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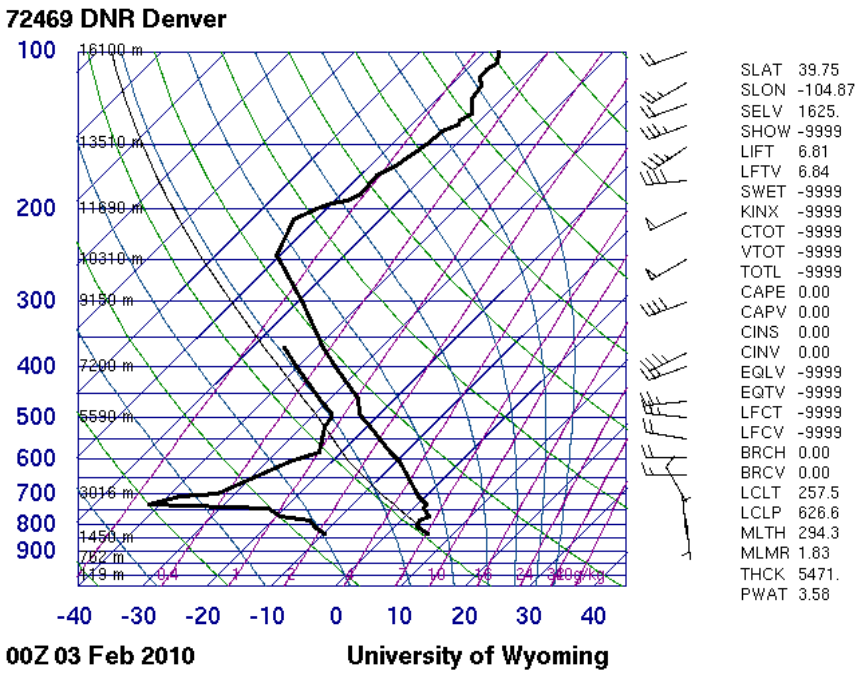
Clouds 2

In this report I will discuss my clouds 2 image. I chose the image that I did because I liked the colors and thought it had a very interesting shape. I had two other images that I considered using but I ultimately chose the one I did because of its unique and distinct shape. I have classified this cloud as a mountain wave cloud due to its lenticular shape. It is very interesting how the curvature appears to be opposite of what would be expected in a mountain wave cloud as the air is forced up over the mountains.

I took this image on February 2 at 5:23 pm. In front of the engineering center at the University of Colorado Boulder while looking north-west over the applied math building. My camera was elevated approximately 55 degrees from the horizon.

This image shows a clear representation of a mountain wave cloud. It is clearly defined by its lenticular shape. This is supported by the fact that the atmosphere was stable as seen in the skew-T plot shown below, as seen the cape value is 0. The atmosphere had also been stable before this and continued to be so after. This shows

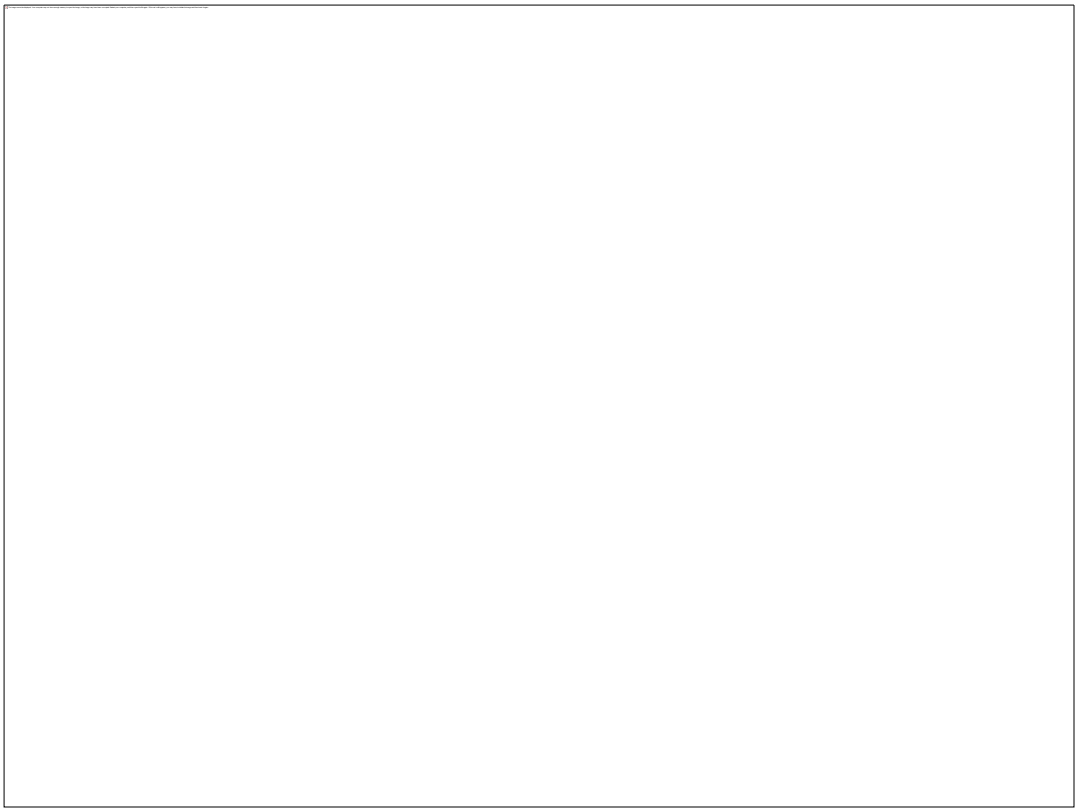
that there were no approaching fronts or expected weather changes. Based on the skew-T plot clouds could be expected upwards of 4000 meters. The most likely level for clouds based on the skew-T plot would be around 5500. This would appear a reasonable assumption since mountain wave clouds are altocumulus lenticularis and therefore can be expected at heights of starting at



