

## **7.2 OBSERVATIONS OF THE ATMOSPHERIC BOUNDARY LAYER FROM A VERTICALLY POINTING, S-BAND, FMCW RADAR IN NORTHERN ALABAMA, U.S.A. DURING VORTEX-SOUTHEAST (2016-2017)**

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During spring 2016 and spring 2017, a vertically pointing, S-band FMCW radar (UMass FMCW) was deployed in northern Alabama during the Verification of the Origins of Rotation in Tornadoes Experiment (VORTEX) Southeast. The principal objective of these deployments was to characterize the boundary layer evolution near the VORTEX-Southeast domain. In total, 14 weeks worth of data were collected, in conditions ranging from quiescent clear skies to severe thunderstorms. Examples will be shown of boundary layer features observed during these two extended deployments, such as enhanced Bragg scatter at the top of the mixing layer, horizontal convective rolls, bioscatterer activity, and undular bores. In precipitation, the melting layer is easily identified, and abrupt transitions in its height are documented.

In 2017, UMass FMCW was upgraded with a solid state amplifier, replacing the traveling wave tube amplifier used in 2016 and prior seasons. Examples of data collected before and after this upgrade will be shown.

Additionally, we present results of application of three algorithms to these data: (1) a simple-but-flexible echo classification scheme to separate precipitation from non-precipitation, (2) a bright band identification algorithm, and (3) an extended Kalman filter-based boundary layer height detection algorithm. The latter technique will be discussed in greater detail in a separate presentation at this conference.