

MC3E NPOL Scanning

Five basic scan sequences are proposed, each for different objectives/scenarios

Waiting for precipitation

Scan 0 – 3 Low-level 360° PPIs; 10 minute repeat time

No aircraft, precipitation in range

Scan 1 – 5-6 minute 90° or 120° PPI volumes ('near' and 'far' modes based on precipitation echoes); include select RHI sweeps as appropriate

Aircraft, widespread precipitation

Scan 2 – 3 RHIs along same radial as D3R (~1 min)

Aircraft fly stacked legs along radial

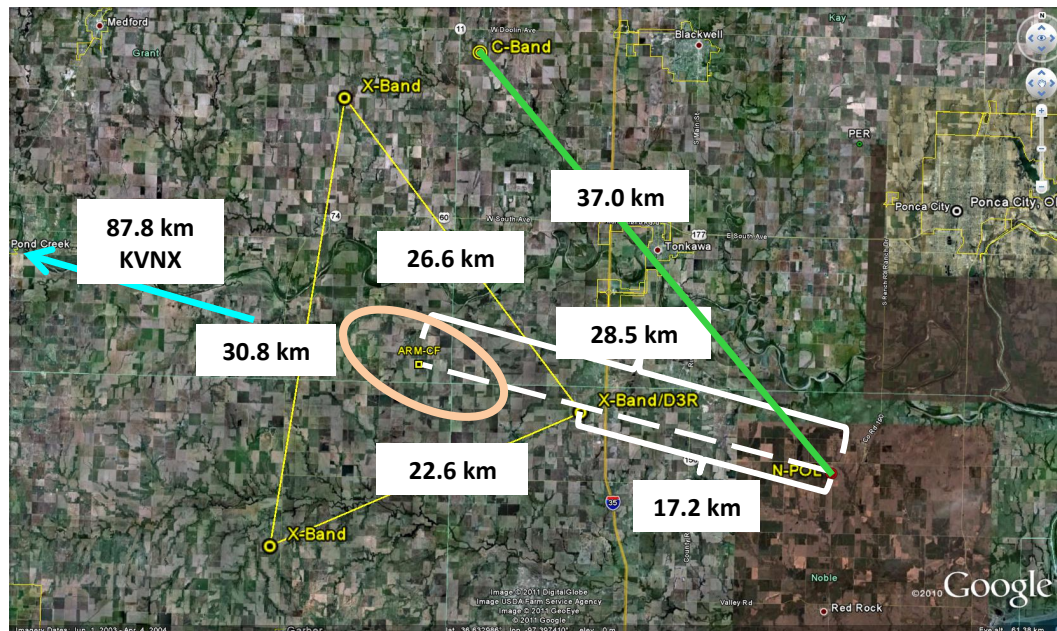
Aircraft, isolated precipitation

Scan 3 – 6 RHIs following aircraft (~2 min)

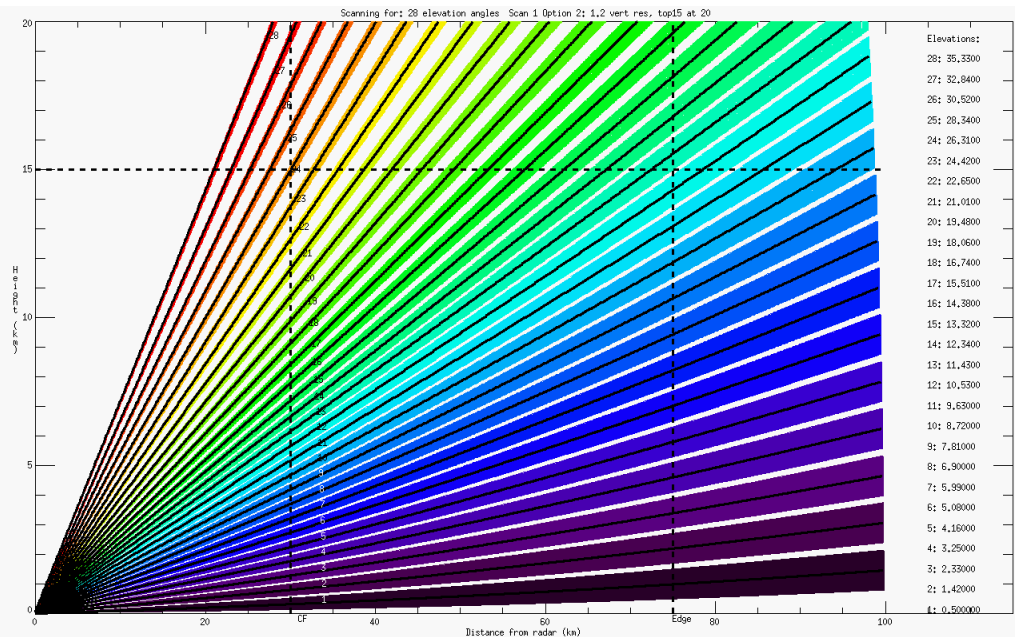
ER-2 overflies, Citation penetrates edges

