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Spring 2019 above-ground thermodynamic observations in convective storms from balloon-borne probes acting as pseudo-Lagrangian drifters

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Leading theories for processes such as tornadogenesis in convective storms rely on assumptions regarding the thermodynamic properties of the air above the ground within the storm's cold pool. For example, baroclinic generation along descending air parcel trajectories is one method for obtaining near-surface vertical vorticity. Unfortunately, observations have generally only been available very near the surface, not aloft along the descending trajectories, and only along roads via instrumented cars. In the spring of 2017, we used a novel approach to collect important observations above the ground using a balloon-borne system. Two balloons were employed, with one jettisoned at a particular altitude, leaving the remaining balloon and lightweight sonde with a very low fall speed, acting as a pseudo-Lagrangian drifter. The storm-relative winds carried the probes through areas of interest in the storm that have eluded other sampling methods. In the spring of 2019, we will use a modified approach with two vehicles and a greater number of single-balloon probes to more completely map out the thermodynamic structure in supercells. Observations will be coordinated, when possible, with those from other instruments (e.g., radars) to provide proper context for the thermodynamic fields. Preliminary results of this field experiment will be presented.