Report for first cloud assignment

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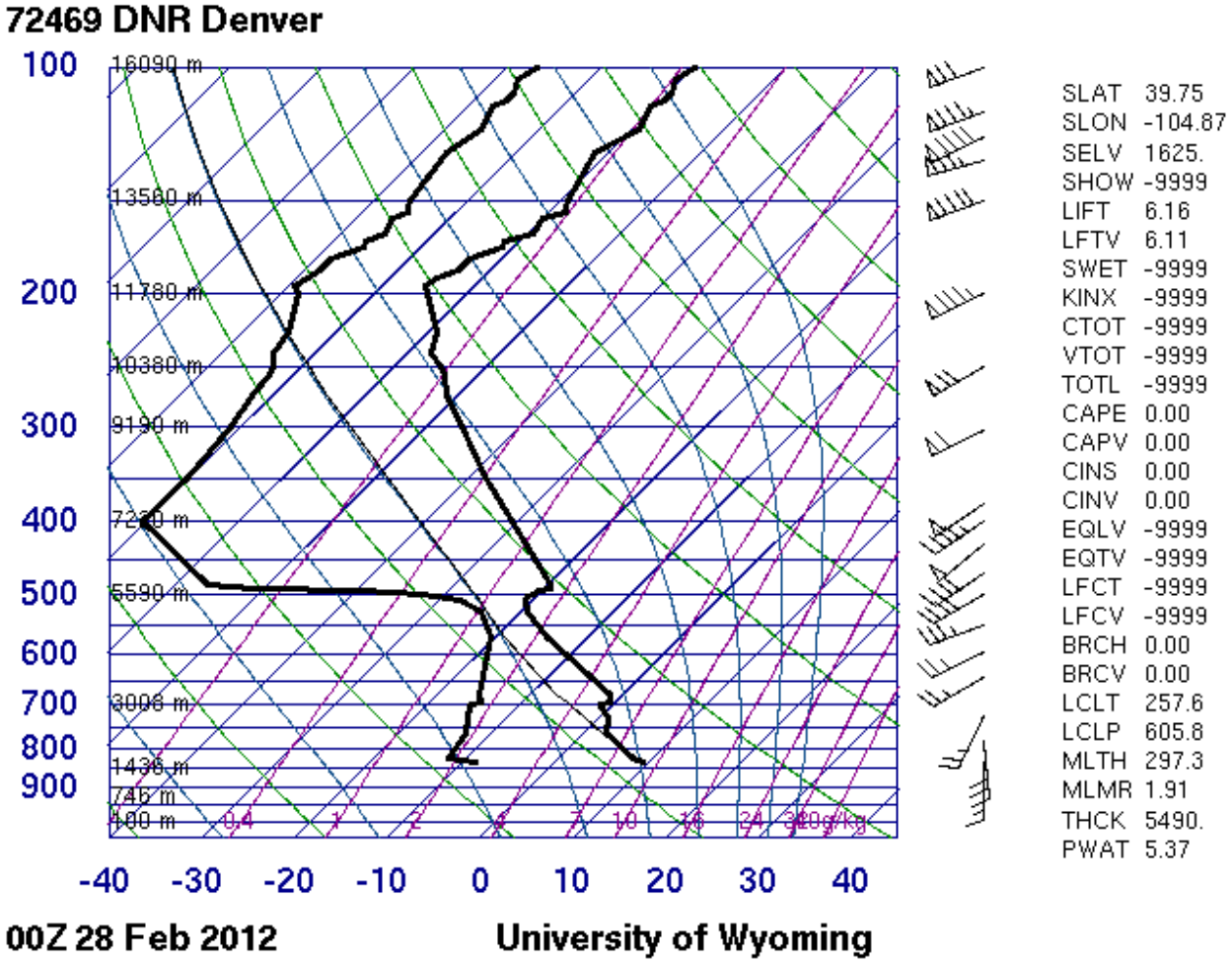
The clouds are seen every day and have been discussed in daily life. However, the type of the clouds, what kind of weather they represents, and what is the mechanism behind a specific could are not clear by many of us. The purpose of this image is to shoot a scene with clouds in it and then analyze the type of the cloud.

The image presented here was shot from the campus. It was about 2:00PM in the afternoon when the sun was just a little west off the center of the sky. The camera was held by hand and heading to the west. Due to the elevation of the clouds (higher than the mountains), the shooting

angle was about 40-50°. And this angle also avoided direct contact with the sun and protect the sensor in the camera. The image was taken in 02/27/2012.

Firstly, from the appearance of the clouds in the image, since they were discrete small pieces, fairly flat at the base, quite bumpy, and had cauliflower-shaped tops they could be a certain cumulus, they could be cumulus. Besides, the weather that day was sunny, which is the weather likely to have cumulus[1]. According to the skew-T plot that day[2], the atmosphere that day was dry beyond 5590m.



The closest location on the two thick black lines is at the elevation of about 4000m which is about 2.5miles. The clouds could occur between 2 to 3 miles are nimbostratus, altostratus, or cumulonimbus[3]. However, the nimbostratus is the sign for precipitation. By checking the

weather the day after that day, there was no rain at all. The CAPE data in the skew-T plot shows 0, which means the weather was stable that day[4]. So the clouds in the image couldn't be cumulonimbus. Besides, since the clouds in the image have cauliflower shape, are not layered and white in color, they are not altostratus. The clouds in the image apparently moved over the mountains while the rest of the sky was fairly empty. So the most possible type of clouds in the image should be mountain wave clouds. As the stable air flows over mountains, the atmospheric internal waves can create wave clouds. There was mild wind that day. So the shear force existed at the boundary of clouds. The clouds rotated under the shear force and broke up from the majority of the mountain wave clouds and formed the isolated clouds. Based on this analysis, the type of the clouds didn't match my expectation at the very beginning.

The size of the field of view is about 1mileX3miles based on the dimensions of the mountain below the clouds. The distance from the object to the lens should be 2.5 miles based on the skew-T plot that day where the clouds most likely to form. The focal length of the lens is 3.9mm. This image was captured by the camera on my iphone4. The pixels in width and height are 2592 and 1936, respectively. The shutter speed is 1/10000 second, the f number is f/2.8, and the ISO is 80. No flash light was used since the light of the sun was so sufficient for the image. The post-process was finished in the Photoshop. The first step was to adjust the levels. Then the brightness and contrast were adjusted. Followed by that, a brown color filter was added to make the sky darker and the color gradient more visible. The before image is shown in the following.

I really like this image since I am so obsessed by light travelling from the sun through the clouds. The strong contrast and the great light gradient are so amazing. However, pointing the camera directly to the sun was careless. The type of the clouds is not so easy to be identified even with the assistance of the skew-T plot. Next time when I take pictures of the clouds, I

would first try to identify the type of the clouds and take more detailed notes of the weather that day.

[1] http://cloudappreciationsociety.org/collecting/about-cloud-classifications/
[2] http://weather.uwyo.edu/upperair/sounding.html
[3] http://cloudappreciationsociety.org/collecting/
[4] http://weather.uwyo.edu/upperair/indices.html