MCEN 4151: Flow Visualization

Section 001

Cloud First

10/28/2020

By: Edgar Palma

Altocumulus Clouds 10/09/2020

Boulder at 5:30 PM

The Cloud First assignment was able to give me the opportunity capture the natural phenomenon of clouds while also allowing me to apply all the photography techniques that I've learned thus far this semester. The assignment also gave me the opportunity to learn why clouds are formed and what factors, such as environmental conditions, contribute to the type of clouds end up forming. Throughout this assignment I was introduced to what a Skew-T diagram was and the ability to read what the Skew-T diagram represented during certain days. The picture that I ended up taking was on October 9th, 2020 at around 5:30 PM in Boulder fairly close to the university's East Campus. The direction that these clouds were taken from were north and the angle from the horizontal was at a 15-degree angle. The type of cloud that I was able to capture in my image was a bunch of Altocumulus clouds.

Throughout the last past couple of weeks, we have learned a lot on how to figure out what type of clouds we are looking at. In order to identify what type of clouds were present in my capture image, I used the Skew-T diagram during the day taken and I also used the clouds classification document that was provided to us. *Figure 1* below shows the Skew-T diagram for October 9th for the time around 5:30 PM. The diagram shows that on this day the value for the CAPE = 72.20 which meant that the atmosphere was unstable and resulted on these cloud formations. When trying to understand the altitude of the clouds, we can look at diagram where it shows a close proximity between the Dewpoint Curve and the Temperature Curve. With this information the clouds altitude is around 5800m.

Now stepping away from the Skew-T diagram, we can focus on the physical aspects that the clouds have. The clouds look like full "cotton ball" with a distinct shape. This distinct shape resembles a cauliflower outline which tells us a fair amount about the cloud. By looking at the information stated from the Skew-T diagram along with the physical visualization of the clouds, we can determine that these are Altocumulus clouds.

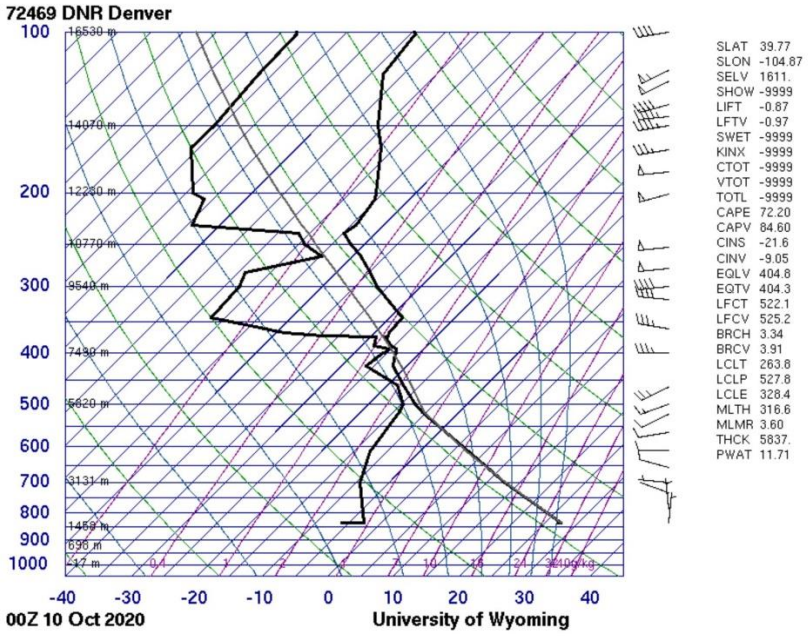

Figure 1: Skew-T Diagram at 00Z 10 October 2020

The image was taken on the camera of an iPhone XS at about 5800m away. I ended up using a focal length of 6mm with an F-stop of f/2.4, an exposure time of 1/685 sec. and an ISO speed of ISO-16. For the post-processing, I decided to use Darktable to create more of a contrast between the clouds and the sky. To do so I ended up playing around with the brightness and the exposure. By lowering the brightness and decreasing the exposure, more specifically the black level correction, I was able to make the light blue sky have a darker blue hue. *Figure 2* below shows the difference between the original and the post-processed image.

Figure 2: Comparison bewteen the original image at 3,024 x 4,032-pixel (left) and the edited image at 675 x 900-pixel (right)

Overall, I like the outcome of my image. I feel that the clouds were captured nicely and clearly. I believed that I fulfilled my intent because I was able to show the contrast of the clouds and the sky. I also like that my processed image doesn't look too unrealistic and looks like it could possibly be captured in some crazy nature phenomena. The aspects that I would like to improve on would be the overall aesthetic. From looking at other cloud images I feel that incorporating a silhouette would make the clouds in the image stand out more. For future cloud images I will consider incorporating different kinds of silhouette, such as trees or mountains.

References

Skew-T Diagram: weather.uwyo.edu/upperair/sounding.html