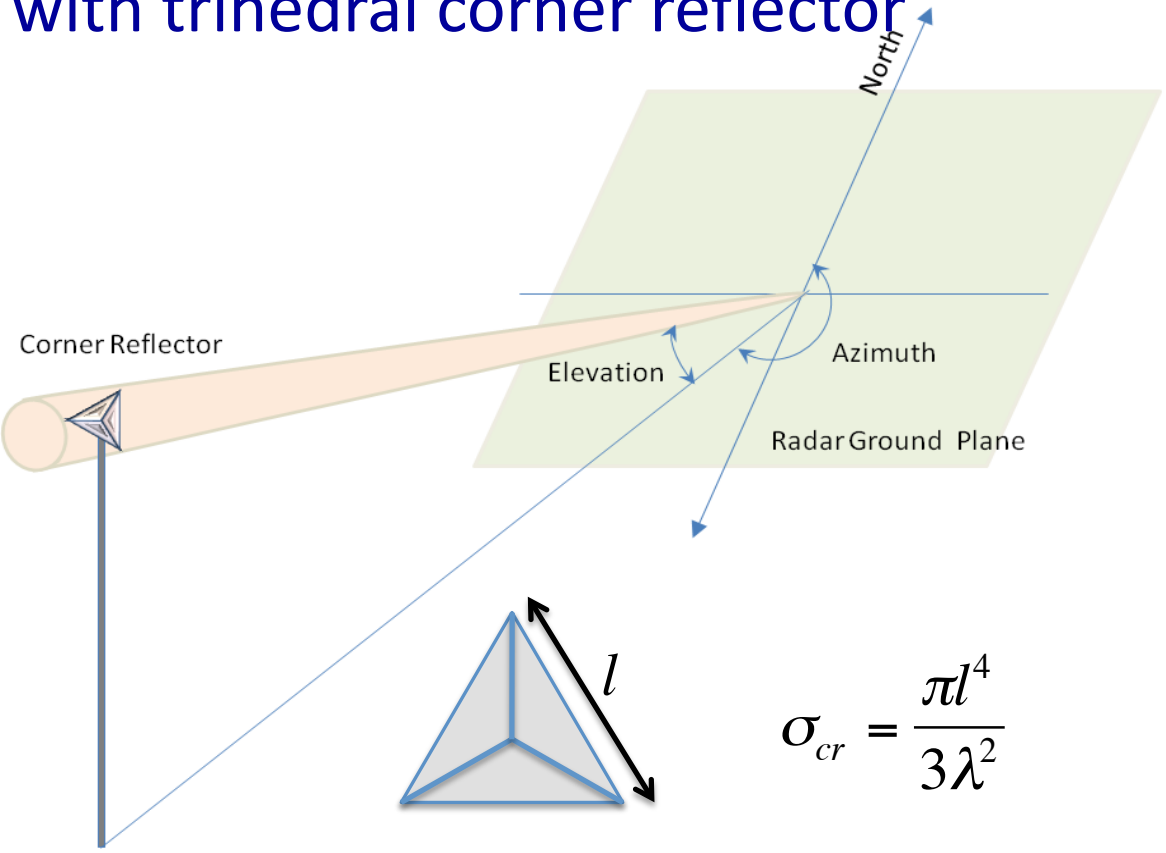
StormVEx:
Status of SWACR calibration

Calibration with trihedral corner reflector

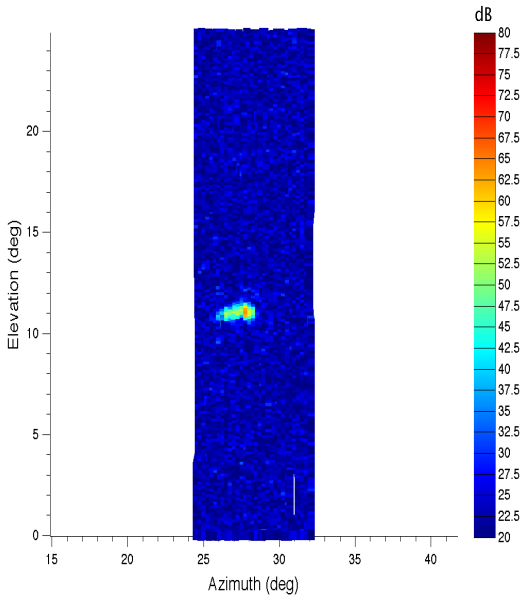


$$\sigma_{cr} = \frac{\pi l^4}{3\lambda^2}$$

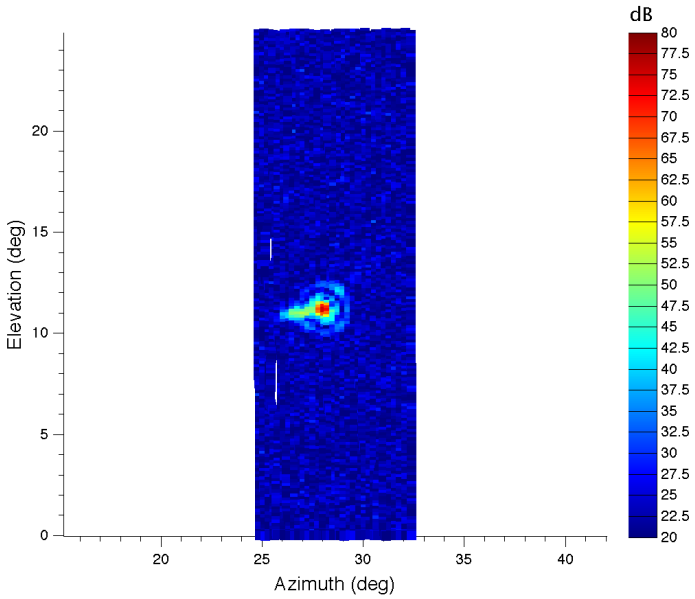
$$C_{cr} = \frac{10^{18}}{\pi^5 |K_w|^2} \left(\frac{2}{c\tau}\right) \frac{8\ln 2}{\pi\phi\theta} \frac{\sigma_{cr}}{R^4} \lambda^4 \frac{1}{p_{cr}}$$

$$Z_h[dBz] = P_r[dBu] + C_{cr}[dB] + 20\log_{10} R[m]$$

