RADAR QUALITY CONTROL

ARM DATA QUALITY OFFICE

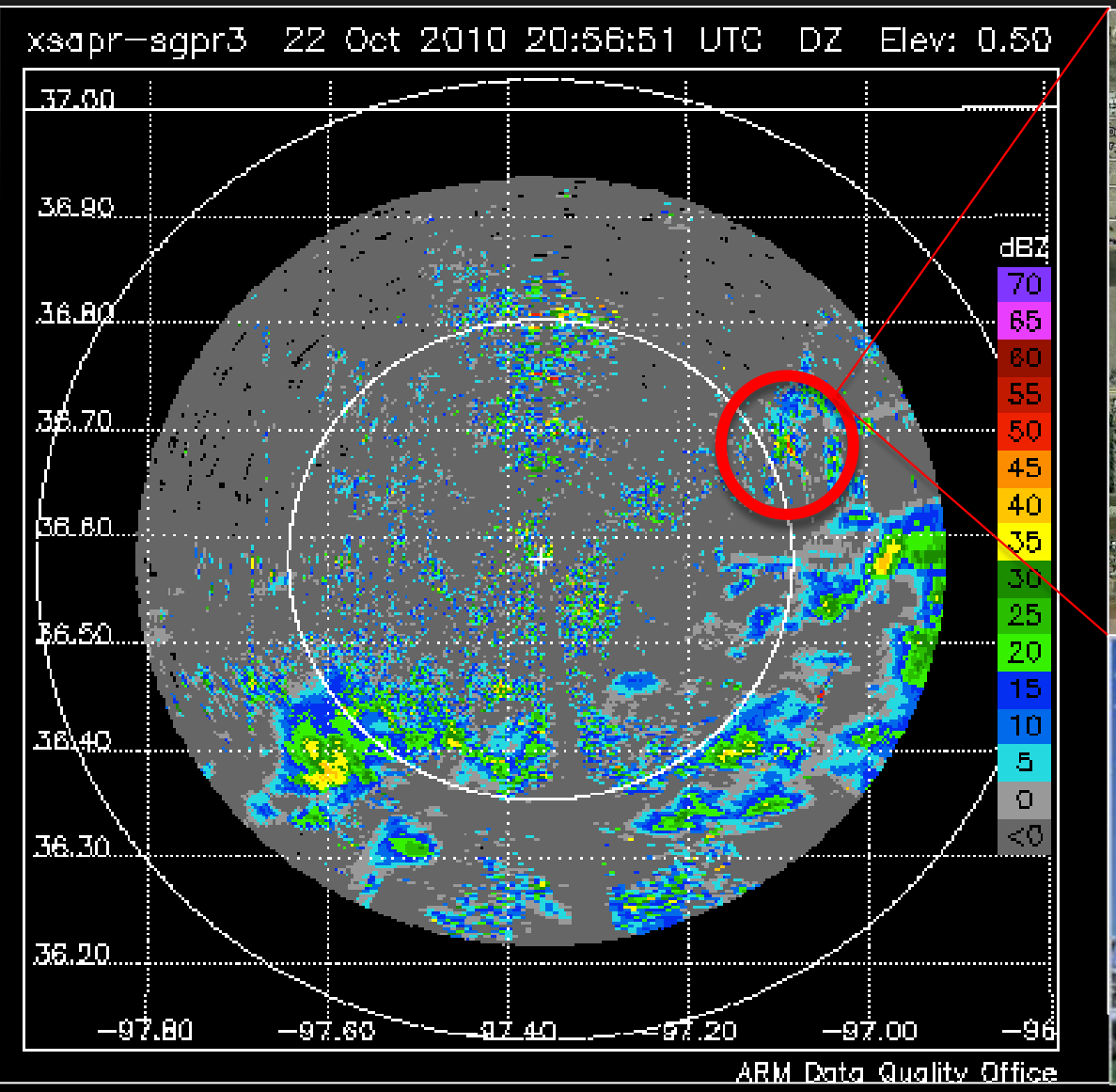
ACKNOWLEDGEMENTS

- Collaborators on QC
  - Scott Giangrande – Brookhaven National Lab
  - Scott Collis – Argonne National Lab
- Radar Mentors
  - Kevin Widener and Nitin Bharadwaj - Pacific Northwest National Lab
- DQ Office
  - Randy Peppler, Ken Kehoe, and Justin Monroe – University of Oklahoma, CIMMS
  - Sean Moore – Alliant Techsystems Mission Research

