U.S. DEPARTMENT OF ENERGY | Office of Science

Pacific Northwest NATIONAL LABORATORY

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Secondary Data Products to Be Developed

Jerome Fast

ASR Atmospheric System Research

ARM CLIMATE RESEARCH FACILITY

EMSL

Flight Journal (1)

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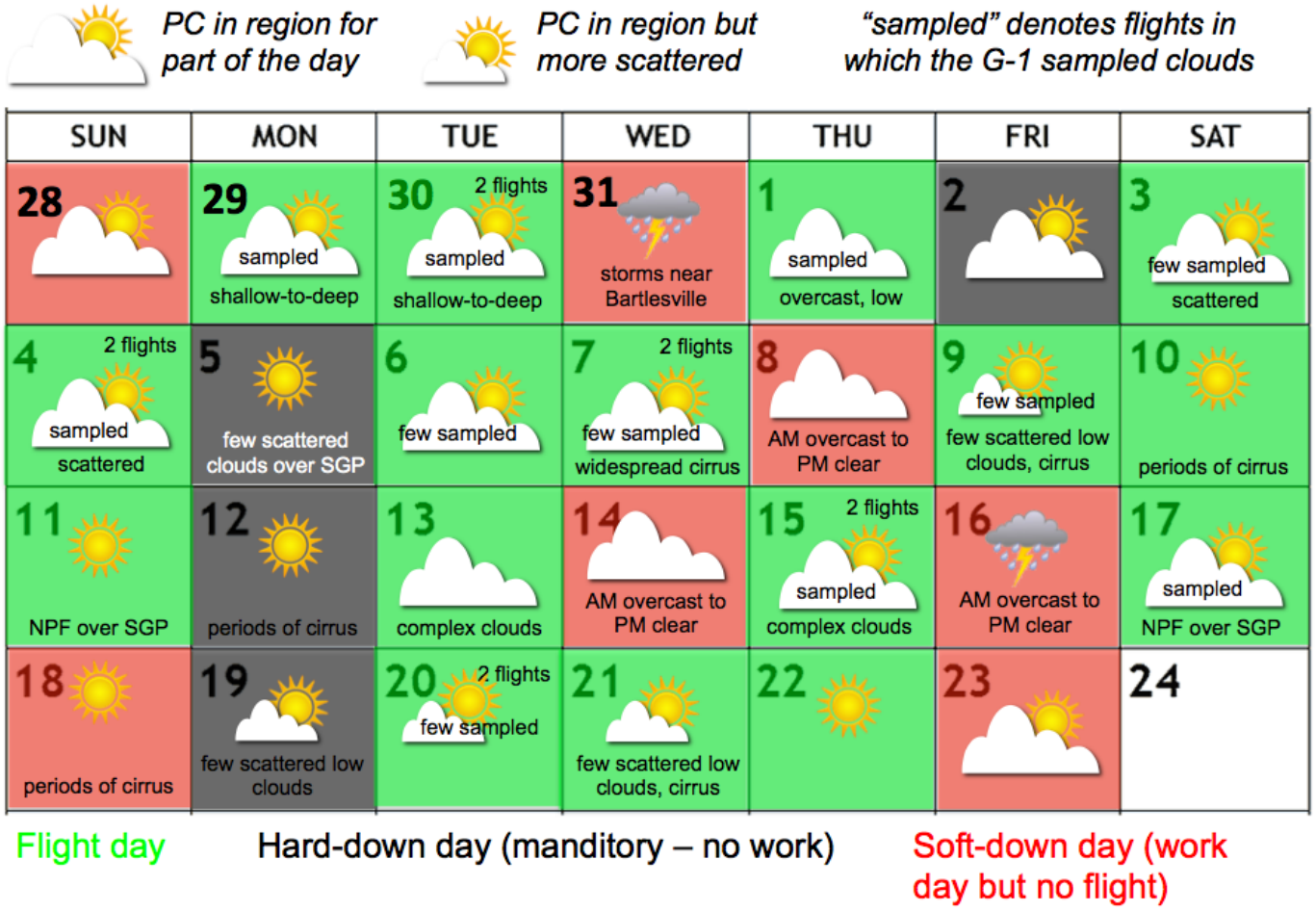
- Preparing a summary of entire campaign as well as a flight-by-flight summary

