Lidar and profiling use in LASSO*

*Lidarmes ARM Symbiotic Simulation and Observation Workflow

Andrew Vogelmann¹, William Gustafson², Tami Toto¹, Zhijin Li³,⁴, Xiaoping Cheng⁵, Satoshi Endo¹, Jinwon Kim³, Bhargavi Krishna⁶, & Heng Xiao²

¹BNL, ²PNNL, ³UCLA, ⁴JPL, ⁵Nanjing U., ⁶ORNL

LASSO Webpage: https://www.arm.gov/capabilities/modeling

LASSO e-mail list sign up: http://eepurl.com/bCS8sS
Alpha 1 data release in June 2016

- Initialization/Forcing: NA (uses sondes and surface met)
- Model evaluation @CF: Raman Lidar T, wv, RH at mid-BL (900-1100 m)

LASSO: 20150627, Simulation #21
SAM & MSDA
Initialization/Forcing:

- Hourly BL Thermo profiles (T, P, wv) from Raman lidar/AERIoe @CF, AERIoe temperature at BFs (contemplating wv use)
- Hourly winds from the Radar Wind Profiler
  - More all-weather than DL, and save DL for evaluation
Lidar and profiler use progression: Alpha 2

- **Model evaluation**
  - Vertical velocity variance & Horizontal winds from Doppler Lidar @CF & BFs
  - PBL height from Radar Wind Profilers
  - Cloud-base height from Doppler Lidar
  - Considering off-hour thermo profiles from Raman lidar/AERIoe @CF

---

**Planetary Boundary Layer (PBL) Depth from Radar Wind Profiler Data**

Data from Virendra Ghate

**Cloud-Base Height from Doppler Lidar**

Color key in map
Future developments: CM4 CMDV Project

Model evaluation

- Sub-cloud turbulence
  - Object-oriented data processing
  - Vertical velocity variance and skewness from Doppler lidar

- Mass Flux
  - Estimates from Doppler Lidar and KAZR-derived updraft velocity

(And more (!), but not relevant to this breakout...)

Damao Zhang