

# DOE ARM Aerial Facility and Tethered Balloon System

JASON TOMLINSON,  
LEXIE GOLDBERGER, FAN MEI

Pacific Northwest National Laboratory

DARI DEXHEIMER

Sandia National Laboratories

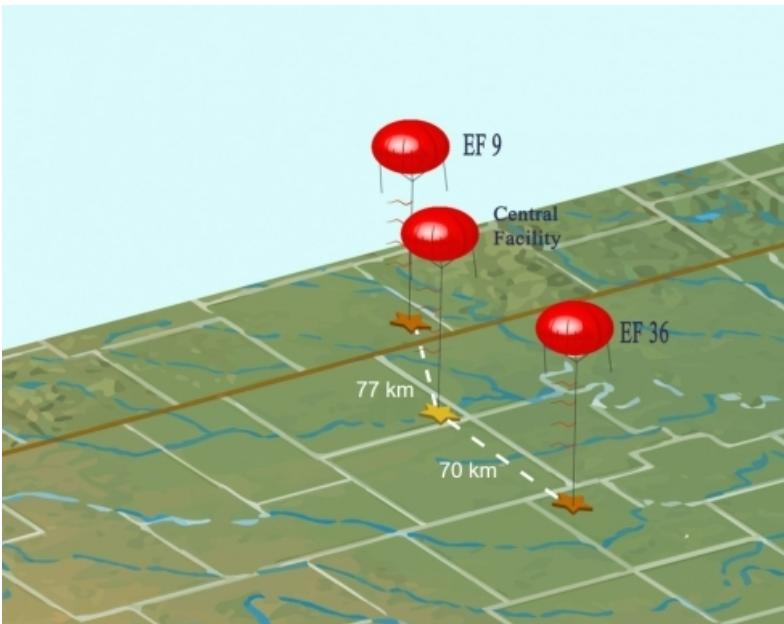
ICCAGRA, November 2021



# Summer - Fall 2021 ARM TBS Activities at SGP

- ▶ ARM TBS flights occurred at three ARM SGP facilities in OK and KS for:

- 48 hours in May 2021
- 71 hours in July 2021
- 48 hours in October 2021
- Planned in February 2022



