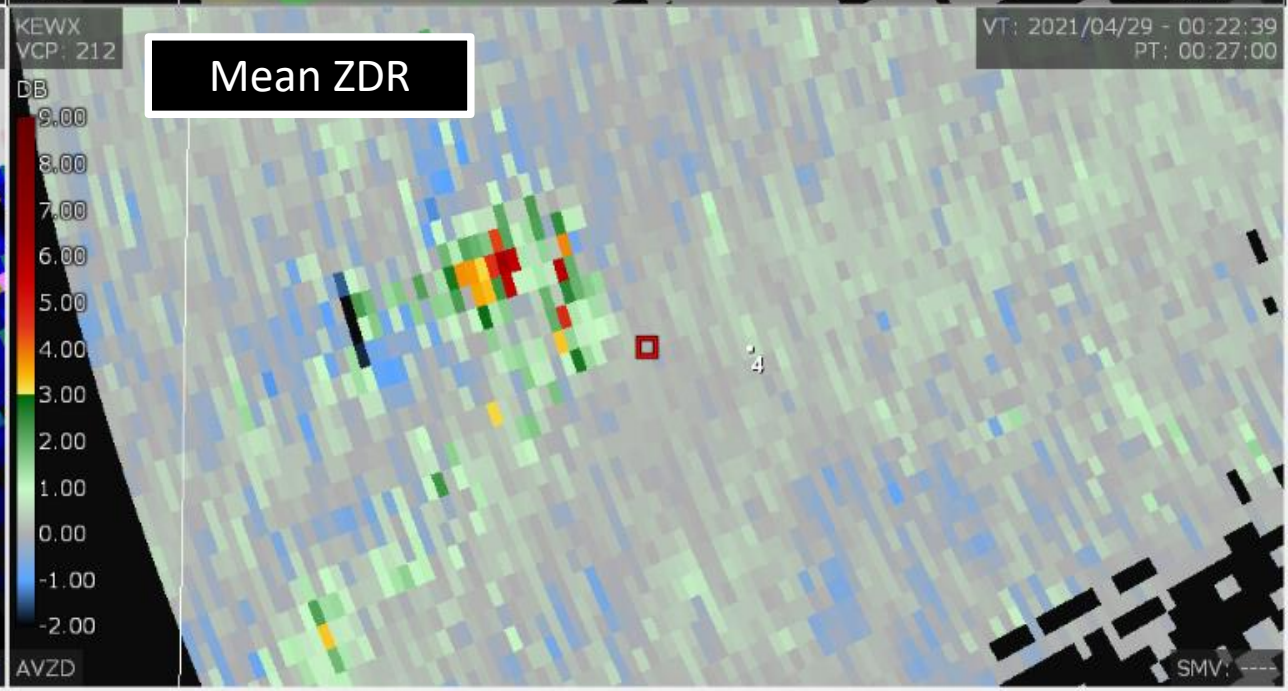
-1.00
-2.00
AVZD
SMV: ----


KEWX
VCP: 212
VT: 2021/04/29 - 00:22:39
PT: 00:27:00
Mean BR
DBZ
80
70
60
50
40
30
20
10
0
-10
-20
-30
AVBR
SMV: ----


KEWX
VCP: 212
VT: 2021/04/29 - 00:22:39
PT: 00:27:00
Mean KDP
°/KM
8.00
7.00
6.00
5.00
4.00
3.00
2.00
1.00
0.00
-1.00
-2.00
AVKD
SMV: ----


