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MCEN 4151

Clouds Assignment 2

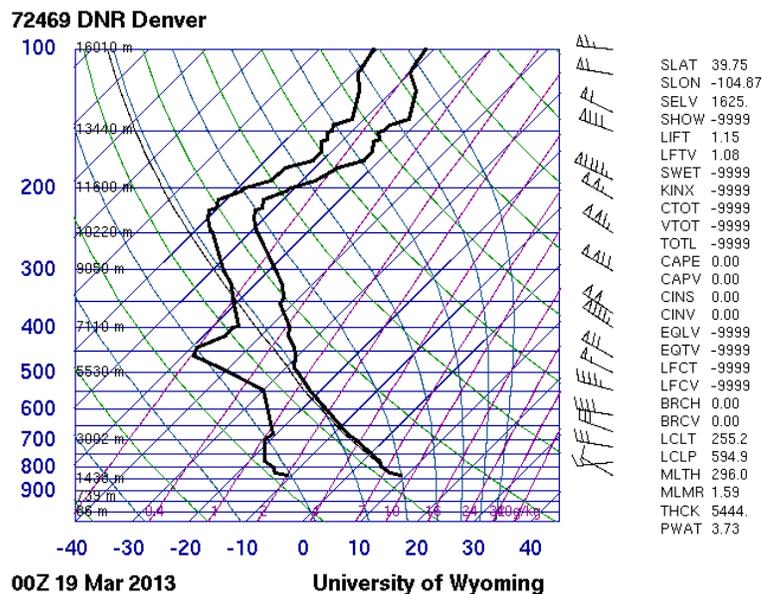
Professor Hertzberg

This picture was the second cloud assignment we had for the Flow Visualization class. The purpose of this was for us to observe clouds in our everyday and life, while also exploring the physics and fluid dynamics that develop unique characteristics of clouds. Different clouds are formed at different elevations. In addition, weather, atmospheric stability, and even terrain can affect the formation of different clouds. I believe Colorado, and Boulder in particular, is the perfect setting for observing different cloud types. Normally, I would look and observe clouds on a regular day, often walking through campus. For this assignment, I was lucky enough to capture a cloud picture from a different perspective. Although it is not the best image quality, it shows a unique image of clouds that cannot be seen by every day people. The original photo can be seen below:



This image was taken on March 19th on a Spring Break trip from Denver to Las Vegas. This time was approximately 2pm in the afternoon. It was unknown to me what elevation we were flying at. However, commercial airplanes fly anywhere from 30,000 – 50,000 feet in elevation. I was sitting towards the back of the plane and accidentally got part of the plane wing in the photo. In the end, I decided to leave it because it gives the viewer a perspective of where the photo was taken.

I believe that the clouds in this image are cumulonimbus clouds. Cumulonimbus clouds are normally found at high elevations such as this. They are also characterized by their large size and almost fluffy nature. From this angle and point of view you can see how far the cloud formation extends into horizon. In some cases, their formations can extend many miles. If we look at the skew t chart, we can get a better understanding of what the stability of the atmosphere was like, which will give us a further explanation of the cloud formation.



From this chart we can see that the possible elevation for cloud formation is about 12000 meters which equates to 36000 feet. That is in the range that was previously estimated earlier in this report. The CAPE value of 0.00 also indicates a stable atmosphere at this time.

While I was traveling, I saw the beautiful clouds outside the window of the airplane and thought it would be a great image to show to my peers. At the time, I did not have my camera on me so I was left with taking a picture with my Samsung Galaxy S3. No additional post processing techniques were used. Although not the best image quality, it provides a unique perspective of the clouds not ordinarily seen at ground level. The wing in the picture also gives a reference to the field of view for the photo. The wing is approximately 20 meters. Additionally, the view of the horizon in the background adds a lot of depth to the image to show how truly massive and beautiful these clouds are.

This image is unique because it gives a top down view of clouds that are normally thousands of feet above the ground. I like how it adds a different perspective than images taken from ground level. Additionally, the image appears to be a lot closer to the clouds which show off more detail, even with a camera phone. If I had the resources, it would be interesting to take more flights above clouds to take images with a high quality camera to capture some really compelling images.