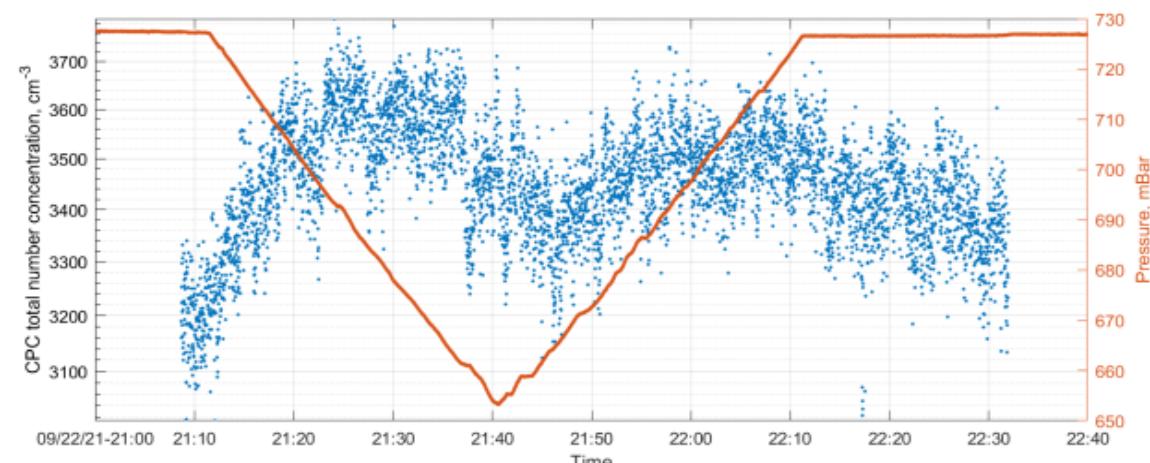
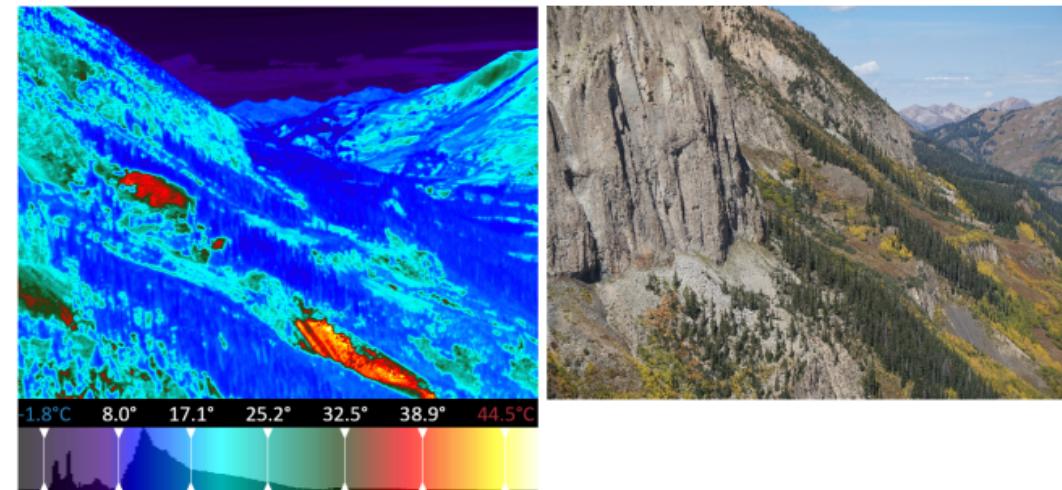
Supported proposals included:

- *Vertically-Resolved New Particle Formation and Transport Study (PI Chongai Kuang, BNNL)*: Vertically-resolved 1 nm-sized atmospheric cluster measurements
- *Toward a 4D Aerosol Characterization (PI Allison McComiskey, BNNL)*: Concurrent vertical measurements of near-surface aerosols at multiple locations over multiple annual cycles
- *Vertical profile of atmospheric particle composition via TBS (PI Swarup China, EMSL)*: Collection of atmospheric aerosol and subsequent multi-modal micro-spectroscopy analysis

## Fall 2021 ARM TBS Activities at SAIL

- ▶ Pilot ARM TBS flights occurred for 13 hours in September at Gothic, CO in support of the ARM SAIL (Surface Atmosphere Integrated Field Laboratory) campaign.
- ▶ The ARM TBS operated up to 4.2 km MSL, 1.3 km AGL during the pilot mission with 25 kg of instrumentation. Payload included aerosol counters, particle samplers, distributed temperature sensing, meteorological instrumentation, and visible/infrared imagers.
- ▶ TBS equipment has been wintered into the site and at least two TBS missions are planned for winter 2022.

Date	2021:09:23	GPS Latitude	38° 57' 18.49" N
Time	18:05:12	GPS Longitude	106° 59' 34.47" W
Emissivity	1.0	GPS Altitude	3358.788086 m
Ambient	20.0 °C	GPS Heading	335.660004°
Distance	1m		



# ARM TBS at Sandia National Laboratories



## Staff:

- ~4 full-time equivalent at SNL
- Users at national laboratories, universities, and private industry



## Platforms

- Two ARM TBSs (34 kg payload capacity)
- One Sandia TBS
- One shared TBS
- One portable, smaller payload system (20 kg payload capacity)
- One inflatable TBS hangar
- Deployable in a fixed location, dynamic ground-based locations and for marine applications from ships



## Instruments

- Over 60 meteorological, aerosol, and cloud property sensors
- Guest instruments based on an annual proposal call

