

Cloud First Report

Flow Visualization MCEN 5151-001

Oct. 4th, 2026

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*Alto*cumulus *Lenticularis Duplicatus*

Sept 17th, 2026, 6:49 PM

Boulder, CO

North-west sky

Purpose

This photo was taken as a submission to the Clouds First assignment in Flow Visualization at the University of Colorado Boulder. The intent was to capture the beauty and physics that can be seen in the sky. Captured here is a still of altocumulus lenticular clouds (ALD) as well as some stratocumulus, altocumulus, and fractus. This report will mostly focus on the ALD clouds, as they are the main focus of the image. Table 1 below describes the circumstances of the image.

Location	Boulder, CO
Direction	Northwest
Camera Angle from Horizontal	15°
Date	Sept 17 th , 2026
Time	6:49 PM

Table 1: Circumstances of the image.

The Clouds

The image shows a mostly cloudy sky with several distinct cloud layers. The most prominent formations appear to be altocumulus clouds with possible lenticular characteristics, identified by their smooth, elongated shapes, well-defined edges, and stacked appearance. Additional irregular gray clouds are visible near the horizon, while a broad layer of cloud cover extends across the upper sky (World Meteorological Organization, n.d.). The Skew-T sounding, in Figure 1, is from September 17, 2026, at 6:00 PM MDT, and shows relatively moist air between approximately 550 and 650 hPa (University of Wyoming, 2026).

Station 72476 at 00 UTC 18 Sep 2026
 GRAND JUNCTION/WALKER FIELD, CO., USA
 Latitude: 39.120 Longitude: -108.524

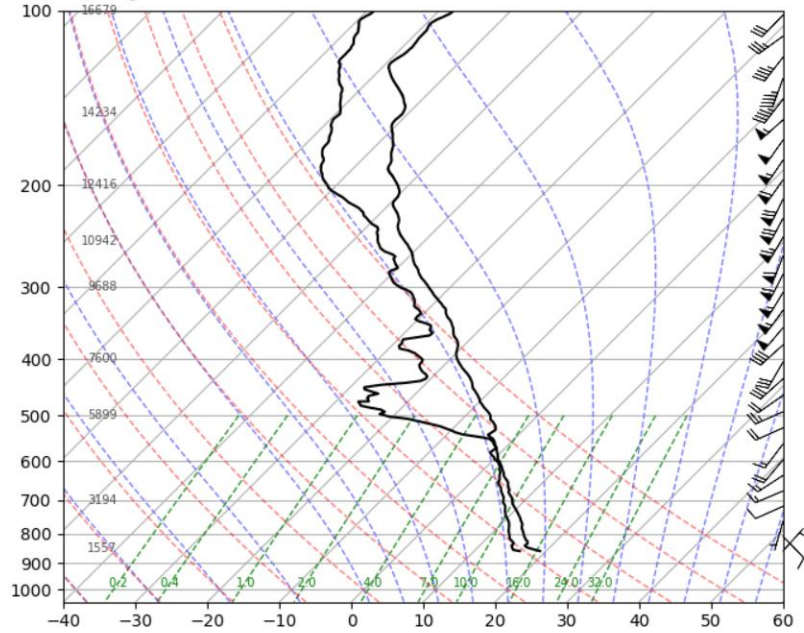


Figure 1: Skew-T diagram from University of Wyoming Atmospheric Science (University of Wyoming, 2026).

This supports the possibility of middle-level clouds at approximately 2-3.5 km above the horizon. The smooth cloud formations may have developed through orographic lifting and atmospheric gravity waves as winds flowed over the surrounding mountains, as seen in Figure 2.