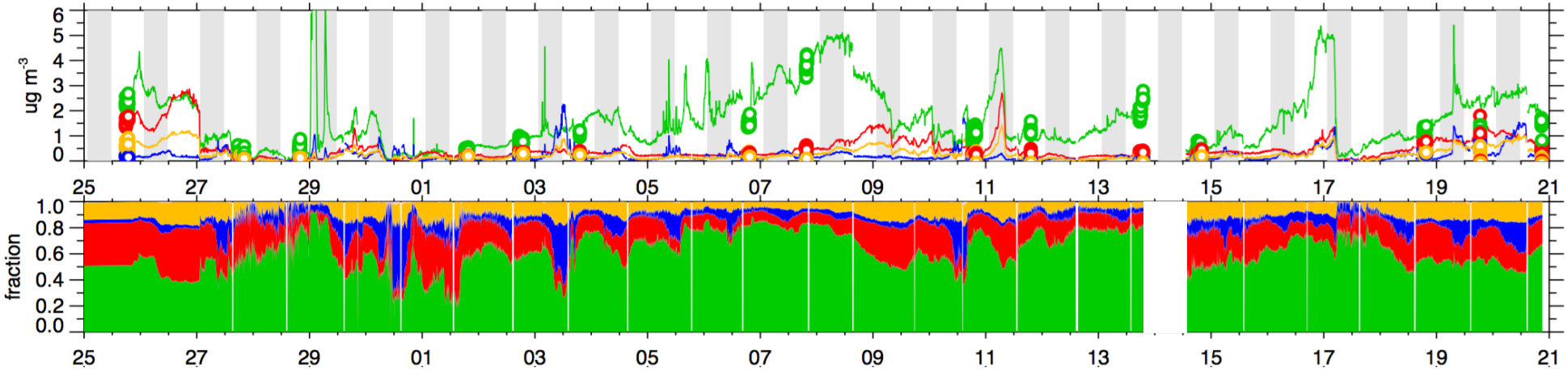


Merged G-1 Datasets

- Alyssa Matthews is working on providing additional merged data files
- While many variables are merged on a common time and space stamp, the guest instruments are not
- Checking cloud flags with aerosol data to determine if there are any “lags” associated with aerosol inlet, and then adjusting accordingly

Intercomparisons – Additional Sanity Checks

- Comparison surface and aircraft aerosol data where applicable



- Have completed G-1 and surface AMS comparisons for Phase 1, but need to expand to other comparisons (i.e. SPLAT II vs miniSPLAT, aerosol number and size, CCN, etc) and include Phase 2
- SMPS vs AMS, aerosol number from SPLAT vs other measurements
- These intercomparisons are important to assess the quality of the dataset

