

Clouds First Report

Fall 2019

MCEN 4151-001: Flow Visualization

Date: 9/10/2019

Student: Abdullah Alsaffar

Instructor: Jean Hertzberg



I. Introduction

For this assignment, we wanted to capture various beautiful cloud images and discuss their types with the rest of the class to learn more about the physics behind each type of them. So, for my first professional cloud image, I decided to capture a refreshing photo of an early morning clouds.

II. Experiment Set up

This image was taken on the 10th of September of 2019 around 7:34 a.m. in Boulder, Colorado. The exact location of the photo is the intersection between the 30th street and Euclid street. The photo was taken from an approximate height of 1.5 meter above ground level with an angle of 50°.

III. Cloud Physics

The clouds that I captured for this task can be defined as stratocumulus clouds with three layers as you can see from the diagram below. The lowest layer was formed around 1800-2000m altitude which is a typical height for stratocumulus. The other two layers were formed around 5 km and 10 km. The lowest layer of clouds had a temperature of 15°C, and as the height of the cloud increased, the temperature decreased to about -20°C. The CAPE number is greater than zero which means the clouds are unstable. Moreover, the pressure was fluctuating from 700 to 250 millibars. As for the wind, it was coming from the south-west direction.

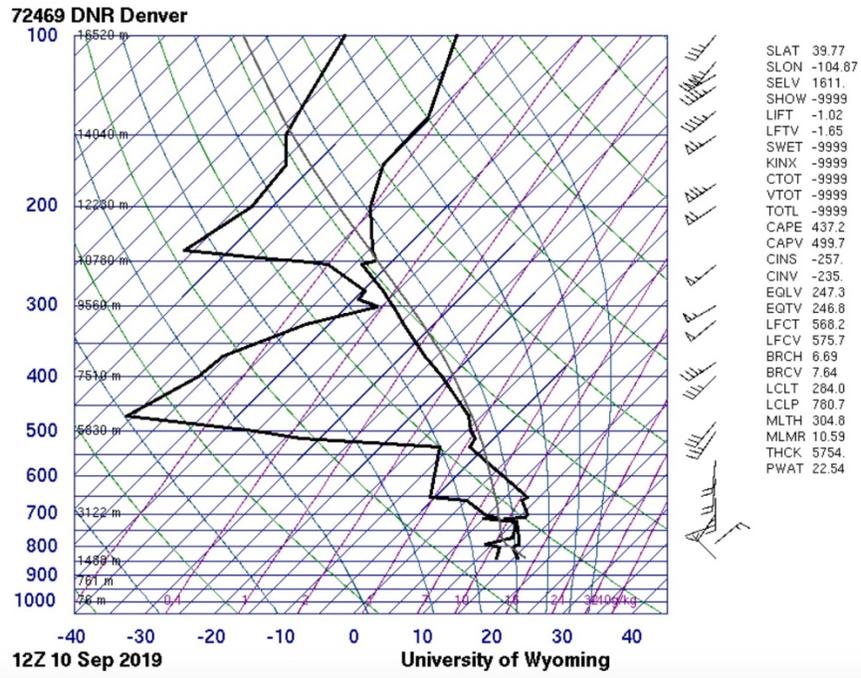


Figure 1. Skew-T plot.

IV. Camera Settings & Photo Editing

The photo was captured with my iPhone X camera. I used auto focus with 1/3,00.3 exposure time, f/1.8 for aperture, an ISO of 50, and a focal length of 4mm. Also, the dimensions of my photo are 4032×3024 pixels. As for the image editing, I used the iPhone built-in editing program. To edit different features simultaneously, I played with the “Auto” feature till I was satisfied with the outcome as indicated in Fig.3.



Figure 2. Original photo

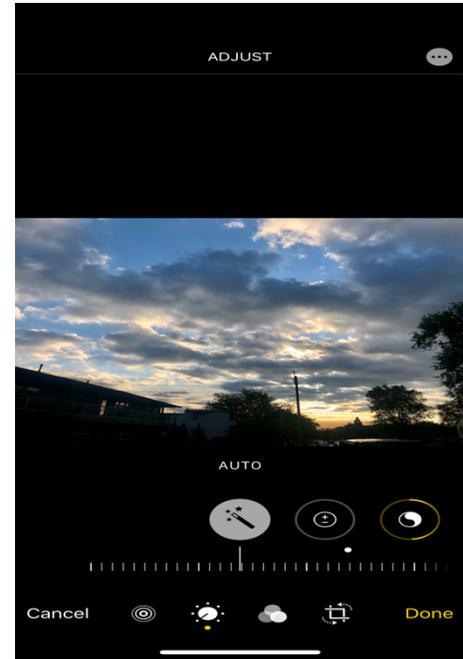


Figure 3. Editing settings

V. Conclusion

This task helped me gain more knowledge about clouds in general where I found myself subconsciously looking and perceiving the nature of the clouds more. My intent behind this photo was to capture the beautiful morning rays coming through and between the clouds, and I believe that I achieved my goal.

VI. References

<http://weather.uwyo.edu/upperair/sounding.html>