Abstract Submitted
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Measurement of atmospheric surface layer turbulence using unmanned aerial vehicles[1] SEAN BAILEY, CALEB CANTER, University of Kentucky — We describe measurements of the turbulence within the atmospheric surface layer using highly instrumented and autonomous unmanned aerial vehicles (UAVs). Results from the CLOUDMAP measurement campaign in Stillwater Oklahoma are presented including turbulence statistics measured during the transition from stably stratified to convective conditions. The measurements were made using prefabricated fixed-wing remote-control aircraft adapted to fly autonomously and carry multi-hole pressure probes, pressure, temperature and humidity sensors. Two aircraft were flown simultaneously, with one flying a flight path intended to profile the boundary layer up to 100 m and the other flying at a constant fixed altitude of 50 m. The evolution of various turbulent statistics was determined from these flights, including Reynolds stresses, correlations, spectra and structure functions. These results were compared to those measured by a sonic anemometer located on a 7.5 m tower.

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