around 4000 meters. This also would seem reasonable based on the fact that a cloud like this would be formed as it is forced up over the mountains, and in this case would have to clear the continental divide at around 4000 meters. Presumably it would have been a bit higher as it crossed over the mountains and as it moved away from the mountains it would have settled back down to a slightly lower altitude, which is where I managed to photograph it. I believe from my photograph and when I took the picture that the cloud was substantially lower than this, although this could be caused by the fact that there was a cloud layer, possibly stratus covering part of the sky which would make the cloud appear to be lower than it actually was. Normally with a mountain wave cloud you expect a convex upward facing lenticular shape because as warm moist air is pushed up over the mountains and condenses it forms a cloud and takes on a lenticular shape due to the shape of the mountain. This is because the cloud must be highest in the middle where the mountain is and usually is lower on the sides because it is descending from the colder air at higher altitudes. These clouds often conserve their shape even after they have moved away from the mountains. In my image this would appear to be the case, and it also appears to have a downward facing convex shape, which is not what would be expected. It is possible this is the case and that due to a local area of cooler ground the warmer air around it rose leaving it behind to form the shape seen in the picture. The other possibility is that at the time the picture was taken the sun was setting behind the Flatirons and causing the sunlight to slant upwards to hit the underside of the cloud. This effect may be providing us with an optical illusion making it appear to bubble downwards.

In order to capture this image I used my Cannon Powershot SX200 IS. The focal length was set to 5 mm with an F-stop value of f/3.4. The aperture was f/3.3 with a max aperture value of f/3.4. The shutter speed was 1/60 seconds with and ISO of 250. No flash was used, only the natural light, which is why the shutter speed it quite low since there were low light conditions. I will assume the skew-T plot is correct and the cloud had a height of 5500m. Assuming this and that my camera was at a 55 degree angle from the horizon the cloud would have been 6714 meters away from me. The original image was 4000 x 3000 pixels with a resolution of 180 pixels/inch. The final image was cropped down to 2909 x 1752 pixels with the same resolution.

In photoshop I used only some minor changes to slightly enhance my image. First if cropped a large portion of the image to focus solely on the cloud. By cropping I was able to remove distracting elements such as building and excessive trees. You can see how this helped enhance the image by viewing the original belowI left some tree branches in at the bottom and bottom left for composition and contrast purposes. I used the curves tool to enhance the contrast. I only darkened the image though since I was losing too much cloud definition when I increased the white side of the contrast range. I then used the Shadows/Highlights tool to changed shadows to 30% and highlights to 30%, this served to darken the image even more. I changed the master hue to +10 to make it slightly bluer and then increased both vibrance and saturation to +20 to enhance the colors a little more.



I like this image a lot. I feel that the initial image was decent, but I really like how I was able to focus on the cloud and enhance the image in photoshop. It was suggested that I should have cropped out all the trees but personally I love them, and left them in intentionally to add contrast and help with composition. It was also suggested I crop the top more because there was too much empty space. After going back over it I agree with this and would crop the top some to tighten the shot on the interesting lenticular shaped cloud. I wish the definition could have been a little sharper in the cloud itself. I also wish I knew if the shape of the cloud is an optical illusion caused by the lighting or if it is really shaped like that and if so why.