

# Cloud Second Report

*Clouds over Boulder*



**David Leng**

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Flow Visualization

## INTRODUCTION

We see clouds in the sky on almost a daily basis, but very seldom do we analyze their formations or beauty. This image was captured for the purpose of the Fall 2016 semester course Flow Visualization. The image above was taken on Flagstaff Mountain in Boulder, Colorado on November 13th at approximately 2:15 PM. The purpose of this image is to capture the beauty of clouds as well as to serve as a tool for understanding the physics behind them. Understanding clouds can tell us about the atmosphere as well as weather predictions.

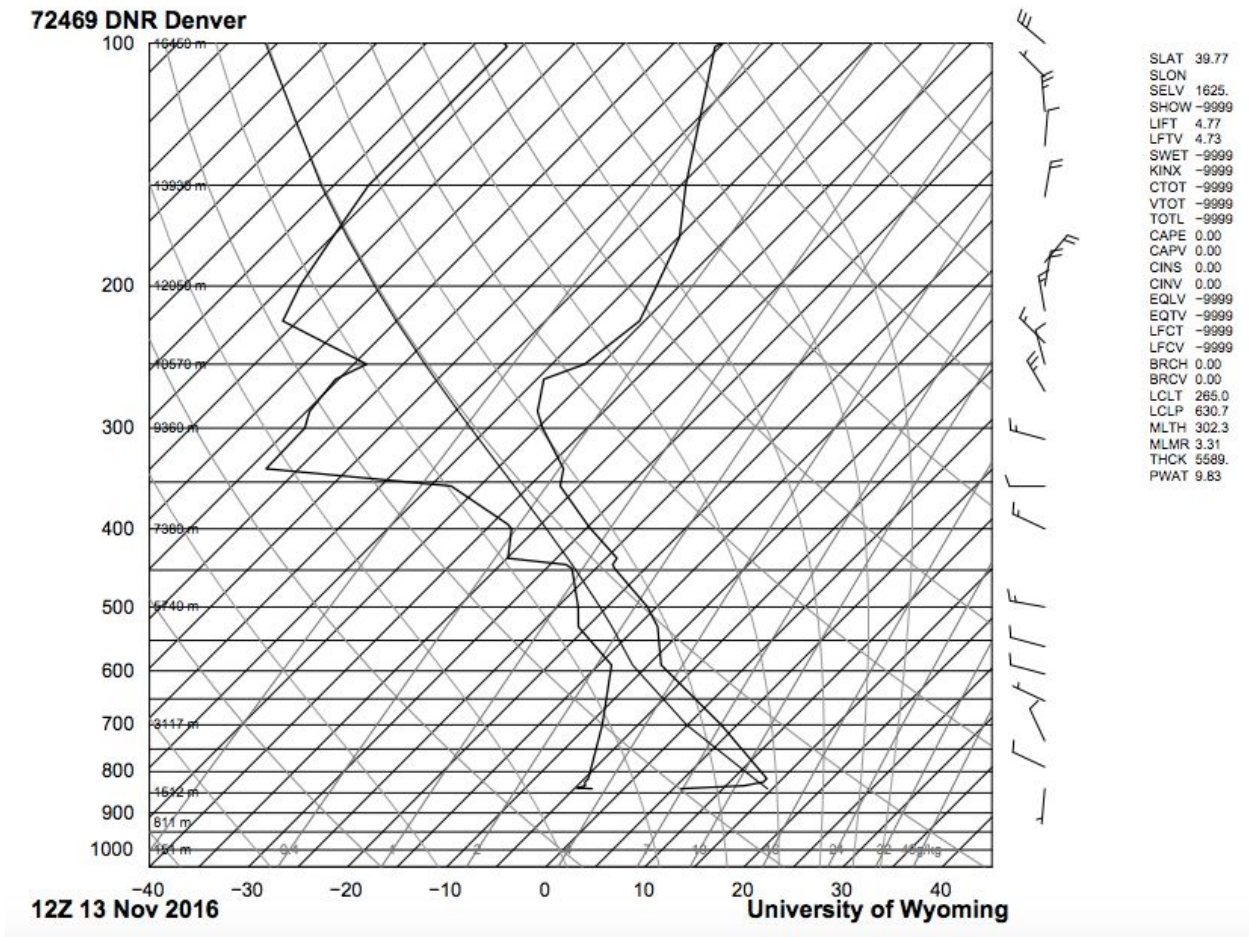


Figure 1. Skew T Diagram [Ref 1]

The image depicts cumulus clouds in the sky. The flat bottoms of the clouds can easily be seen which supports is a trait of cumulus clouds. With an understanding of the types of clouds in the image it is reasonable to assume that the clouds are at an altitude less than 1000m. The elevation of Boulder is at 5,430 ft while the peak of Flagstaff is at 6,983 ft. Having the elevation of the city and the mountains helps give the viewer an idea of the altitude the clouds are at which gives reason for there to be cumulus clouds. The CAPE for this day was 0 [Ref 1] meaning the atmosphere was stable.

The visualization technique used to capture this image was to have the white clouds contrast the blue sky. The image was created using an Olympus E-M5 mirrorless camera. With the natural sunlight this image was captured with a relatively low ISO of 200. The F-stop was at f/11, exposure time 1/500sec, and at a focal length of 22mm. The image does not seem to be focused properly. The final image has been cropped and edited from Figure 2. Using photoshop I made the skies more blue, and increased the contrast a bit as well as increasing the exposure and shadows. The rest of the post processing was done to highlight the formation of the clouds. The major difference from the original to the edited version is the definition in the clouds. Bringing out the blue in the sky brings out the contrast and gives the clouds the fluffy yet defined feature.



Figure 2. Raw Cloud Picture

## CONCLUSION

The image allows one to clearly visualize the beauty and flow of clouds. As seen in the image the clouds seem to cover the sky and continue to do so into the horizon. The clouds also seem to come in big chunks and some smaller ones. Cumulus clouds are clearly depicted in this image as well as the atmosphere present. The intent of the Cloud second project was fulfilled in how the clouds have been captured and analyzed. Ultimately I hope to be able to photograph and analyze more unique clouds.

## REFERENCES

[1] University of Wyoming. Atmospheric Sounding.  
<http://weather.uwyo.edu/upperair/sounding.html>