Wesley
Taylor
Millersville University of Pennsylvania
Dr. Gregory Blumberg, Millersville University of Pennsylvania
Dr. Eleanor Casas, Millersville University of Pennsylvania
Dr. Chuck Ward, Millersville University of Pennsylvania
Poster
The August 21, 2017, total solar eclipse offered a unique opportunity to study planetary boundary layer impacts from a solar eclipse. In Turner et al. 2018, which utilized LiDAR, flux tower, and radiosonde measurements from the Atmospheric Radiation Measurement Southern Great Plains (ARM-SGP) site. Significant effects of the eclipse were observed on the planetary boundary layer (PBL) not only at the surface but also aloft in a region of roughly 89% eclipse coverage across three coordinated sites. Taking radiosonde data from Lamont, OK at 2329 UTC 8/16/2017 as the initial conditions, runs of the Weather Research and Forecasting single column model were conducted using the Yonsei University PBL parameterization scheme. These runs were conducted with and without eclipse Besselian elements being applied to the model shortwave radiation physics to study PBL evolution. Our simulations reproduce some of the Turner et al. 2018 observations, particularly the collapse in the PBL depth reminiscent of the evening transition and the development of an eclipse-generated low level let approximately 300 meters above the surface. The simulation appears to indicate that single column models can reproduce PBL evolution even in the rare case of a solar eclipse.

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