Cloud Visualization Report 2:

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Figure 1. *Altocumulus mountain wave clouds being broken apart by turbulent wind currents during sunset on February 28, 2011 approximately 5:00 PM.*

Figure 1 is an example of an Altocumulus orographic ("mountain wave") cloud forming just east of the Flatirons located in Boulder, Colorado. The image was taken on February 28, 2011 at approximately 5:00 PM mountain standard time facing directly west in the backyard of a house located on S 46TH ST. The camera was handheld and tilted at an angle of approximately 15-20 degrees from horizontal.

The Altocumulus is a "mid-level" cloud forming at altitudes of around 6,500 to 18,000 feet above ground level. The formation is generally comprised of water droplets but may also contain ice crystals under certain circumstances. The Altocumulus orographic cloud is formed when air is forced to pass over an obstacle such as a mountain. As the air rises over the obstacle, it expands, causing the pressure and temperature to drop. As the temperature and pressure decrease, water molecules in the air begin to condense to form water droplets or ice crystals. These clouds are typically characterized by a stationary appearance meaning that even though air and water droplets are flowing through the cloud, the points where the water molecules condense and evaporate remain fixed.[1]

The Altocumulus orographic classification is justified by the examination of the skew-T plot shown in Figure 2. The atmospheric sounding was recorded at the Denver International Airport at approximately 6:00 PM mountain standard time for February 28, 2011. A quick assessment of the plot indicates that the atmosphere was thermodynamically stable during the sounding,

indicating that the most probable mechanism for the cloud formation seen in Figure 1 was due to orographic effects.

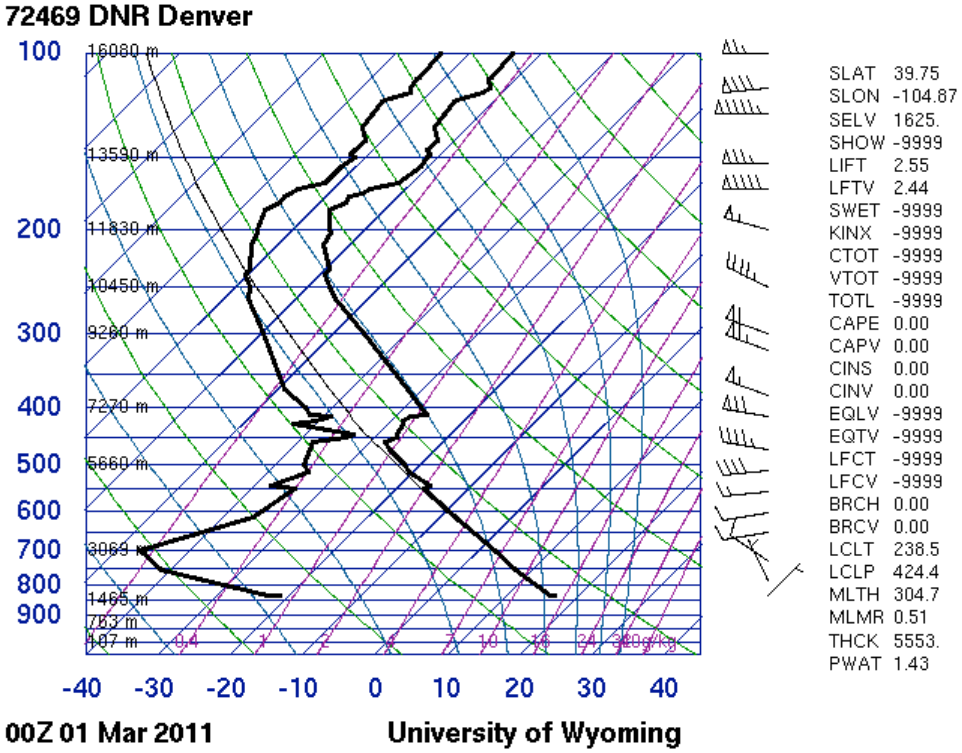

Figure 2. *Atmospheric Skew-T plot for the Denver Airport at 6:00PM MT standard time for February 28, 2011. Source: http://weather.uwyo.edu/upperair/sounding.html*

Figure 1 was taken with a Samsung NX-10 interchangeable lens digital camera featuring a 14.6-megapixel 23.4mm x 15.6mm APS-C CMOS imaging sensor producing a 4592 × 3056 pixel resolution image.[2] The image was captured using the full resolution capabilities of the camera and stored in the camera's RAW unprocessed image format. Exposure was 1/80 of a second at a focal length of 18mm, aperture of f/3.5, and a sensor sensitivity of ISO 100. Minor post-processing of the image was conducted using Pixelmator (http://www.pixelmator.com/) image editing software available for the Mac OS operating system. The image was subsequently under exposed and color boosted to highlight the multiple facets of the cloud interacting with the light rays of the sun and to silhouette the foreground objects seen at the bottom of the image. Leaving the foreground objects in the final image as an aesthetic choice made by the author in order to give it some sense of depth and scale.

The aspect that I find most appealing about this image is the surreal feeling I get from looking at the center of the cloud formation. It appears as if some mysterious object is descending through the clouds, twisting and churning them as it approaches the base of the formation. However, the engineering side of my brain simply tells me this is most likely due to turbulent wind layers beneath the base of the cloud, but it is still fun to imagine.

References:

1. Pretor-Pinney, Gavin, and Bill Sanderson. *The Cloudspotter's Guide: the Science, History, and Culture of Clouds*. New York: Berkley Pub. Group, 2006. Print.
2. Butler, Richard, and Simon Joinson. "Samsung NX10 Review: 2. Specifications: Digital Photography Review." *Digital Cameras: Digital Photography Review, News, Reviews, Forums, FAQ*. Mar. 2010. Web. 11 Feb. 2011. <http://www.dpreview.com/reviews/SamsungNX10/page2.asp>.