Intercomparisons – Additional Sanity Checks

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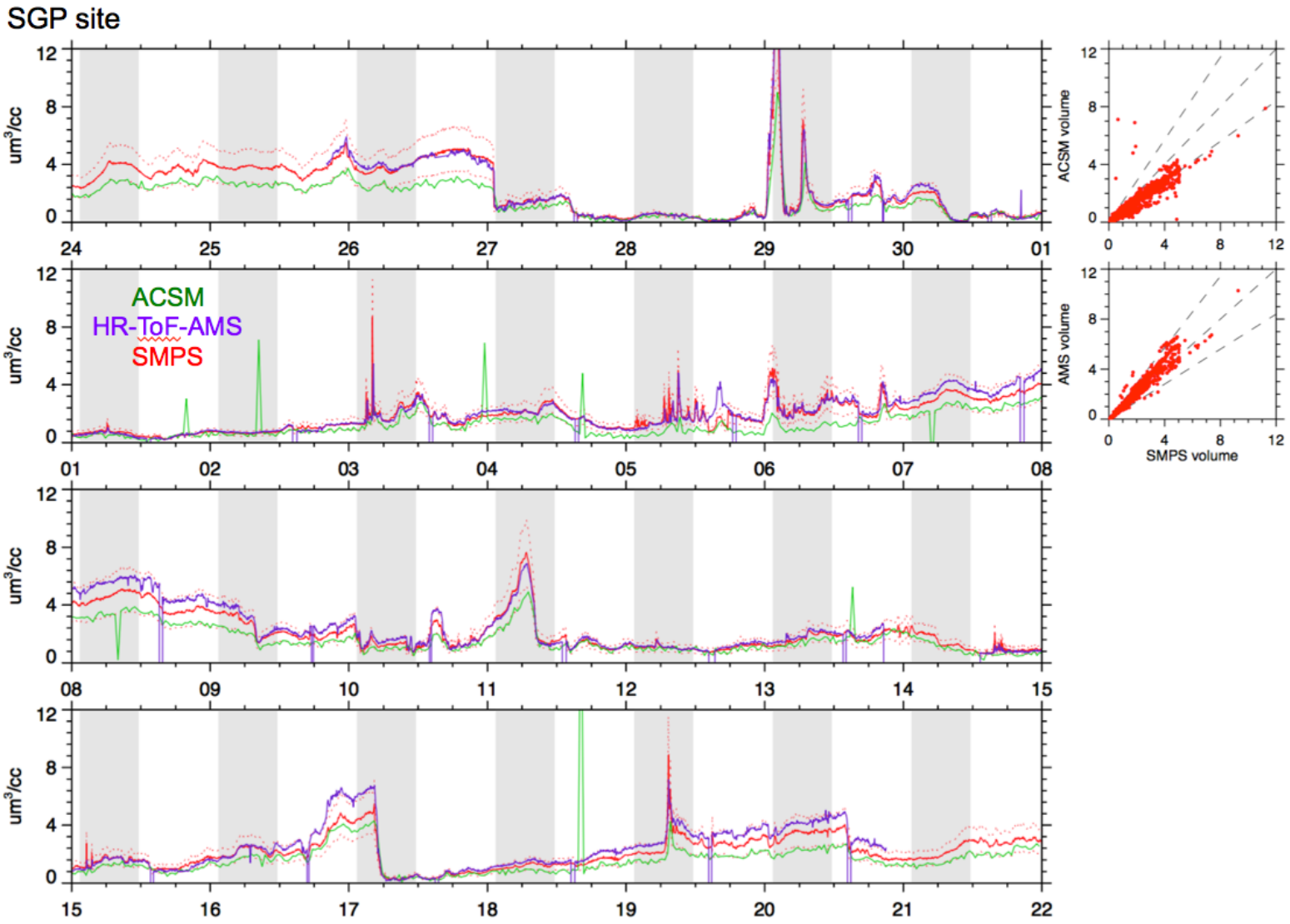
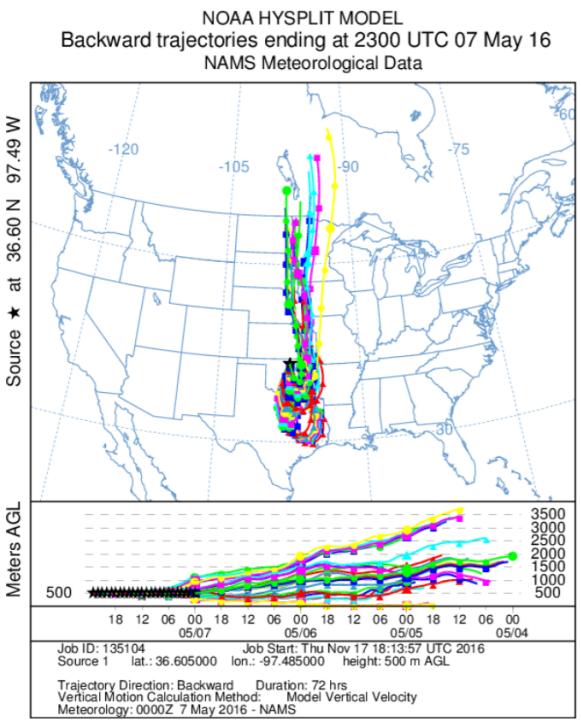
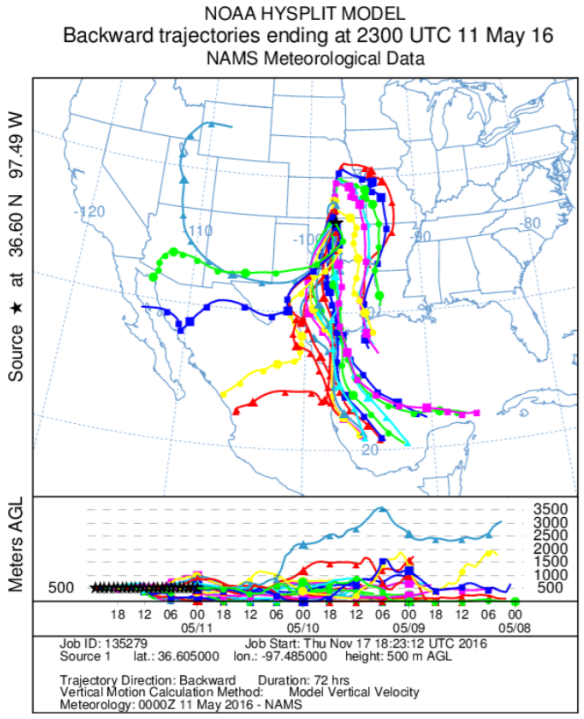
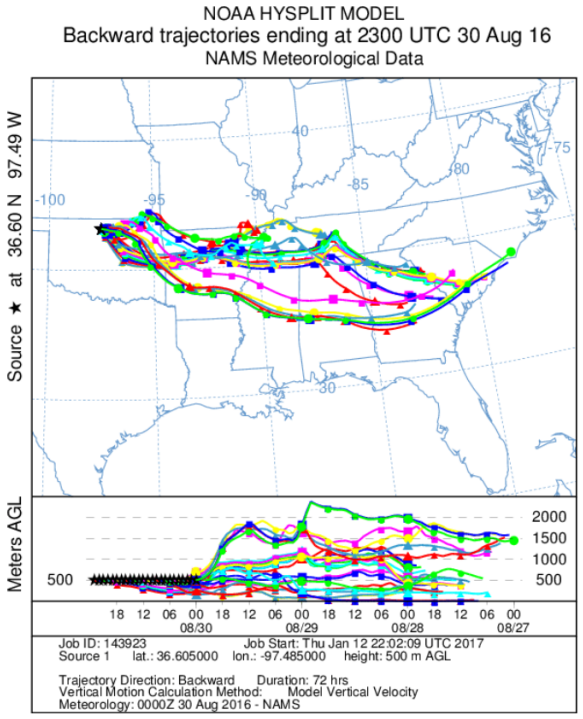