Corner reflector at Storm Peak Lab



Without CRc



With CR

$$R = 2.4629 \text{ km}$$

$$C_{cr} = \frac{10^{18}}{\pi^5 |K_w|^2} \left(\frac{2}{c\tau}\right) \frac{8 \ln 2}{\pi \phi \theta} \frac{\sigma_{cr}}{R^4} \lambda^4 \frac{1}{p_{cr}} = -96.02 dB$$

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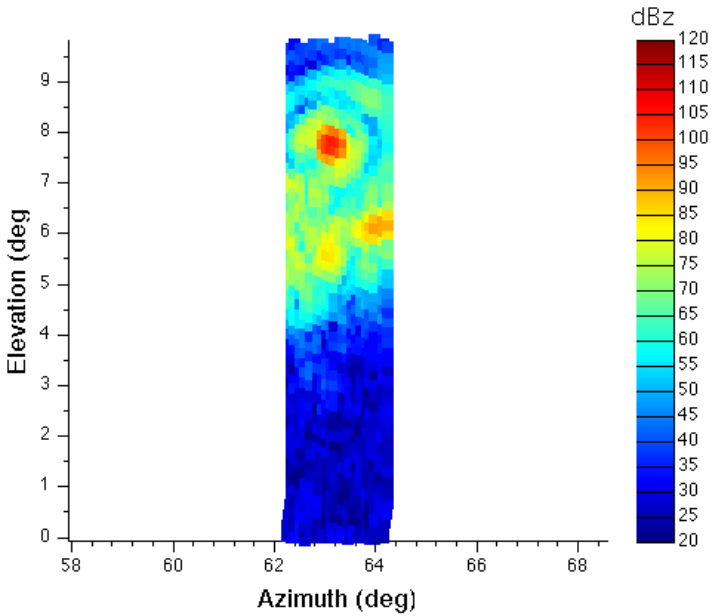
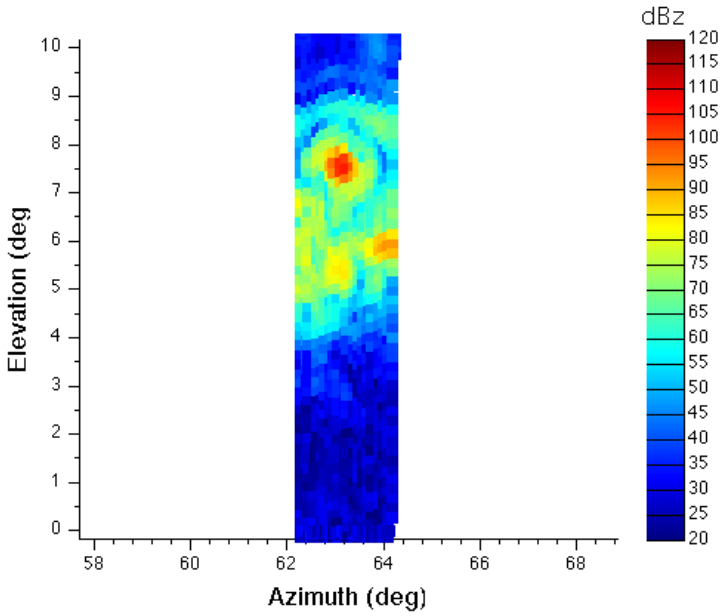
Corner reflector at Burgess Creek