KEWX
VCP: 212
VT: 2021/04/29 - 00:22:39
PT: 00:27:00
Mean CC
%
100
95
90
85
80
75
70
65
60
55
50
45
40
AVCC
SMV: ----


KEWX
VCP: 212
VT: 2021/04/29 - 00:22:39
PT: 00:27:00
Mean ZDR
DB
9.00
8.00
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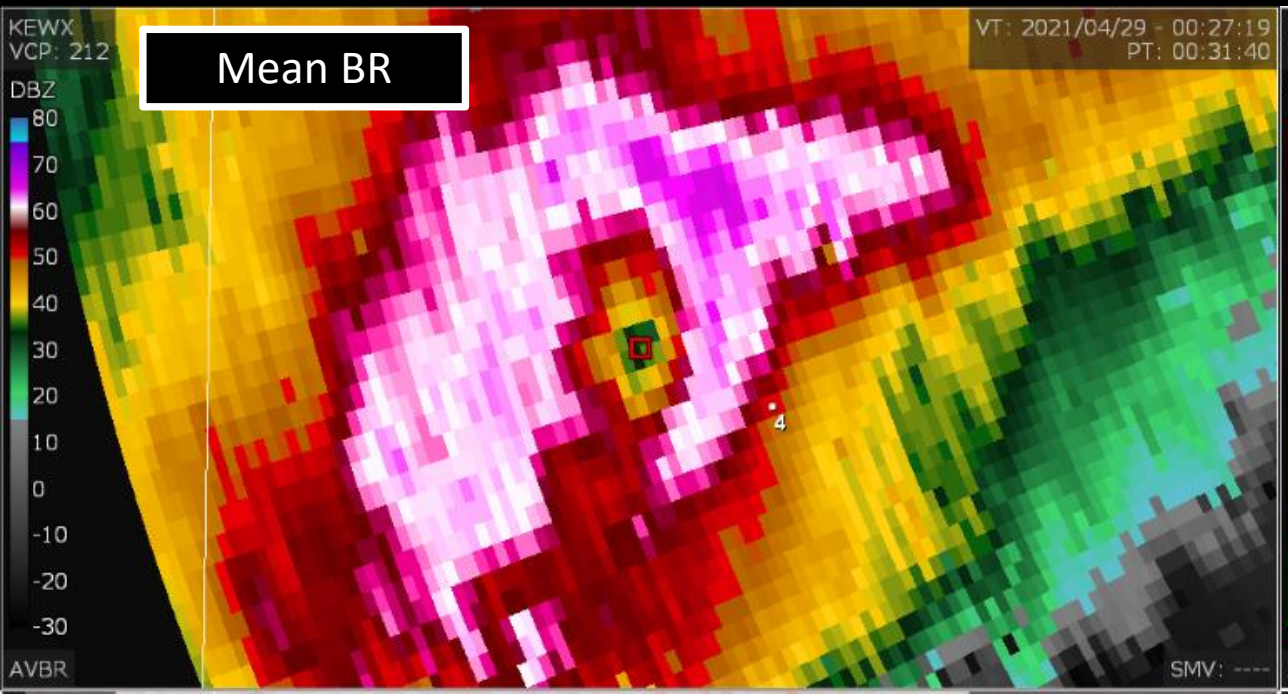
4.00
3.00
2.00
1.00
0.00
-1.00
-2.00
AVZD
SMV: ----