Trajectories

- Jiumeng Liu has run back trajectories using the HYSPLIT model
- Trajectories originate from the SGP site every hour at the surface, 500 m 1000 m and 2000 m
- Text files available upon request



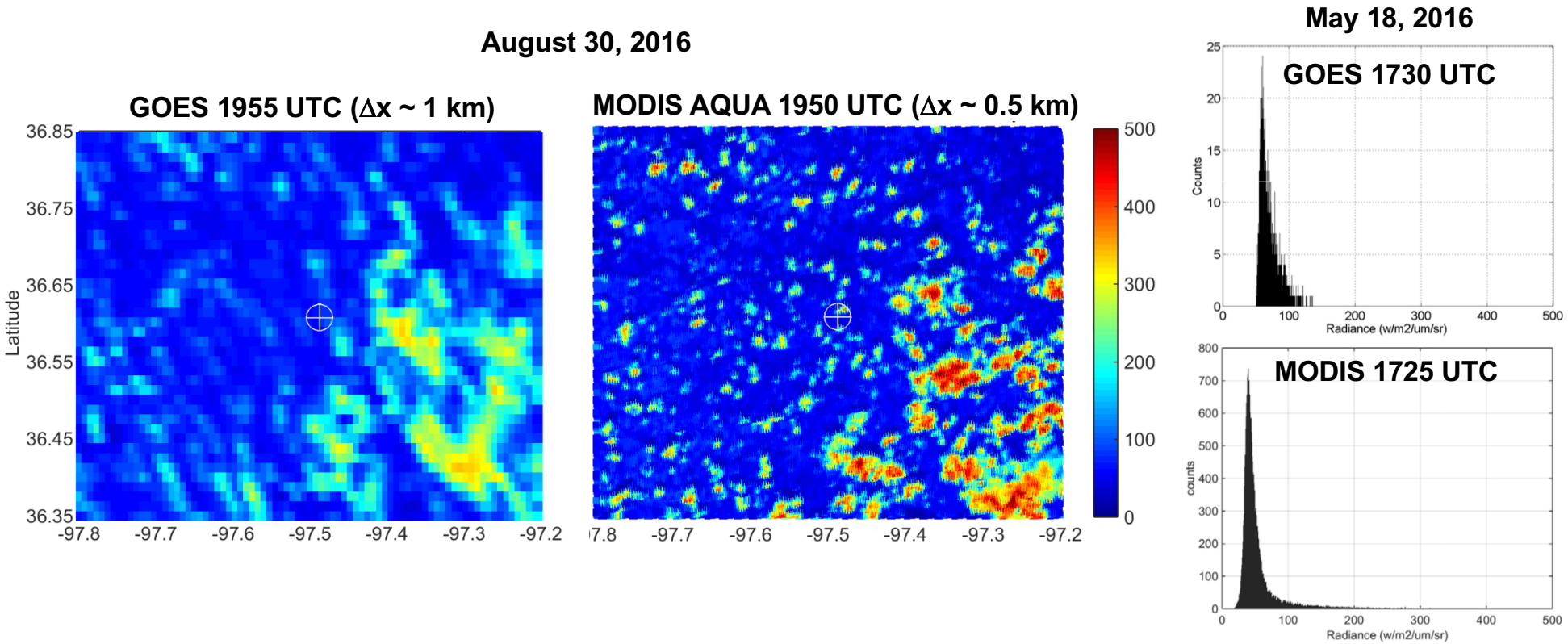




- Future: Trajectories along G-1 flight paths? Trajectories from higher-resolution WRF simulations once they are performed?

