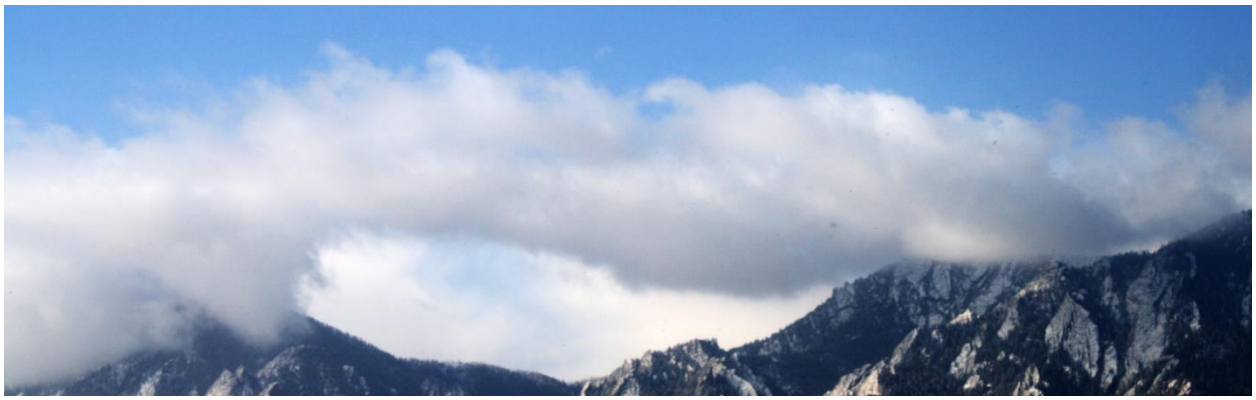
Clouds 1



Elizabeth Crumb

Flow Visualization – MCEN 4151

February 28, 2013

Elizabeth Crumb
2/28/13
Clouds 1

This image was taken for the first Cloud assignment for Flow Visualization, MCEN 4151. The assignment was to capture an image of a cloud formation. The intent of this image was to capture a cloud formation near the mountains and examine the effects that they have on the cloud.

The image was taken from a second story window in Boulder, CO facing southwest. The camera was angled upward at approximately thirty degrees from the horizontal. The image was taken on February 11, 2013 at 9:30 am.

The cloud in the image is a stratocumulus cloud. This determination was made based on the height of the cloud. The cloud is no higher than the mountains and the atmosphere, according to the skew-T chart, was stable at the time. The cloud height of approximately 1,450 ft and stable atmosphere indicate that the cloud is a stratus cloud but the puffy nature of the cloud top indicates that it is stratocumulus rather than stratus cloud. The rest of the sky had similar clouds in it and there was no appreciable weather that day. At the time of the image there was no wind[1]. The stratocumulus clouds are typical for these conditions. Other expected clouds include stratus, altostratus, cirrostratus, and cirrus.