Mean BR
KEWX
VCP: 212
VT: 2021/04/29 - 00:27:19
PT: 00:31:40
DBZ
80
70
60
50
40
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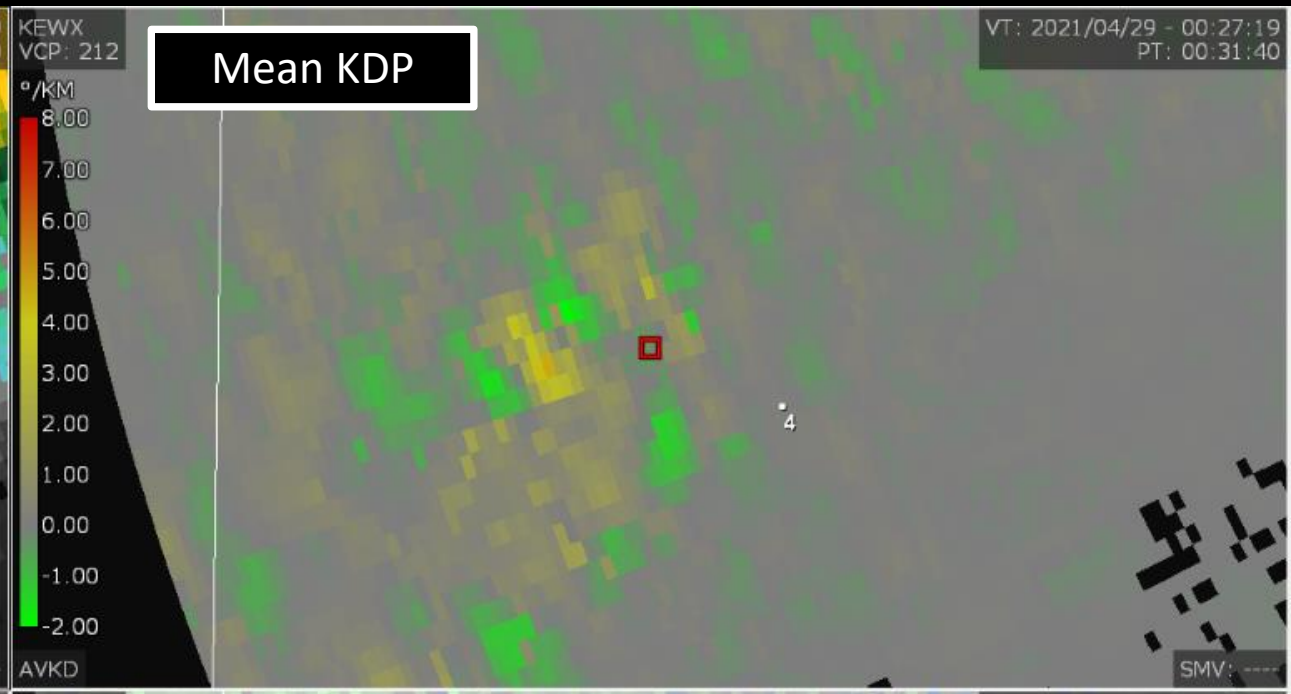
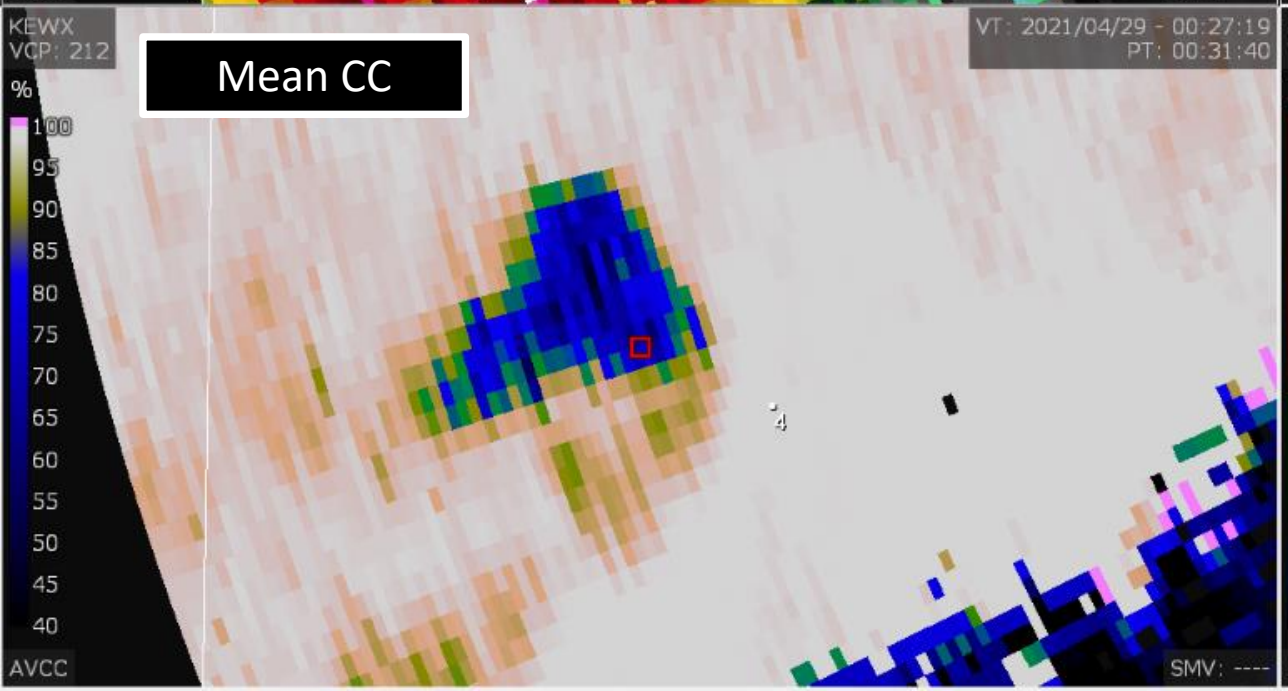
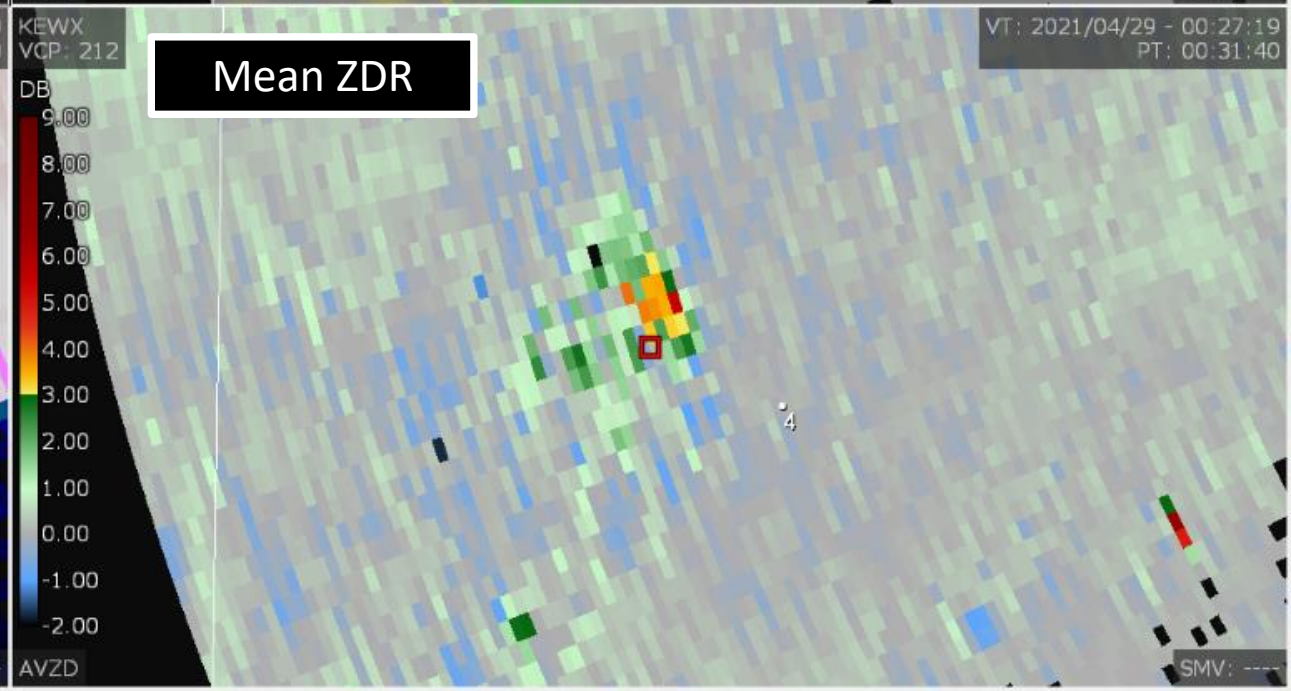