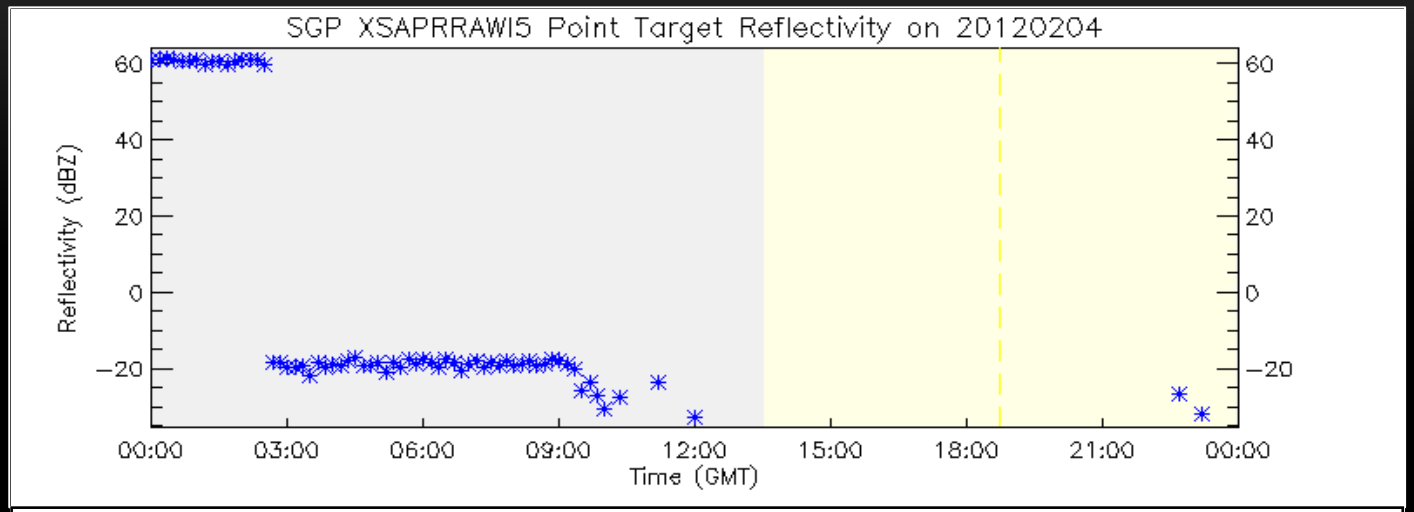
BACKGROUND

- Averaging 5 minutes/scan
- 288 files/day
- 6 SAPRs – SGP (4), TWP (1), NSA (1)
- Average of 1728 files per day
- 1152 of which would ideally be near real time
  - NSA and TWP will be batch processing
- Analyzing each file would require a lot of work
- QC Processing
  - Automated methods and tests
  - Extracting subsets of radar data to inspect

