Clouds 2

Flow Visualization

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Introduction

The assignment is to photograph clouds again. As I have learned from the earlier assignment, it is much easier said than done. This time I was more prepared and had begun taking my camera around. I was also prepared to stop in the middle of the highway to capture the image.

Image Setup

The image is taken 15 minutes west of Limon, Colorado on March 1, 2009 around 4:30 PM. The camera was facing west towards the Rocky Mountains and approximately 45 degrees from the horizon. The camera was mounted on a tripod to keep the camera as stable as possible.

Cloud Science

The clouds in the image should be altocumulus clouds. The sky to the north of the clouds was clear and there are many clouds similar to the ones in the image more to the southwest and south region. The satiability of the atmosphere can be predicted with a Skew-T plot, shown in Figure 1. The atmosphere on this day should be stable looking at the adiabatic line and the actual temperature from the weather balloon. The estimated elevation of the clouds should be around 6,000 meters looking at the skew-t plot because that is where the dew point line is really close to the actual air temperature. Therefore, only a slight amount of cooling will allow clouds to form. I believe the cloud was demostrating the Kelvin–Helmholtz instability because it was a windy day and that speed at the lower portion of the cloud was quicker than the upper portion of the cloud. The velocity difference between the two fluids, the cloud and air, was enough to create the Kelvin–Helmholtz instability.

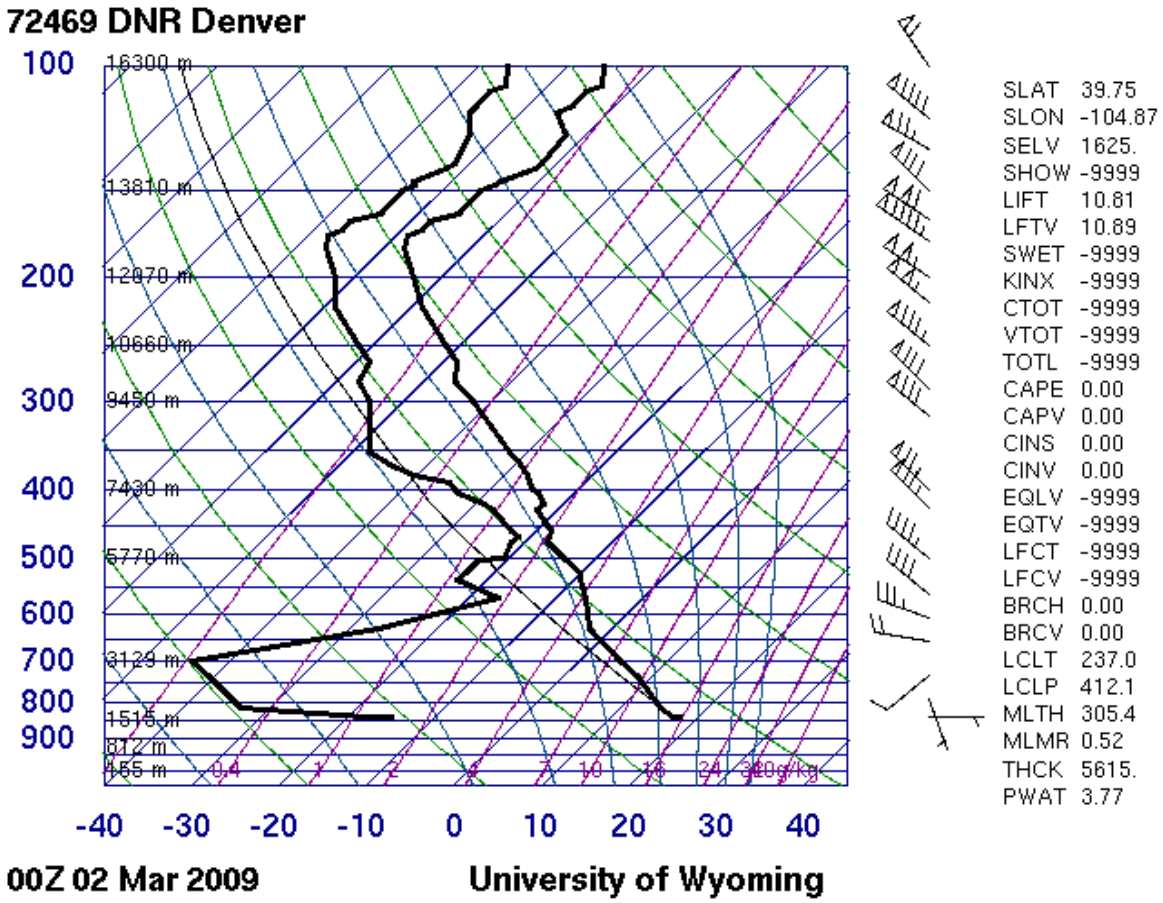

Figure 1: Skew-T Plot March 02, 2009: 00Z

Photographic Technique

The image was captured using a 12.2 mega pixel Canon Rebel Xsi digital signal-lens reflex (DSLR) camera with no flash. An 18-55mm image stabilizing lens with was mounted on camera. The depth of field was as large as possible because the aperture setting was set to F6.3, with a focal length of 84.0 mm. The ISO speed was set to a low setting since the image was captured in some daylight, 800. The shutter speed was set to 1/80 of a sec and the white balance was set at daylight. The image size is 4272 x 2848 and the image quality was set at the highest possible, RAW format (CR2). I decided to not crop the picture or alter the contrast using curves because I wanted to leave the tree visible to show the distance of the clouds compared to the branches of the tree. The colors in the image are a good representation of the actual colors seen with the eye. I felt like the colors were pleasant.

Conclusion

The image that I captured in my opinion was great because it was something that I have not seen before or just have not really noticed until now. I wish that day was not as cold or the area was not outside of Limon on the side of the I-70 because I would have been able to take more pictures of the cloud's progression. The part of the image I like is the separation of the clouds; it looked very uniform. Part of the cloud also resembles the surface waves of the ocean.

References

Skew-T : University of Wyoming, College of Engineering: Atmospheric Sounding <http://weather.uwyo.edu/cgi-bin/sounding?region=naconf&TYPE=GIF%3ASKEWT&YEAR=2009&MONTH=02&FROM=2300&TO=2300&STNM=72469>

Kelvin–Helmholtz instability, Wikipedia <http://en.wikipedia.org/wiki/Kelvin%E2%80%93Helmholtz_instability>