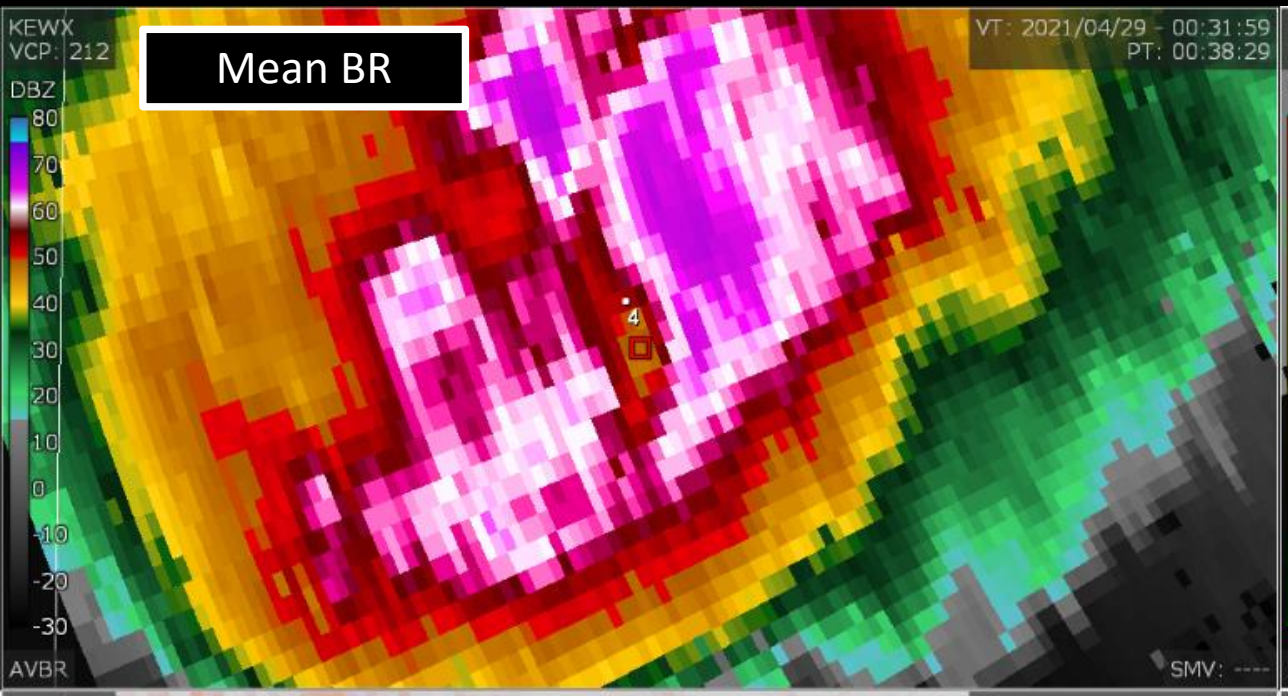
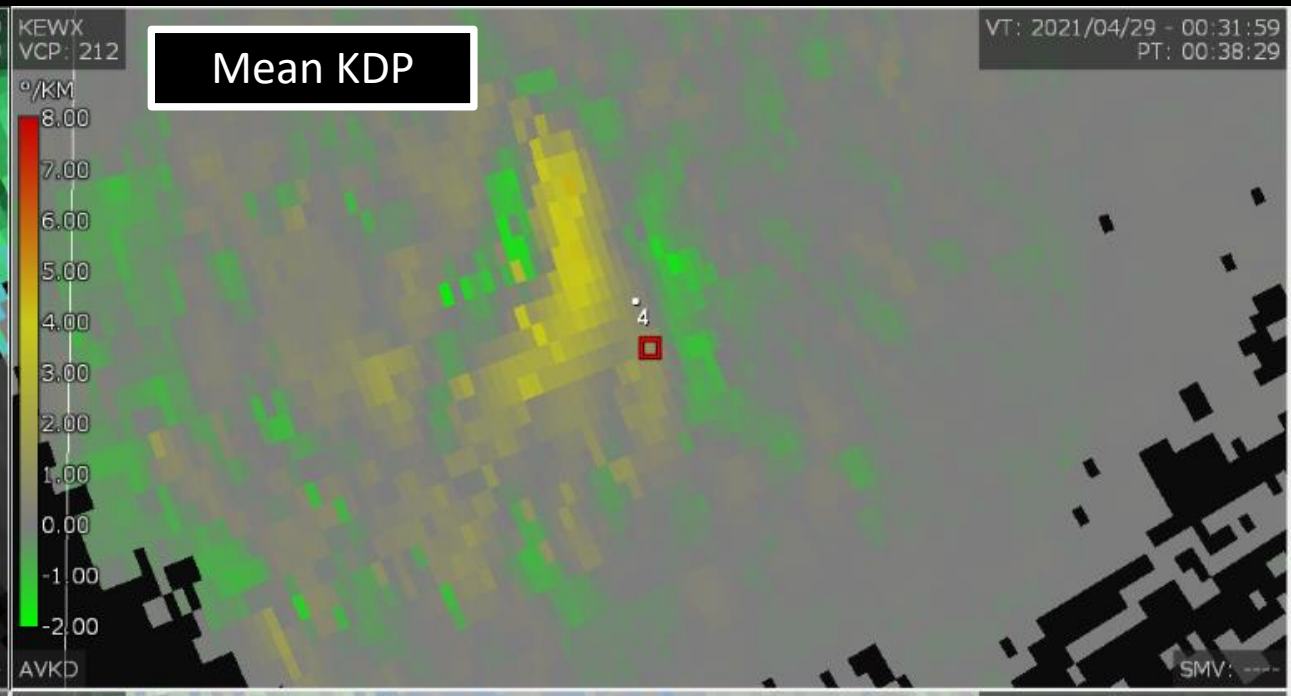
10
0
-10
-20
-30
AVBR
SMV: ----