POINT TARGETS

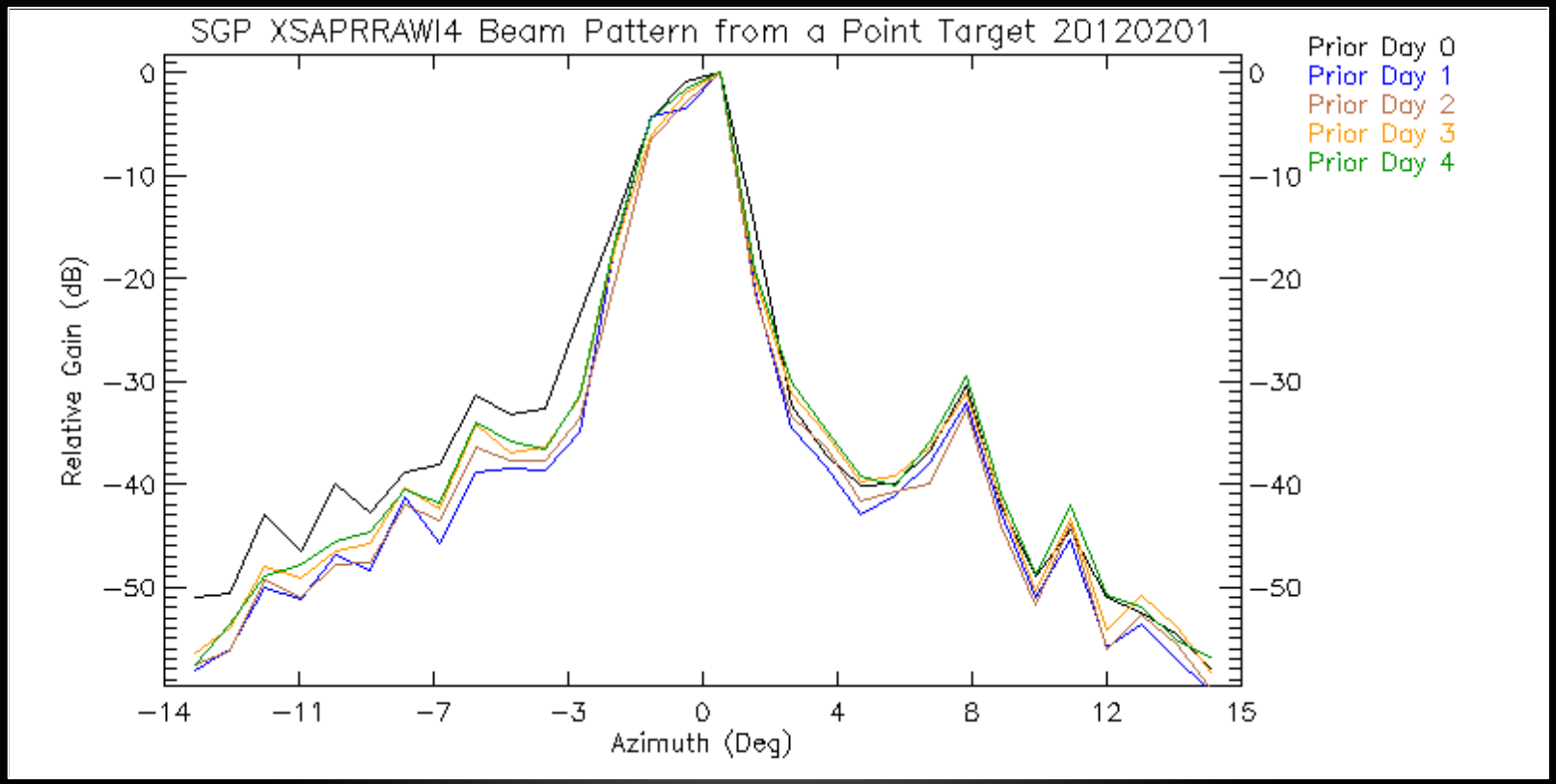


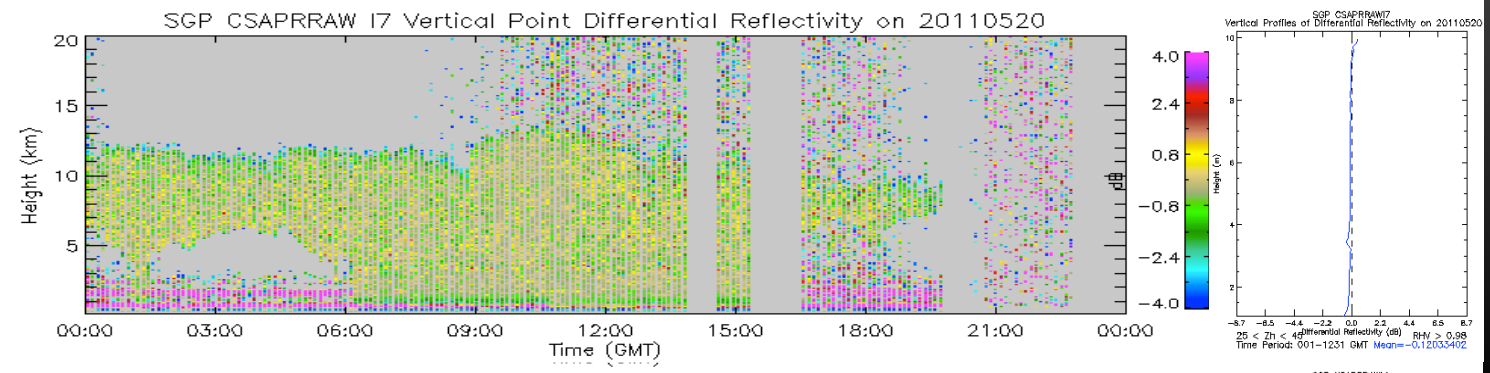
POINT TARGET

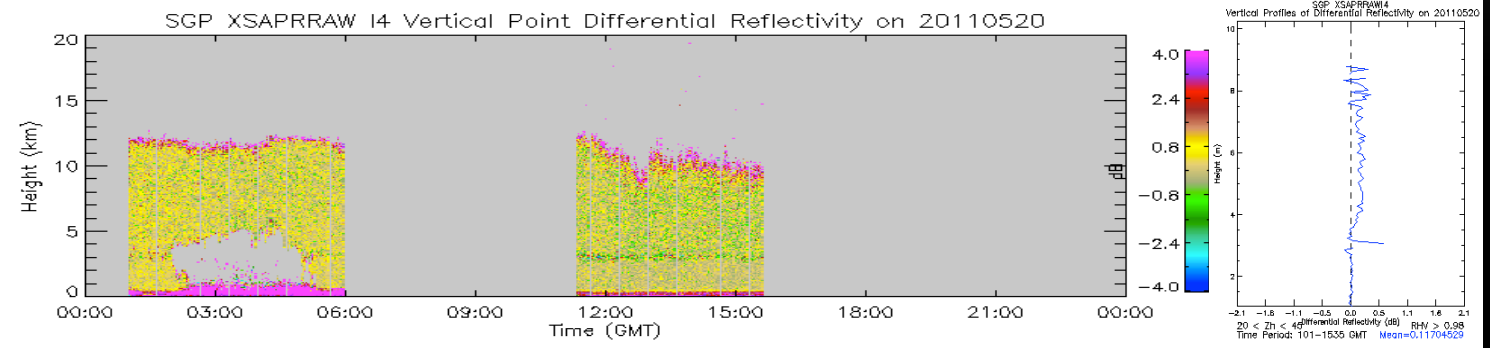