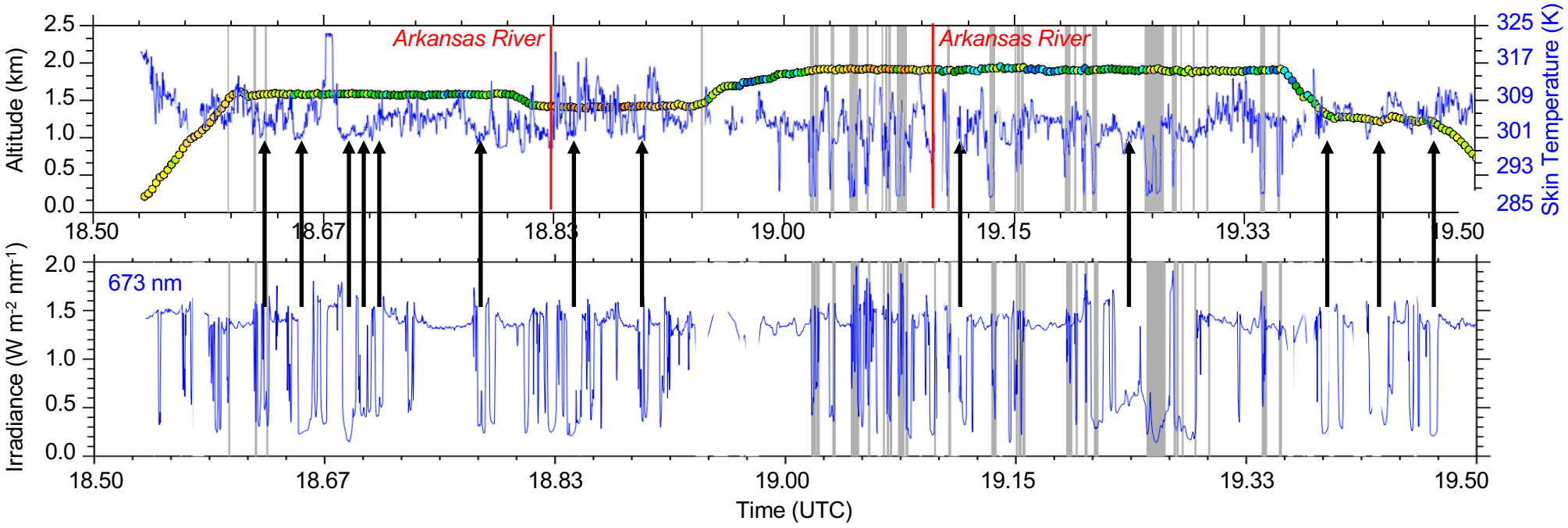
Satellite Cloud Analyses

- Zhe Feng and Duli Chand are exploring how to best use MODIS And GOES cloud products to supplement ARM measurements
- Cloud products useful to evaluate regional-scale predictions of cloud properties (PDFs of cloud fraction, brightness). Compare ARM point and spatial satellite data for evaluation of LES predictions.



