Description of the work

- 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).

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)

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.