Clouds Second Report — Cooper Wathen

MCEN / ATLS 4151 — *Clouds Second*
Date of Report: *12/04/2025*
Cloud Type Imaged: Altostratus transitioning with virga
Location: Boulder, Colorado — facing west toward the Flatirons
Assistance: None

Context and Intent

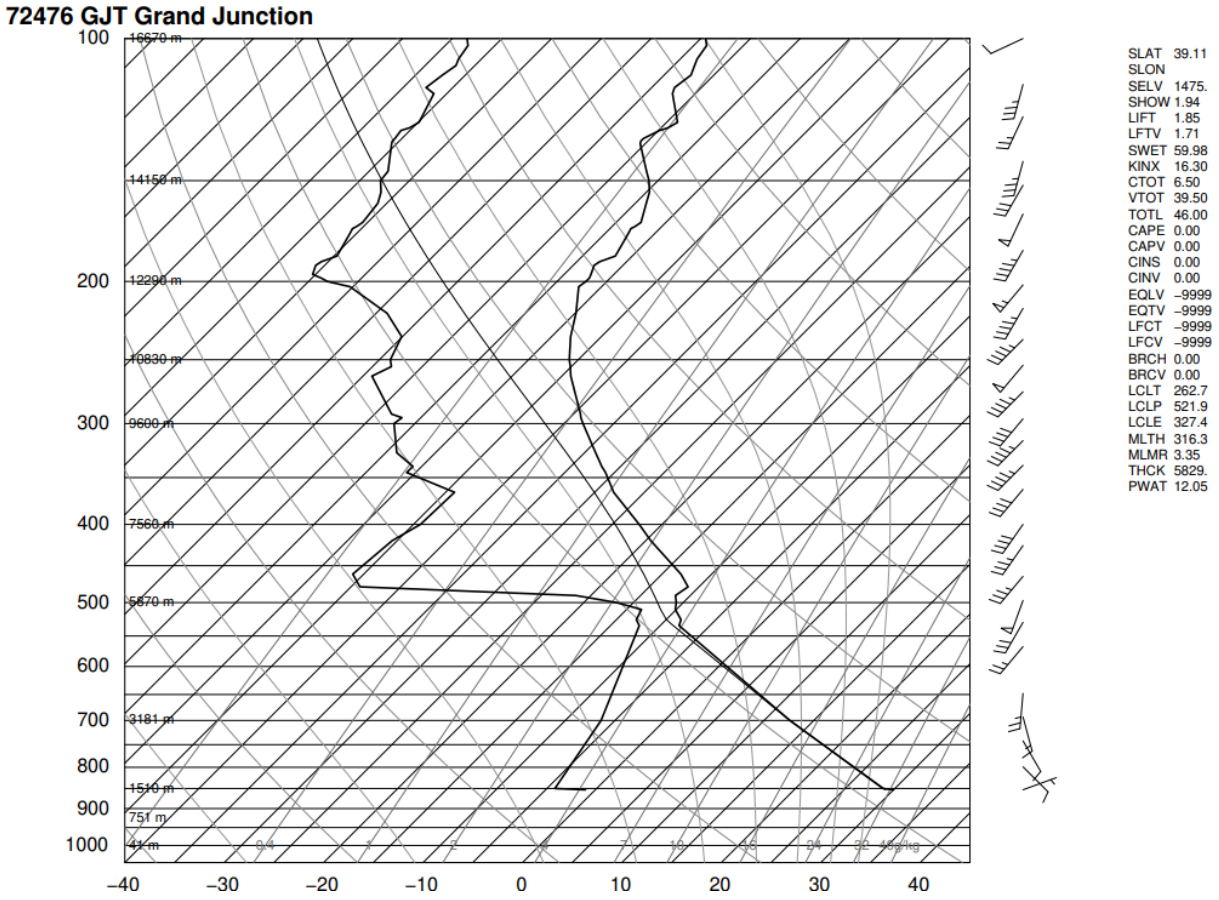
This image was taken for the Clouds Second assignment in Flow Visualization. My intent was to capture a cloud structure that illustrates layered atmospheric stability with localized vertical development. The cloud drew my attention because the lower portion appeared flat and stratiform, while the top portion rose upward into a puffy, plume-like tower, revealing shallow convection occurring above a stable base. At the same time, streaks beneath the cloud faded before reaching the ground — a visual sign of virga and evaporation in dry sub-cloud air.

I hoped to document that contrast: the atmosphere supporting some vertical lift but not enough instability for deep cumuliform growth. By photographing the scene at sunset, the lighting enhanced both the vertical plume and the softer stratified base, allowing the transitional nature of the cloud to be seen clearly.

Circumstances of the Image

The photograph was taken from my patio in Boulder, Colorado on October 10th at sunset. I was facing west toward the Flatirons, with the camera angle held low — roughly 15–20° above the horizon. Conditions were calm aside from a slight breeze, and the day had not produced rain or storms earlier. Clouds elsewhere in the sky appeared scattered but not strongly convective, and no precipitation occurred after this observation, consistent with the virga seen beneath the cloud.

Cloud Identification and Atmospheric Analysis



The cloud displays altostratus or altocumulus characteristics at its base, forming a horizontally layered structure. Above this layer, a lofted cumulus-like turret rises into warmer illumination, suggesting a pocket of buoyant uplift sitting over a stable lower layer. Beneath the cloud base, streaks descend and fade — virga, where precipitation evaporates before reaching the surface due to dry sub-cloud air.

The Skew-T sounding shows zero CAPE, meaning widespread instability was absent. However, the temperature profile indicates a possible inversion or stable region under a slightly more humid mid-layer — consistent with uplift forming a localized convective dome that could not continue to build. The dry air below the cloud explains the evaporating streaks, while weak lift aloft allows the upper turret to maintain shape briefly before spreading outward.

Photographic Technique

This photo was taken using an iPhone 12 camera in digital format. The field of view spans several miles across the southern Boulder foothills, captured at a low elevation angle to include both the illuminated cloud and its evaporating streaks.

Image adjustments included slight contrast increase, highlight reduction to preserve sunset coloring, and a crop to remove foreground buildings for cleaner composition. The camera's automatic exposure balanced the bright cloud top with darker base and landscape, allowing virga streaks and stratified edges to remain visible.

What the Image Reveals

This image captures how stable atmospheric conditions suppress vertical cloud development, causing clouds to flatten and spread laterally while precipitation evaporates before reaching the ground. The virga streaks demonstrate evaporation in dry sub-cloud air, and the glowing upper layer illustrates how sunlight accentuates stratified moisture bands at sunset.

I particularly like the contrast between warm illumination and cool mountain shadows, which visually separates the sinking precipitation from the spreading cloud sheet. If revisiting this concept, I would try different times in evening progression to see how changing illumination alters visibility of the virga. Higher vantage points or time-lapse methods could also show the subtle decay and motion of the cloud over time.