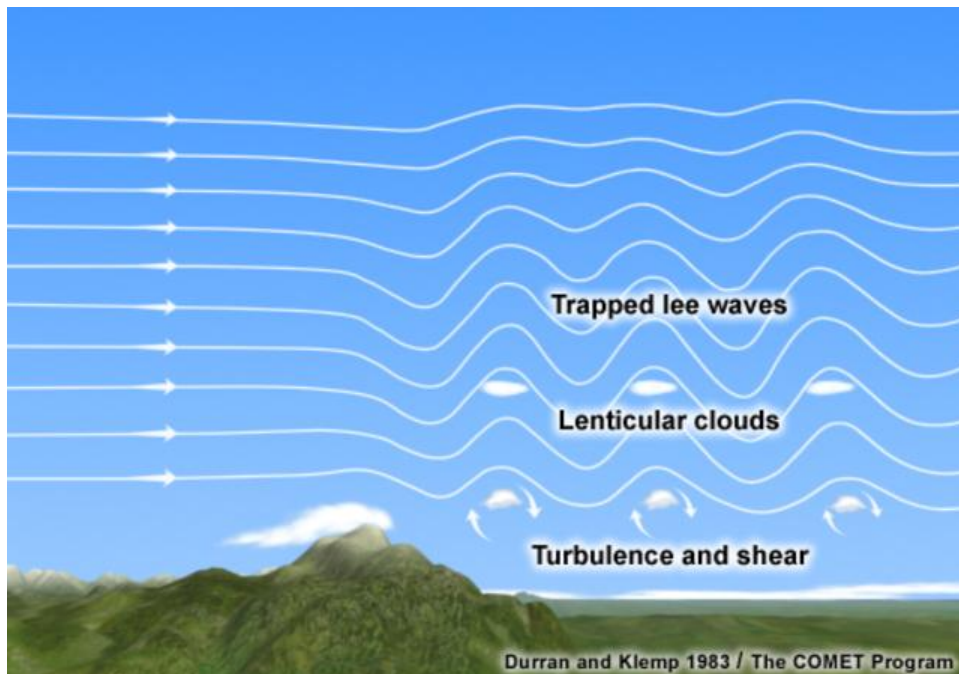


Figure 2: Diagram of air currents flowing over the mountains leading to cloud formation (Bailey, 2019).

In a stable atmosphere, displaced air can oscillate vertically, cooling and condensing as it rises and warming and evaporating as it descends. This process can produce the smooth, disk-shaped appearance visible in the photograph (Bailey, 2019). The sounding also suggests stronger winds aloft, which could support mountain wave formation. Rainfall and cooler temperatures reported earlier on September 17 indicate unsettled weather, consistent with the extensive cloud cover.

Photographic Technique

This image was taken with an iPhone 17e using standard settings. The phone camera was used instead of the digital camera because it was available during the time these clouds were out. The camera specifications can be seen below in Table 2.

Focal Length	26 mm
ISO	20
Aperture	f1.64
Shutter Speed	1/419s
Field of View	70° Horizontal, 50° Vertical
Original Dimensions	4284 x 5712
Edited Dimensions	1300 x 900
Distance from Clouds	~2 miles

Table 2: Camera specifications

Light post-processing was done to the original image, including cropping and some light contrast changes. The original and post-processed images can be seen side by side below in Figure 3.



Figure 3: Comparison of the original image (left) and the post processed image (right).

Conclusion

The image reveals the science and beauty behind cloud formation. I've learned so much about different clouds, formations, wind patterns, and naming conventions. I love the different cloud types that can be seen in the photograph and how they bring depth to the image. One thing I dislike is some of the infrastructure that can be seen in the photo. Particularly, the street lights and electrical wires. To improve this shot, I would have gone to a higher vantage point to hopefully get above all the man-made infrastructure and get an image of the clouds and mountains. I didn't crop out the street lights because I wanted the mountains to be in the shot, since the mountains are a main contributor to this cloud formation.

References

Bailey, I. (2019, September 16). *Lenticular Clouds and Mt. Washington*. Retrieved from Mount Washington Observatory: <https://mountwashington.org/lenticular-clouds-and-mt-washington/>

University of Wyoming. (2026, September 17). Retrieved from <https://weather.uwyo.edu/upperair/sounding.shtml>

World Meteorological Organization. (n.d.). Retrieved from <https://cloudatlas.wmo.int/en/altocumulus-lenticularis.html>