Description of the work

McGill

- Analysis of three Cartesian wind components (**U**,**V**,**W**) using multiple Doppler radar observations.

- Principle investigators: Kirk North, Scott Collis, and Pavlos Kollias.

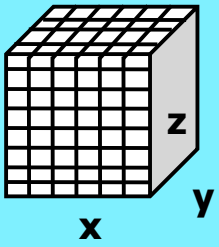
- Methodology following work by Ray et al. (1980), Protat and Zawadzki (1999), Gao et al. (1999), Shapiro et al. (2009), Potvin et al. (2012), among others.

- Data product has been staged on the ARM archive as an *evaluation* product, for cases from MC3E, a convective cloud life cycle experiment which took place in Oklahoma during April-June 2011.

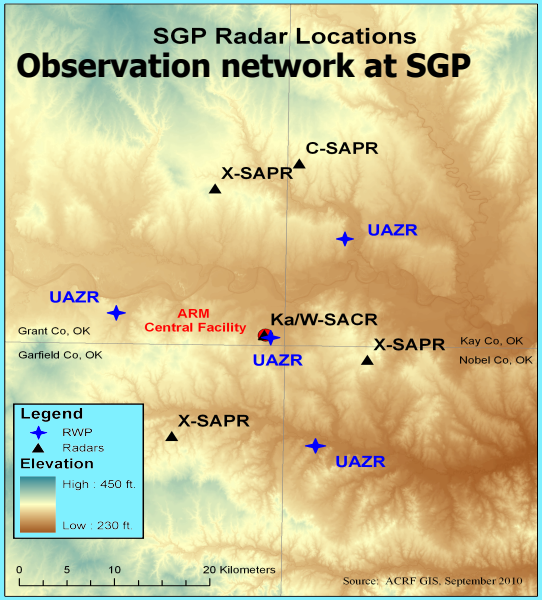
- Product contains analyses of vertical velocity in deep convective clouds, allowing for statistical evaluations of **W** in deep convective clouds and the corresponding aerosol impacts.

ConVV – Convective Vertical Velocity VAP

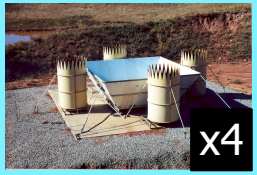
Current model settings:
- 100 x 100 x 100 km domain centered at SGP CF.
- 500 m res in (**x,y,z**).



Scanning radars



Profiling radars



Profiling radars provide a source for validation of scanning radar analyses.

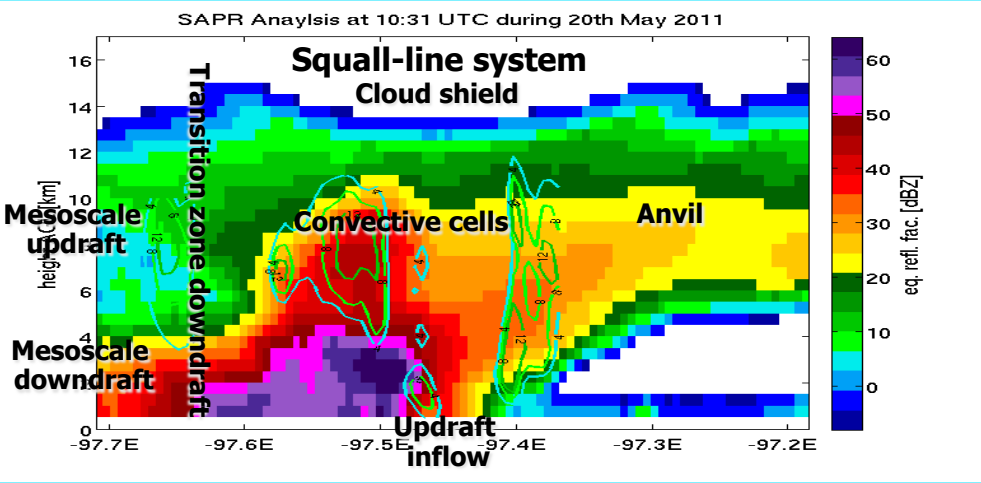
Analyses currently available on the ARM archive:

1. 25th April 2011 (8-11 UTC)
2. 20th May 2011 (6-11 UTC)
3. 23rd May 2011 (21-23 UTC)

} MC3E

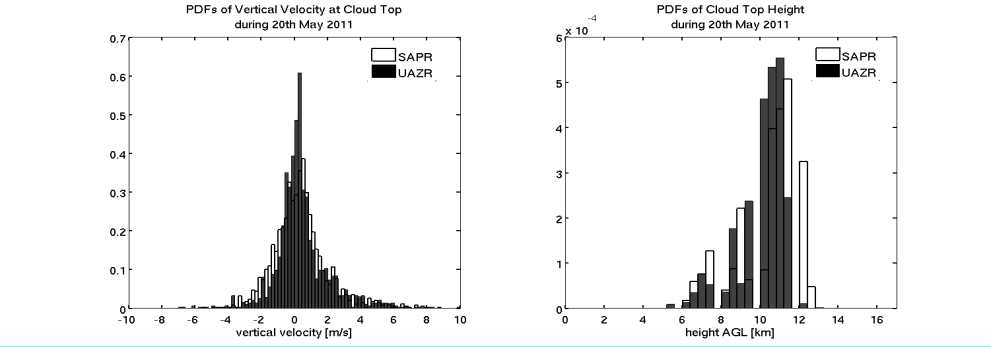
North, K. W., S. Collis, S. E. Giangrande, and P. Kollias, 2013: Vertical Velocity Retrievals in Convective Clouds using the ARM Heterogeneous Radar Network at SGP during MC3E. Unpublished manuscript.

http://iop.archive.arm.gov/arm-iop/0eval-data/north/convv/ (ARM archive)

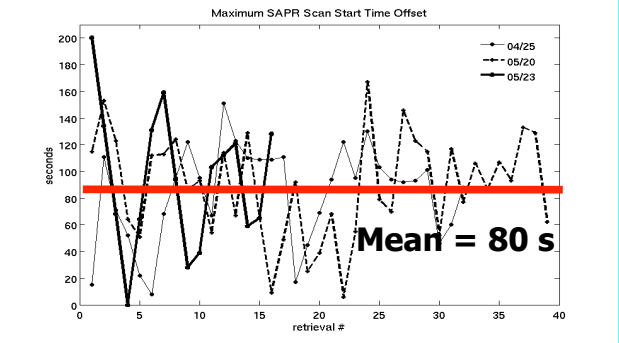


Updraft contours at 4, 8, 12 m/s

- Qualitatively consistent analysis for a squall-line system (Biggerstaff and Houze, 1993).



- Cloud top statistics from both SAPR and UAZR analyses show good agreement.



On-going work

- Non-simultaneity of observations needs to be addressed (Gal-Chen, 1982)

Recent findings from TWP-ICE

Scott Collis

TWP-ICE took place in and around Darwin, Australia.

Vertical velocities in a subset of cases were retrieved using both dual-Doppler radars and dual frequency profilers. Recent work (Collis et al 2013) has shown the two techniques show good agreement.

However multi-day reconstructions of statistical updraft profiles disagree with those of (Wu et al, 2009) drawing into question the validity of the vertical velocity spectrum in tropical convection.