Scanning up



Scanning down

$$R = 450 \text{ m}$$

$$C_{cr} = \frac{10^{18}}{\pi^5 |K_w|^2} \left(\frac{2}{c\tau}\right) \frac{8\ln 2}{\pi\phi\theta} \frac{\sigma_{cr}}{R^4} \lambda^4 \frac{1}{p_{cr}} = -93.89 dB$$

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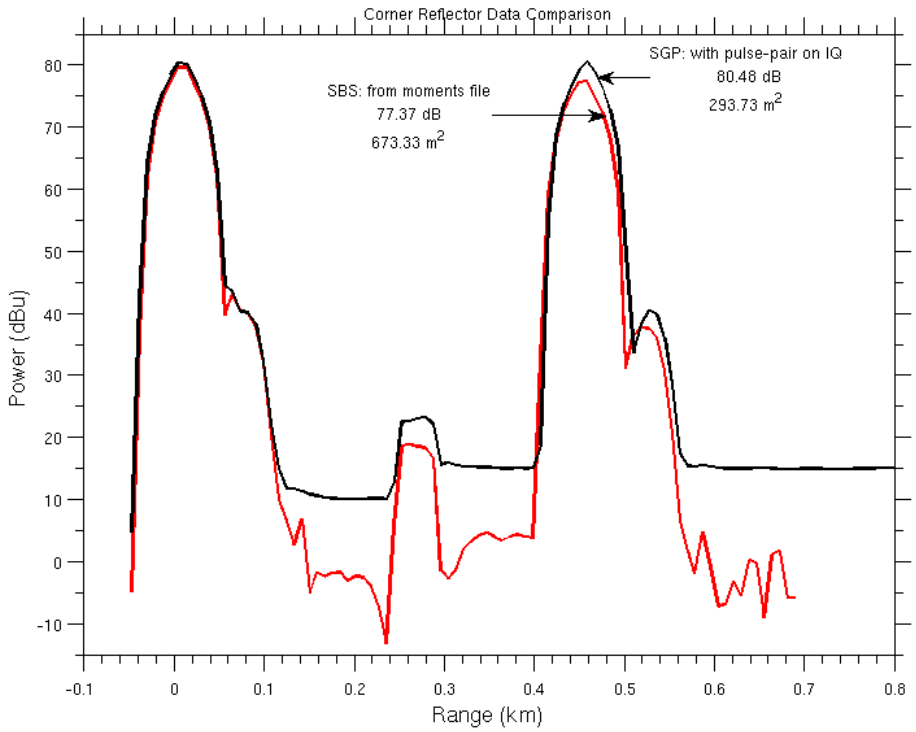
Comparison with SGP



CR location	Radar constant
SGP	-100.4
Storm Peak Lab	-96.1
Burgess Creek	-93.9

Further analysis and plan

- Possible explanations
  - Drop in transmit power (not in our case)
  - Antenna (not in our case)
  - Multi-path effect
  - Relative position of corner reflector
  - Combination of Multi-path and corner reflector position (most likely)
- short term plan
  - Continue corner reflector at Burgess Creek
  - Transmit power measurement (have a meeting with Prosensing)
- After the campaign
  - Move SWACR to PNNL
  - PNNL has trailer and corner reflector tower to run calibrations