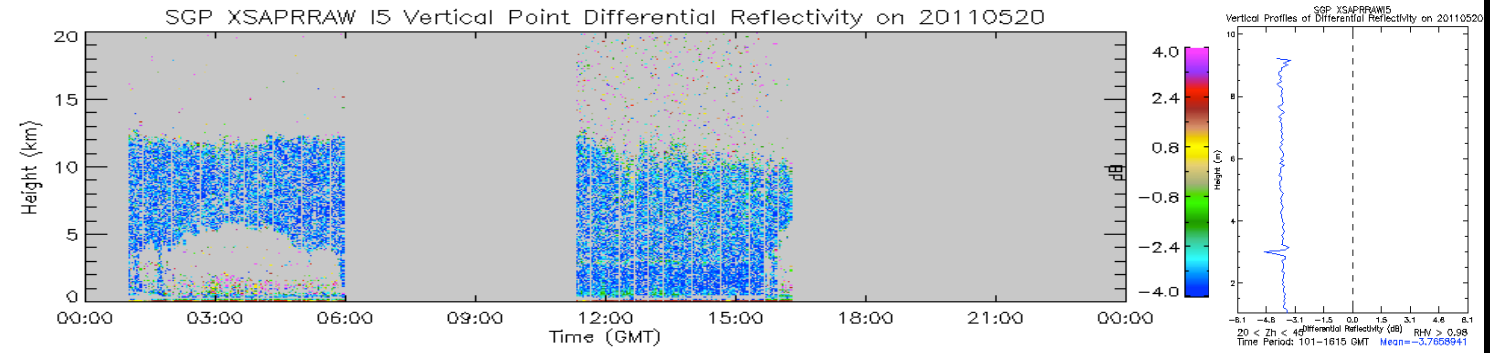
POINT TARGET

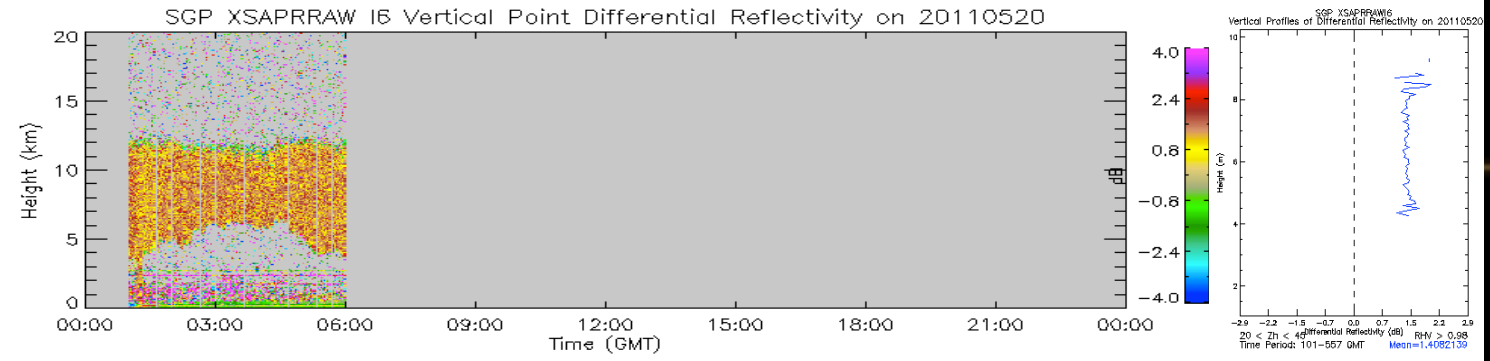
- Since we already have a point target, getting a rough beam pattern was fairly simple