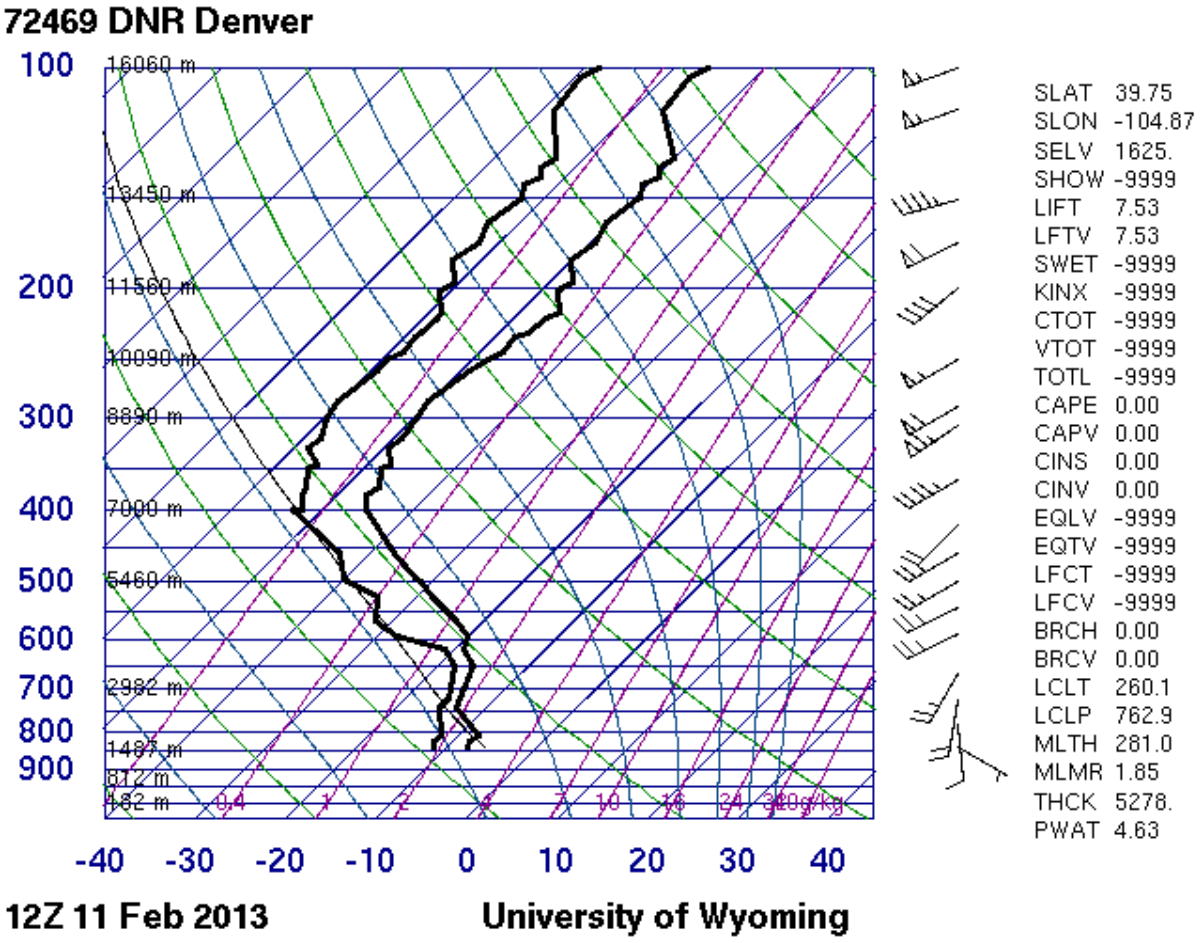


Figure 1: Skew-T plot of Denver weather for 6 AM February 11, 2013[2]

As the skew-T plot[2], Figure 1, demonstrates the atmosphere was stable at 6 am on the 11th of February. The CAPE value of 0.00 tells us this. The skew-T plot indicates that clouds should be expected around 750 to 630 meters because the temperature and dew point lines are relatively close together. As the skew-T plot indicates and as was reflected in the sky on the 11th there were few to no clouds in the upper atmosphere.

The cloud is roughly 2 miles from the camera and the photo was taken with a Canon EOS Digital Rebel XS with no external lighting. The F-stop was f/11, the exposure time was 1/250 seconds with a focal length of 55 millimeters and the ISO value is 200. The original and edited images were 3888 by 2592 and 3888 by 1218 pixels. The original image seen below was Photoshoped by cropping the top and bottom of the image, enhancing the contrast and brightening the image.

