

Science and Deployment Plan for the Department of Energy (DOE) 3rd Atmospheric Radiation Measurement (ARM) Mobile Facility: Coupled Observational-Modeling Studies of Land-Aerosol-Cloud Interactions in the Southeastern United States

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The DOE 3rd ARM Mobile Facility will be relocating to the Southeastern United States (SEUS) for a five year deployment starting in the Spring of 2023. The SEUS features ubiquitous shallow-to-deep convection, with strong seasonal variability in environmental and aerosol forcings that promote isolated and organized convection to different levels of intensity. SEUS science drivers that target the onset of convective clouds include: (i) the role of large-scale vs. meso-scale thermodynamic perturbations in the onset of shallow convection; (ii) the role of the surface and prior convection on subsequent convection; (iii) identifying the key atmospheric processes in the transition from shallow-to-deep convection; and (iv) the role of moist thermals and the middle tropospheric relative humidity on shallow-to-deep convective cloud transitions. We will present our latest planning and solicit feedback on SEUS science drivers, preferred siting criteria, and instrument configurations.