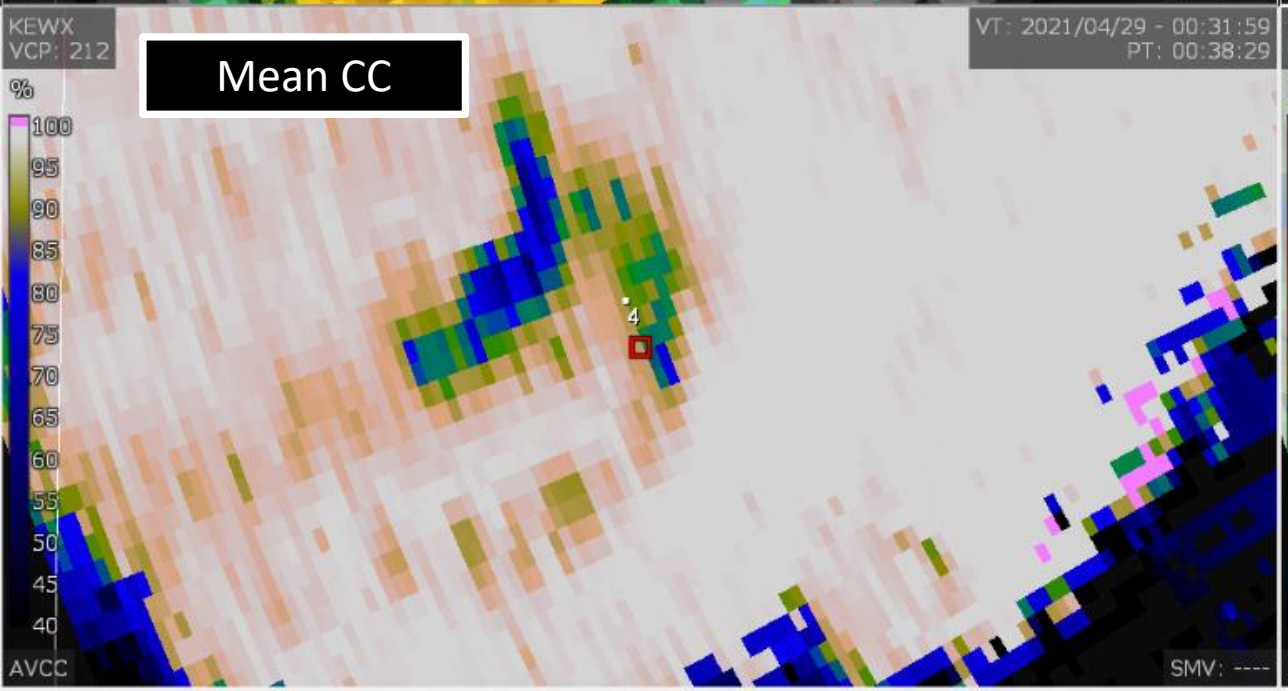

Mean KDP
KEWX
VCP: 212
VT: 2021/04/29 - 00:27:19
PT: 00:31:40
°/KM
8.00
7.00
6.00
5.00
4.00
3.00
2.00
1.00
0.00
-1.00
-2.00
AVKD
SMV: ----