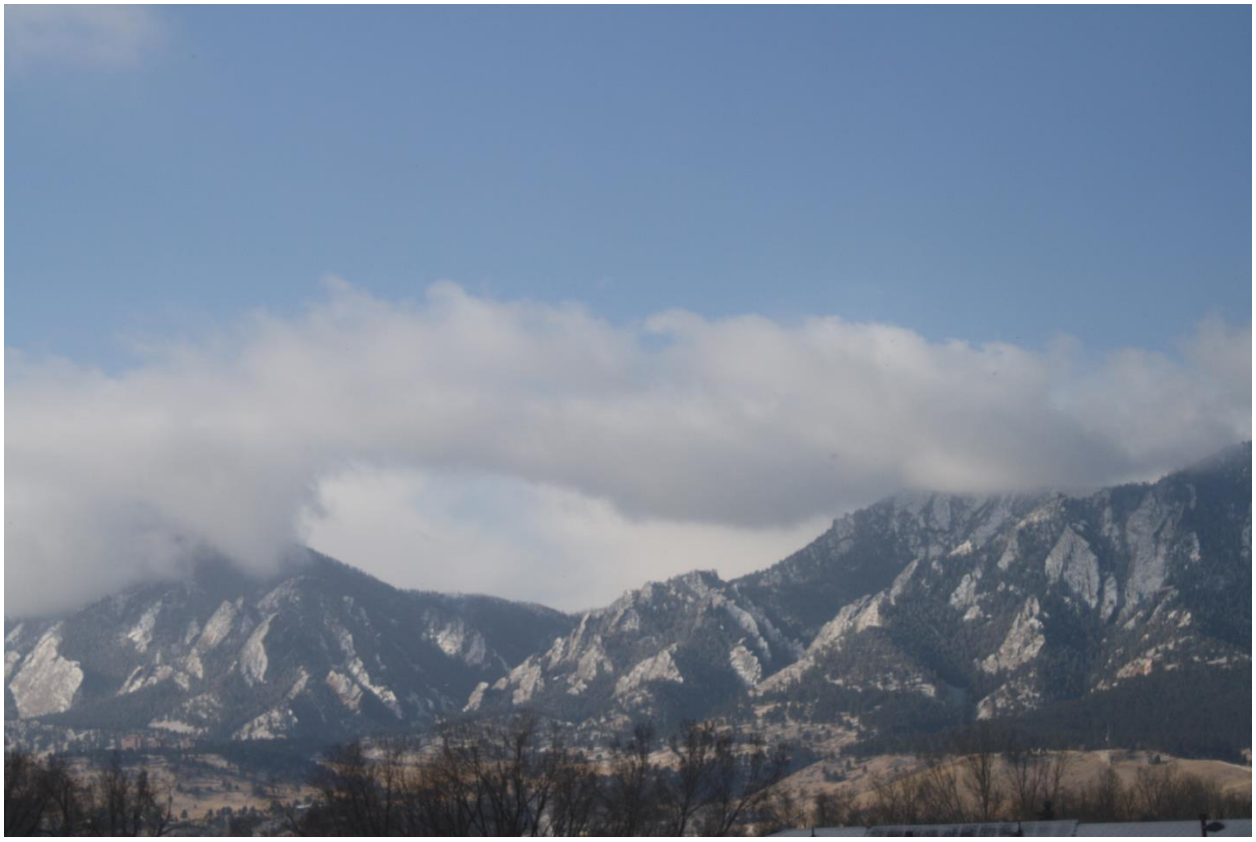


Figure 2: Original Image

The image reveals the way the clouds move over the mountains and I like the way the cloud appears to be on both the front and back sides of the mountain. The image also reveals the development of Kelvin Helmholtz instabilities on the top of cloud. I believe this image fulfills my intent to capture a cloud formation near the mountains that demonstrates the effect that the mountains have on the cloud. I would like to improve the quality of the original image and this idea could be developed further by capturing more images of clouds in a similar location and comparing them. It would also be interesting to find a more developed display of the Kelvin Helmholtz instability.

References

1. "WeatherSpark Beta." *Beautiful Weather Graphs and Maps*. N.p., n.d. Web. 23 Feb. 2013.

2. "Atmospheric Soundings." *Atmospheric Soundings*. University of Wyoming, n.d. Web. 23 Feb. 2013.