

Abstract Submitted
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Airborne Measurement of Insolation Impact on the Atmospheric Surface Boundary Layer JAMEY JACOB, Oklahoma State University, PHIL CHILSON, University of Oklahoma, ADAM HOUSTON, CARRICK DETWEILER, University of Nebraska, SEAN BAILEY, University of Kentucky, CLOUD-MAP TEAM — Atmospheric surface boundary layer measurements of wind and thermodynamic parameters are conducted during variable insolation conditions, including the 2017 eclipse, using an unmanned aircraft system. It is well known that the air temperatures can drop significantly during a total solar eclipse as has been previously observed. In past eclipses, these observations have primarily been made on the ground. We present results from airborne measurements of the near surface boundary layer using a small unmanned aircraft with high temporal resolution wind and thermodynamic observations. Questions that motivate the study include: How does the temperature within the lower atmospheric boundary vary during an eclipse? What impact does the immediate removal of radiative heating on the ground have on the lower ABL? Do local wind patterns change during an eclipse event and if so why? Will there be a manifestation of the nocturnal boundary layer wind maximum? Comparisons are made with the DOE ARM SGP site that experiences a lower but still significant insolation. Supported by the National Science Foundation under award number 1539070.

Jamey Jacob
Oklahoma State University

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