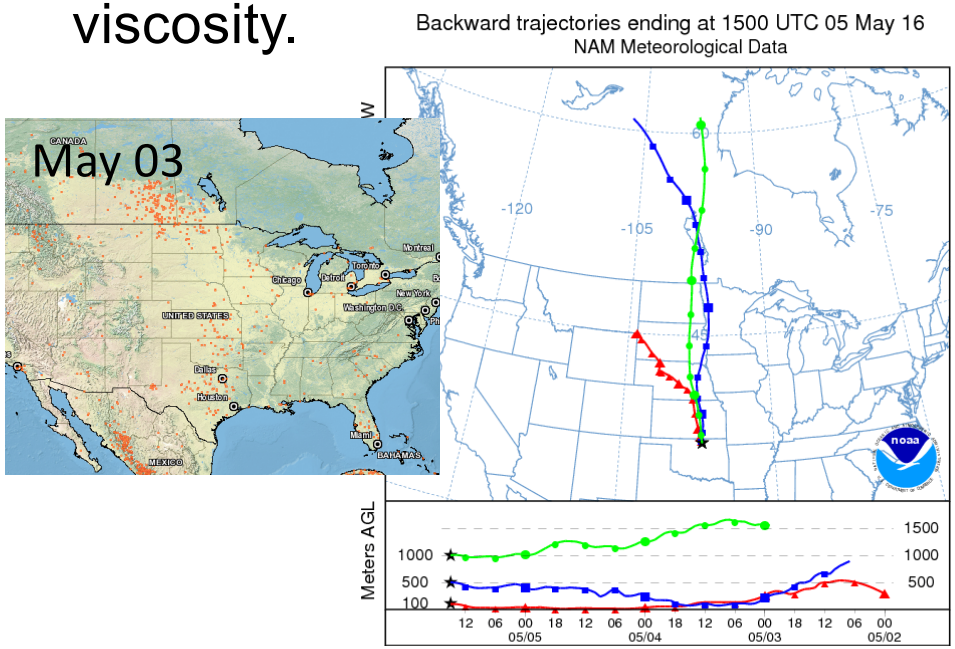
Other Cloud Flags

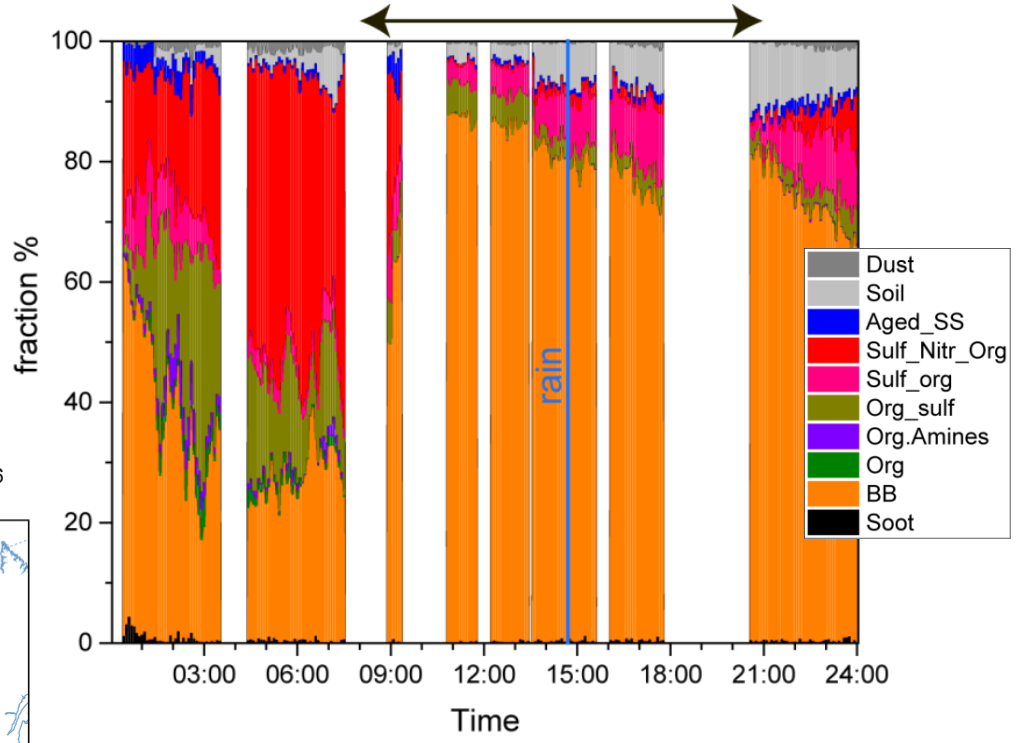
- Fan Mei has developed a cloud flag for the G-1 data to indicate when the aircraft is in cloud, but
- It would also be useful to indicate when the G-1 is just below cloud and/or shaded by clouds



Secondary Products from Mass Spectrometers

- PMF, size distribution, O:C, etc. from HR-ToF-AMS
- Particle classes from SPLAT instruments. More detailed speciation? Other properties, such as morphology, volatility, viscosity.





Model Simulations

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- Heirarchy of simulations
- ACME simulations over HI-SCALE period
- WRF simulations with Δx = 9, 3, and 1 km simulations over south-central U.S over entire HI-SCALE period(s)
- LES simulations for select HI-SCALE flights, with and without chemistry