

8.16 CHARACTERIZATION OF WIND TURBINE CLUTTER ON THE RADAR NETWORK AT THE SOUTHERN GREAT PLAINS ARM SITE

B. ISOM¹, I. LINDENMAIER¹

¹ Pacific Northwest National Laboratory, USA
bison@pnnl.gov

The Atmospheric Radiation Measurement (ARM) research facility deploys and operates a wide variety of instrumentation at strategic locations around the globe to better understand and represent the Earth's atmosphere. Radar systems are a valuable component of the ARM instrumentation suite because of their ability to observe cloud and precipitation particles over a broad region at a high temporal and spatial resolution. The ARM radar group operates several scanning, polarimetric radars at multiple frequencies across the globe that are designed to observe clouds and precipitation in marine, continental, and arctic environments at both fixed and mobile sites. One of the oldest and most extensive fixed sites is the northern Oklahoma Southern Great Plains site (SGP). In recent years, the area has seen a tremendous increase in the number of wind turbines around the site, which has a positive impact on the environment, but can have negative impacts on the radar data.

Wind turbine clutter (WTC) is a form of interference caused by wind turbines that can appear on radars and is very difficult to mitigate. The dynamic nature of the clutter means it occupies the same Doppler/frequency domain as is typical with atmospheric returns, and normal ground clutter filtering techniques do not apply. Given the present situation, coupled with the potential for additional wind turbines, discussions within ARM regarding current and future impacts are occurring. A study involving multiple radars at multiple frequencies is underway and focuses on the characterization and identification of WTC. This work will describe the impact of the wind turbines on the ARM radar data, characterize the signals, and discuss opportunities for identification and masking WTC.