Precipitation over gauge/disdrometer network - DSD variability

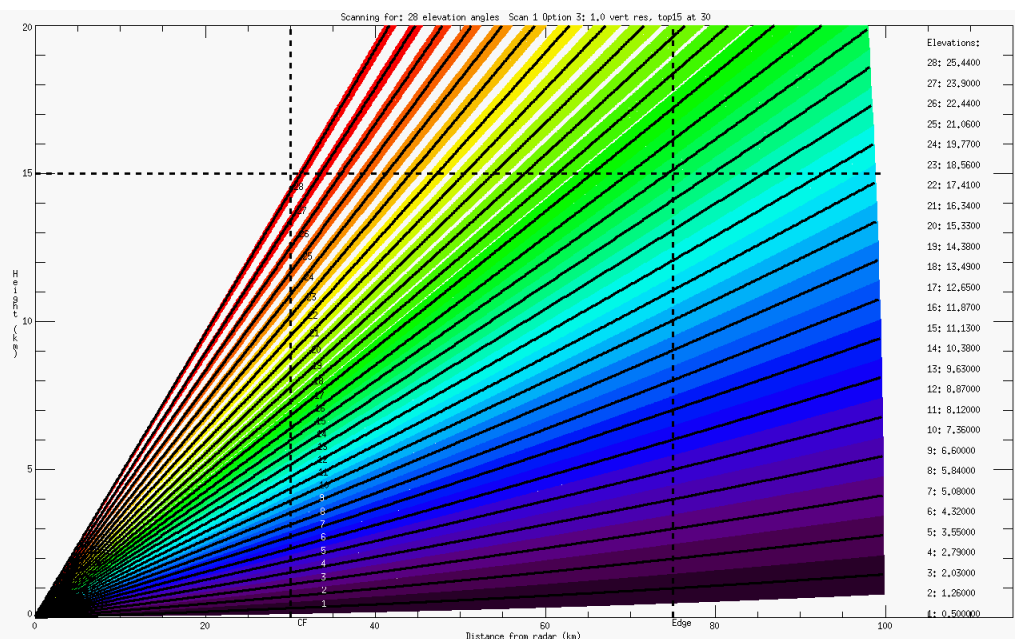
Scan 4 – 1 low-level PPI 90° sectors, 1 RHI sweep to 20°, alt H/V (~45 sec)



	SCAN 0	SCAN 1A	SCAN 1B	SCAN 2	SCAN 3	SCAN 4	
	"WAITING FOR PRECIP"	NO A/C, PRECIP, NEAR	NO A/C, PRECIP, FAR	A/C, WIDESPREAD PRECIP	A/C, ISOLATED PRECIP	DSD VARIABILITY	
Mode	STSR, PPI	STSR, PPI	STSR, PPI	STSR, RHI	STSR, RHI	ALT, PPI	ALT, RHI
Azimuthal scan rate	5° / sec	15° / sec	15° / sec	2° / sec	2° / sec	3.75° /sec	1.17°/sec
Azimuthal spacing	0.3°	0.9°	0.9°	0.12°	0.12°	0.9°	0.3°
Integrating pulses	60	60	60	60	60	128	128
PRF	1000 Hz	1000 Hz	1000 Hz	1000 Hz	1000 Hz	500 HZ	500 Hz
Max height of Interest (km)	3.5 km	15 km	15 km	_____	_____	_____	_____
Sector Size	360°	90° / 120°	90° /120°	3 azimuthal angles	6 azimuthal angles	90°	_____
Minimum range for topping (km)	50 km	20 km	30 km	_____	_____	_____	_____
"Back Wall" range (km)	100.0 km	75 km	75 km	_____	_____	_____	_____
Vertical resolution at "back wall"	1.0 km	1.2	1.0	_____	_____	_____	_____
Number of Angles	3 (0.5°, 1.0,° 1.5°)	28 / 27	28 / 27	40	40	1	20
Highest Elevation angle	1.5°	35.3°, 32.8°	25.4° / 23.9°	40°	40°	0.5° -TBD	20°
Time	3:40	5:18 / 6:00	5:18 / 6:00	~1:00	~2:00	0:25	0:17
Notes	•Repeat every 10 minutes?	•Modified based on echoes (remove upper angles, etc.); Add RHIs when time	•Modified based on echoes (remove upper angles, etc.); Add RHIs when time	•Possibly change max of highest elevation angle; ideally over A/C track along radial of D3R	•Azimuths modified to follow aircraft track	Total time: 0:42	
Exact angles	•0.5°, 1.0°, and 1.5°	0.5 1.42 2.33 3.25 4.16 5.08 5.99 6.90 7.81 8.72 9.63 10.53 11.43 12.34 13.32 14.38 15.51 16.74 18.06 19.48 21.01 22.65 24.42 26.31 28.34 30.52 32.84 (35.33)	0.5 1.26 2.03 2.79 3.55 4.32 5.08 5.84 6.60 7.36 8.12 8.87 9.63 10.38 11.13 11.87 12.65 13.49 14.38 15.33 16.34 17.41 18.56 19.77 21.06 22.44 23.90 (25.44)	RHIs determined by Aircraft legs. Center RHI on A/C radial, other 2 on either side	RHIs determined by Aircraft legs. Center RHI on A/C radial, other 2 on either side	• Elevation angle for PPI will be determined in the field --Bringi wanted to look at RHIs to see how "low" we can go. RHI will be over the profiler. Main focus of this scan is high temporal sampling of spatial correlation.	



Scan 1A Elevation Series



Scan 1B Elevation Series