cimms

CSAPR

$25 < Z_H < 45$ dBZ

$\rho_{HV} > 0.98$

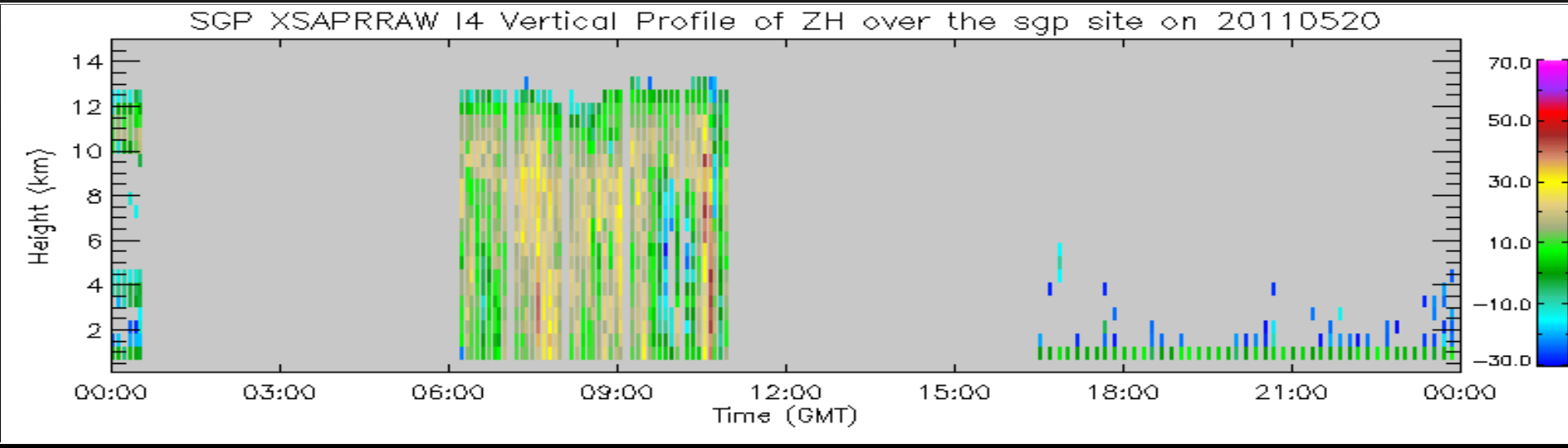
VERTICAL Z_{DR} PROFILES

XSAPR

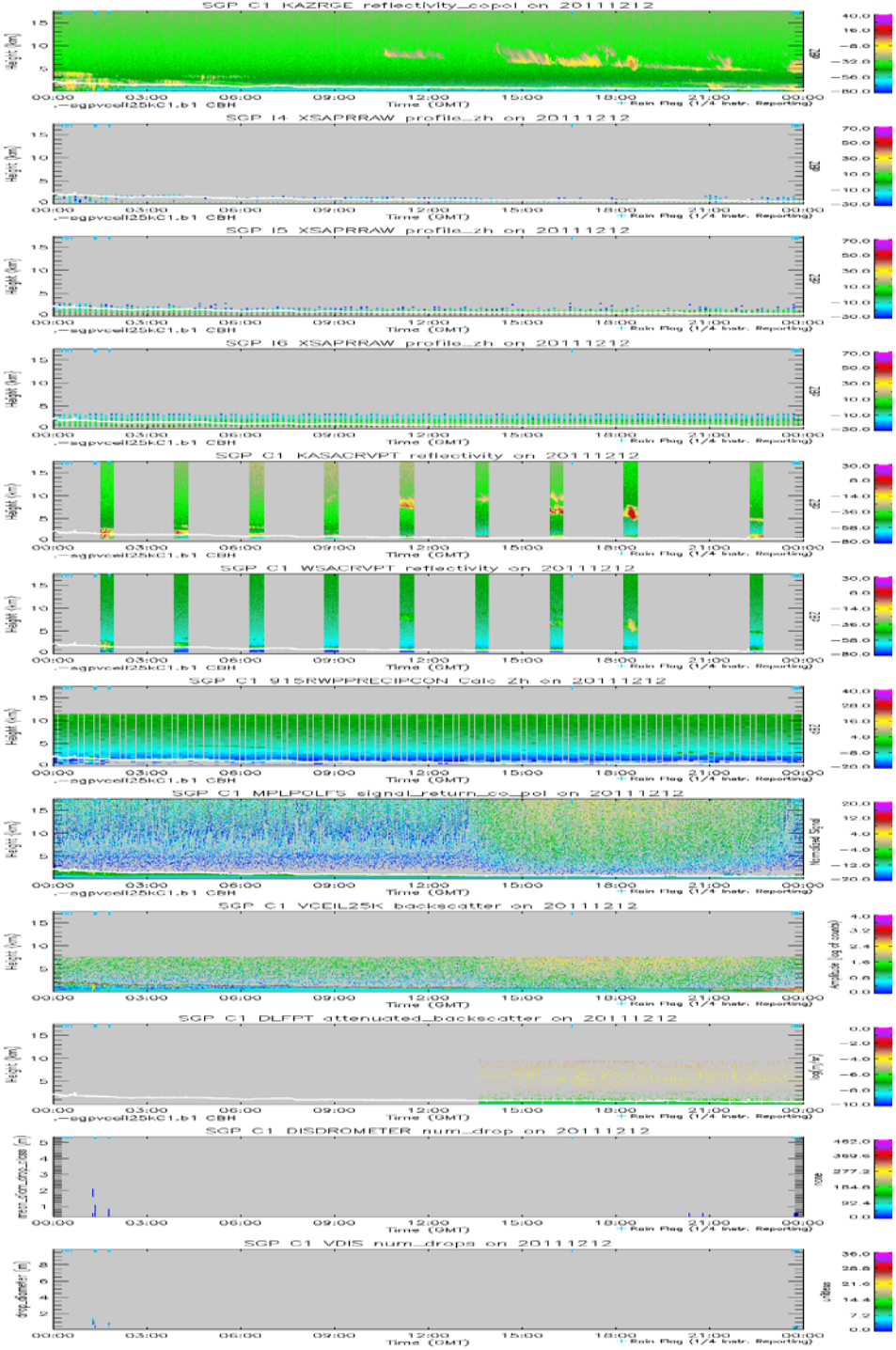
$20 < Z_H < 40$ dBZ

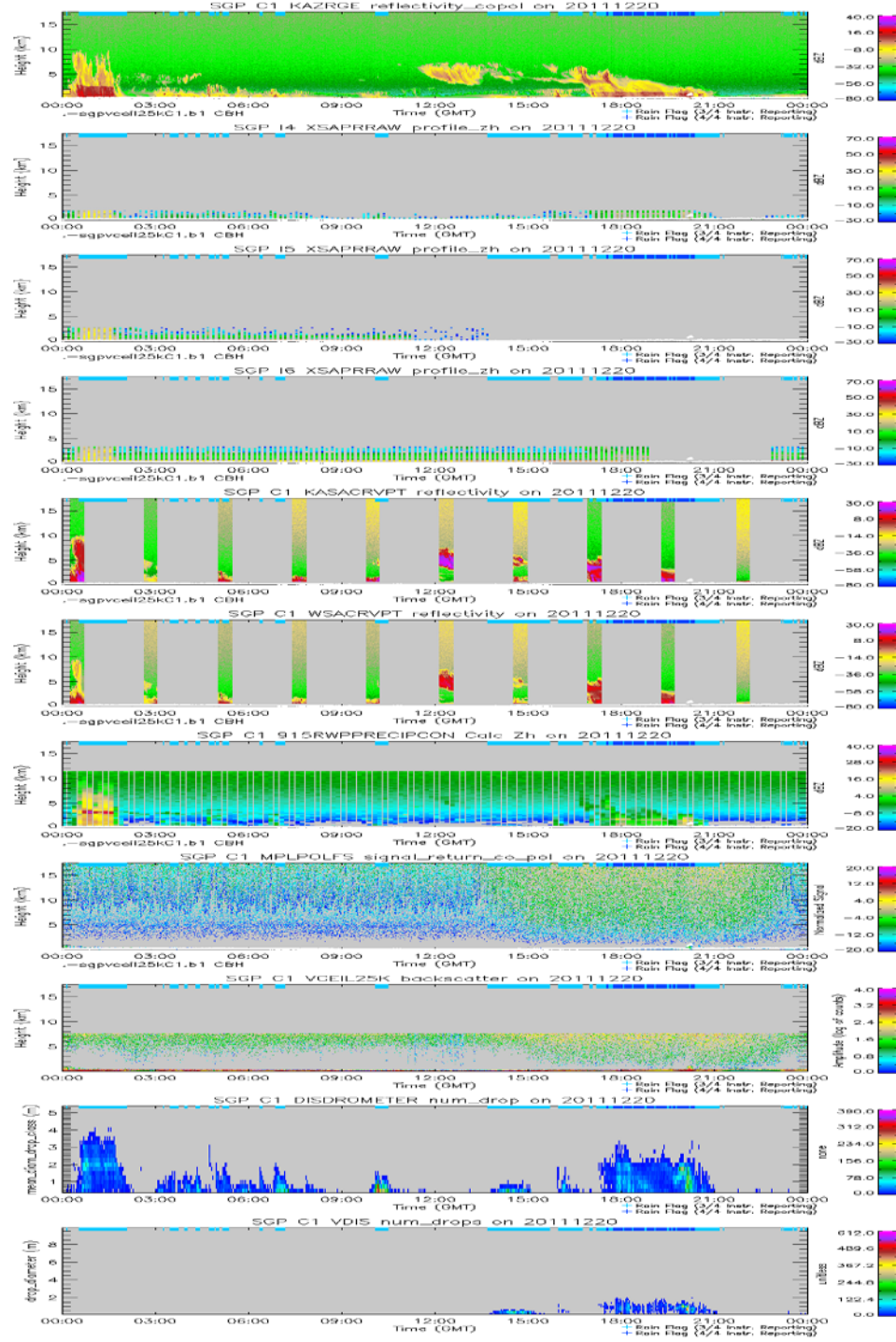
$\rho_{HV} > 0.98$

PROFILES OVER CF'S



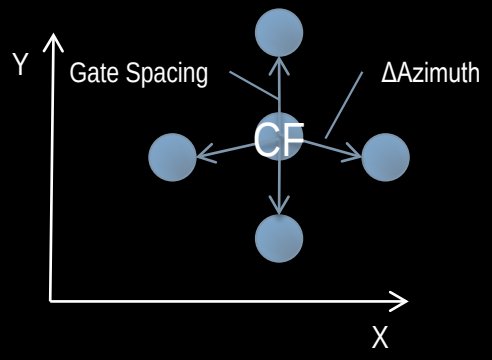
- Profiles extracted over the central facilities (CF) are compared with vertically pointing instruments at the CF (lidar, kazr, etc..) or with surface based precipitation measurement systems (met, disdrometer, rain, vdis)

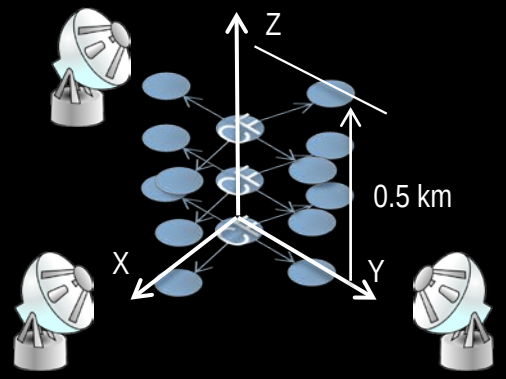

SGP C1 KAZRGE reflectivity_copol on 20111212
SGP I4 XSAPRRAW profile_zh on 20111212
SGP I5 XSAPRRAW profile_zh on 20111212
SGP I6 XSAPRRAW profile_zh on 20111212
SGP C1 KASACRVPT reflectivity on 20111212
SGP C1 WSACRVPT reflectivity on 20111212
SGP C1 915RWPPRECIPCON Calc Zh on 20111212
SGP C1 MPLPOLFS signal_return_co_pol on 20111212
SGP C1 VCEIL25K backscatter on 20111212
SGP C1 DLFPT attenuated_backscatter on 20111212
SGP C1 DISDROMETER num_drop on 20111212
SGP C1 VDIS num_drops on 20111212
Height (km)
Time (GMT)
dBZ
Rain Flag (1/4 Instr. Reporting)