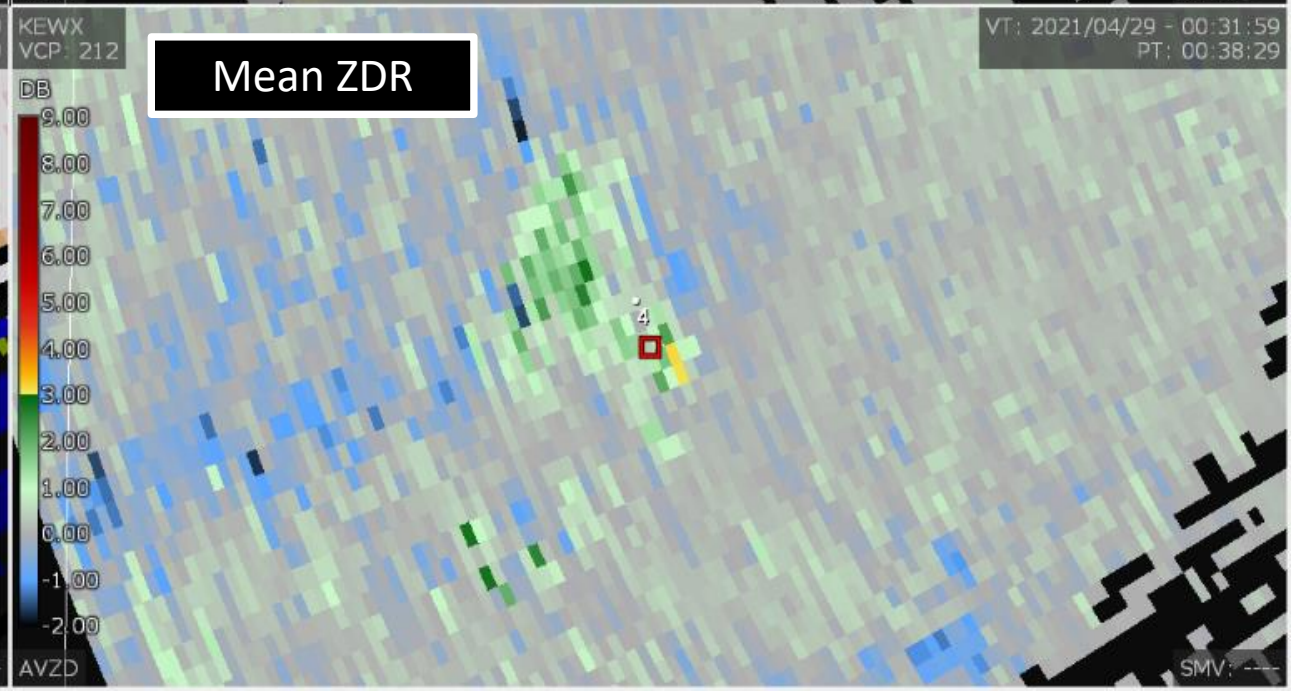

Mean CC
KEWX
VCP: 212
VT: 2021/04/29 - 00:27:19
PT: 00:31:40
%
100
95
90
85
80
75
70
65
60
55
50
45
40
AVCC
SMV: ----


Mean ZDR
KEWX
VCP: 212
VT: 2021/04/29 - 00:27:19
PT: 00:31:40
DB
9.00
8.00
7.00
6.00
5.00
4.00
3.00
2.00
1.00
0.00
-1.00
-2.00
AVZD
SMV: ----


Mean BR
KEWX
VCP: 212
VT: 2021/04/29 - 00:31:59
PT: 00:38:29
DBZ
80
70
60
50
40
30
20
10
0
-10
-20
-30
AVBR
SMV: ----


Mean KDP
KEWX
VCP: 212
VT: 2021/04/29 - 00:31:59
PT: 00:38:29
°/KM
8.00
7.00
6.00
5.00
4.00
3.00
2.00
1.00
0.00
-1.00
-2.00
AVKD
SMV: ----


Mean CC
KEWX
VCP: 212
VT: 2021/04/29 - 00:31:59
PT: 00:38:29
%
100
95
90
85
80
75
70
65
60
55
50
45
40
AVCC
SMV: ----


Mean ZDR
KEWX
VCP: 212
VT: 2021/04/29 - 00:31:59
PT: 00:38:29
DB
9.00
8.00
7.00
6.00
5.00
4.00
3.00
2.00
1.00
0.00
-1.00
-2.00
AVZD
SMV: ----