

This image was taken for the second cloud assignment on April 8<sup>th</sup> at 10:30 AM from the base of Folsom Field in Boulder, Colorado. I was facing to the West and tilted about 60 degrees upward. The particular cloud that I took a picture of was extremely isolated in the sky and appeared to be stationary. The most important consideration that led me to choose this image is the fact that this cloud was lightly defined, which gave it a somewhat ethereal feel, and gave me ample opportunity for editing and exploiting its more well-defined areas.

It was tough to classify exactly what type of cloud was captured in this image. By looking at the on-campus weather plots, it was evident that it was a relatively dry day and somewhat warm for early spring (in the low 60's). There was no precipitation anytime during the day or in any of the days before and after. There was little to no wind and high solar irradiance as well. None of these conditions would increase the likelihood of cloud formation.

So after this, I consulted the atmospheric sounding data. The skew-t diagram from that day is shown below in figure 1.

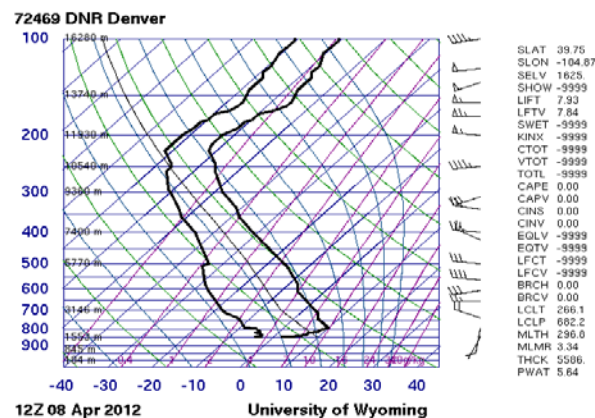


Figure 1

Based on the CAPE of 0, it was clear that the atmosphere was totally stable, and there were no potentially obvious altitudes for cloud formation. The texture of the cloud itself was wispy and 'cirrus-like.' Given the atmospheric and meteorological information (stable atmosphere, low humidity, no wind, and no impending weather change), this particular type of cloud seemed highly unlikely. Nevertheless, a 'cirrocumulus undulatus' appears to be present in the image.

After a closer look, I realized that there were likely two types of clouds in the image, because the cloud in front of the 'cirrocumulus undulatus' did not have nearly the same structure. I believe that this second cloud type was an altocumulus of some sort because of the stable atmospheric conditions. Furthermore, the fact that it was stationary further suggests that it may have been some variant of altocumulus lenticularis (or mountain wave cloud), which is a commonly seen cloud type in Boulder and in other mountainous regions. This type of cloud is caused by a process called 'orographic lift,' which produces a standing wave in the air. Due to the rapid change in altitude, descending air overshoots, and then overcools in an under-damped cycle. At the peaks of this standing wave, clouds become trapped, and remain stationary for significant periods of time. Typically, in Boulder, these clouds are oriented north to south, which was the case with the one captured in this photograph. These clouds often look like lenses (hence the name 'lenticularis'), but perhaps because of the other meteorological factors that day, this shape could not fully form. Nevertheless, I think there is a good chance that this cloud type is seen in the image.

The photo was taken using a Canon PowerShot SX130IS with a 5-mm focus. ISO-80 was used along with f/8 and 1/250 shutter speed. The only reason these aperture settings were chosen was to make the picture easier to take; there was plenty of light, so there was no reason not to go with a higher shutter speed in case my hand started shaking. The field of view was very large – using the light pole and the trees as reference points, the field of view of the raw image was likely around 100 feet by 100 feet.

The final image was heavily edited. Contrast was increased significantly, the color curves were altered to raise the level of blue, the image was cropped to only include the cloud, rotated 90 degrees counterclockwise, and then mirrored across the center. I felt the need to make these edits because I thought the original image was very plain, but also had a lot of exploitable qualities. For example, thanks to the formation of the lower altocumulus cloud, the edits make the image look like a headset, or a pair of earphones.

Ultimately, I feel very satisfied with the final product, but I believe that the editing improved the final quality of the image significantly. I wish I had kept taking pictures after the due date because a week or two after I took this photograph, the atmosphere became very unstable on a daily basis and yielded stunning clouds in the late afternoon. Nevertheless, my overall intent was fulfilled.

#### *Work Cited*

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3. Kirk, A. (n.d.). *Cloud Appreciation Society*. Retrieved 5 2, 2012, from <http://cloudappreciationsociety.org/collecting/andrew-kirk/>