SGP C1 KAZRGE reflectivity_copol on 20111220
SGP I4 XSAPRRAW profile_zh on 20111220
SGP I5 XSAPRRAW profile_zh on 20111220
SGP I6 XSAPRRAW profile_zh on 20111220
SGP C1 KASACRVPT reflectivity on 20111220
SGP C1 WSACRVPT reflectivity on 20111220
SGP C1 915RWPPRECIPCON Calc Zh on 20111220
SGP C1 MPLPOLFS signal_return_co_pol on 20111220
SGP C1 VCEIL25K backscatter on 20111220
SGP C1 DISDROMETER num_drop on 20111220
SGP C1 VDIS num_drops on 20111220
Height (km)
Time (GMT)
dBZ
Rain Flag (3/4 Instr. Reporting)
Rain Flag (4/4 Instr. Reporting)

PROFILES OVER CF'S

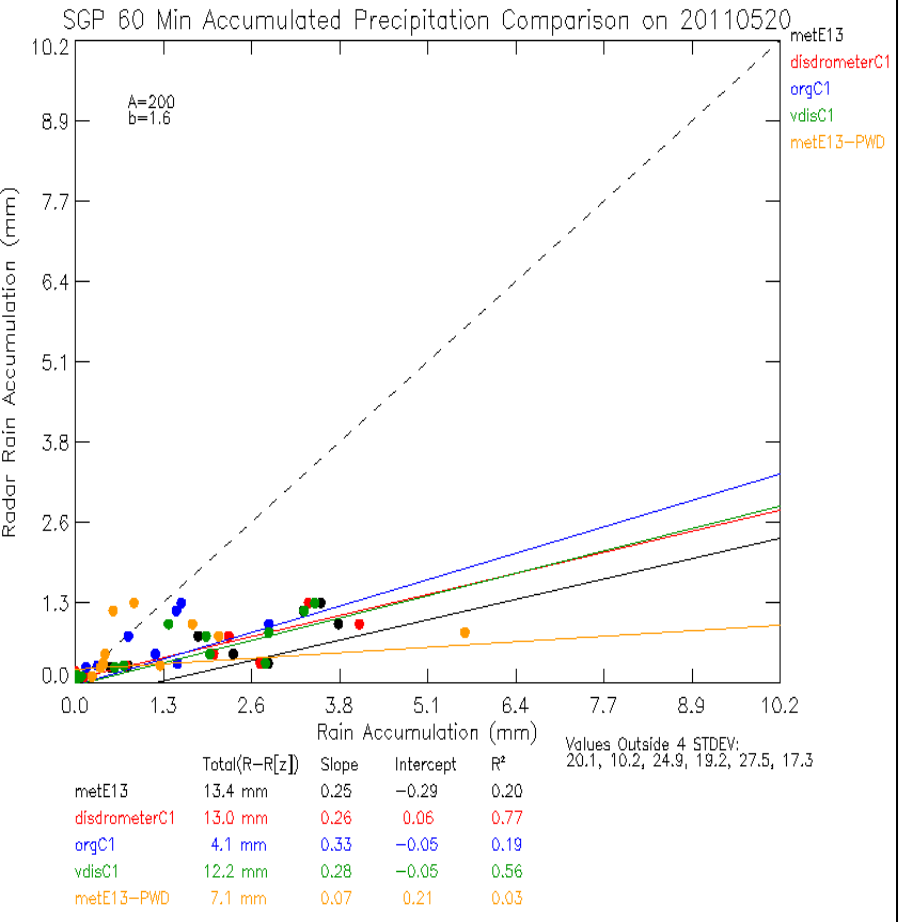
- Comparisons with surface precipitation instruments
  - Data from profiles are used to calculate an average reflectivity over the CF
    - Data below 0.5 km from 5 different points are averaged out into one value for comparison with the surface instruments

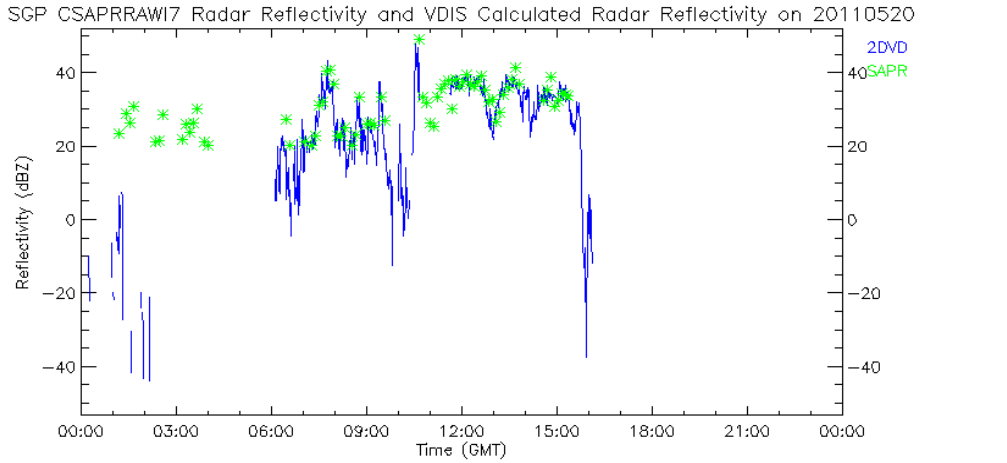


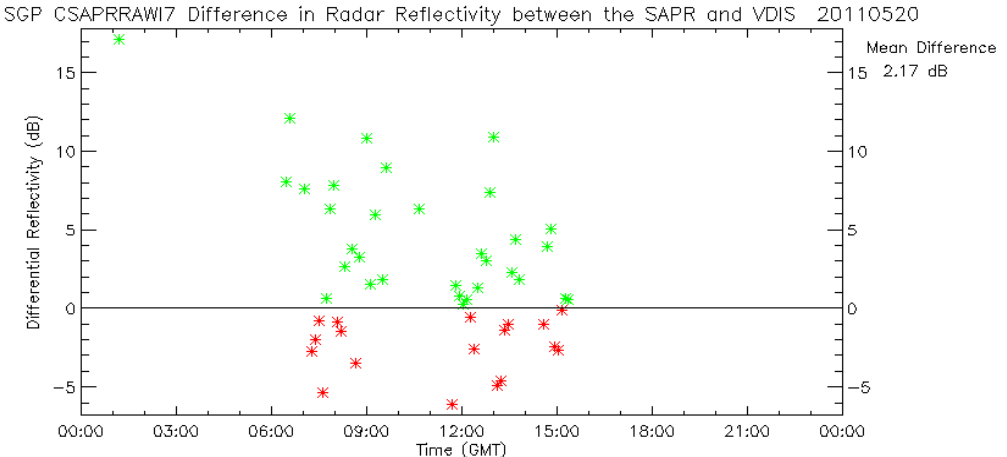


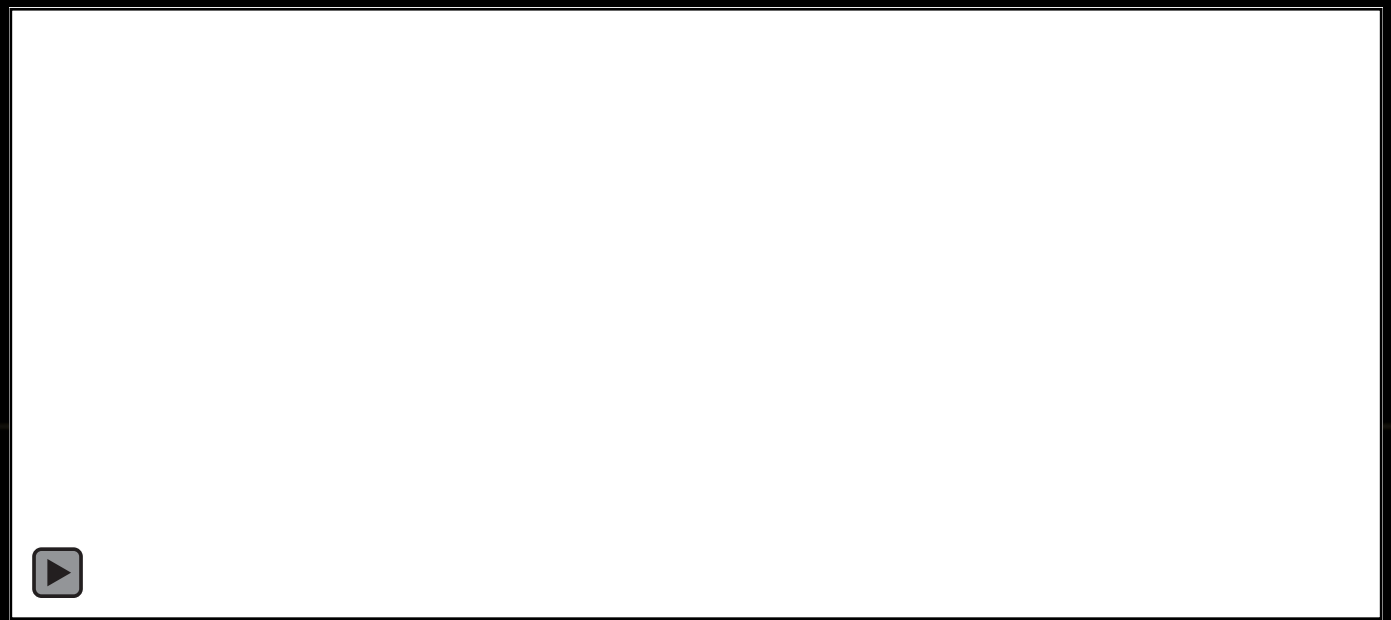
PROFILES OVER CF'S

- Currently we are using 60 minute accumulations
  - Marshall-Palmer Relation: A=200, b=1.6
- Reflectivity comparison with 2D video disdrometer







DISCUSSION

- What can we do better?
- What can we add to this analysis?
- What does not make any sense?
- Should we continue looking at raw files when CF-Radial becomes available?
  - Pro: We have all the processing set up for RAW files
  - Con: We won't catch any errors in the ingest