

# Cloud Project 1

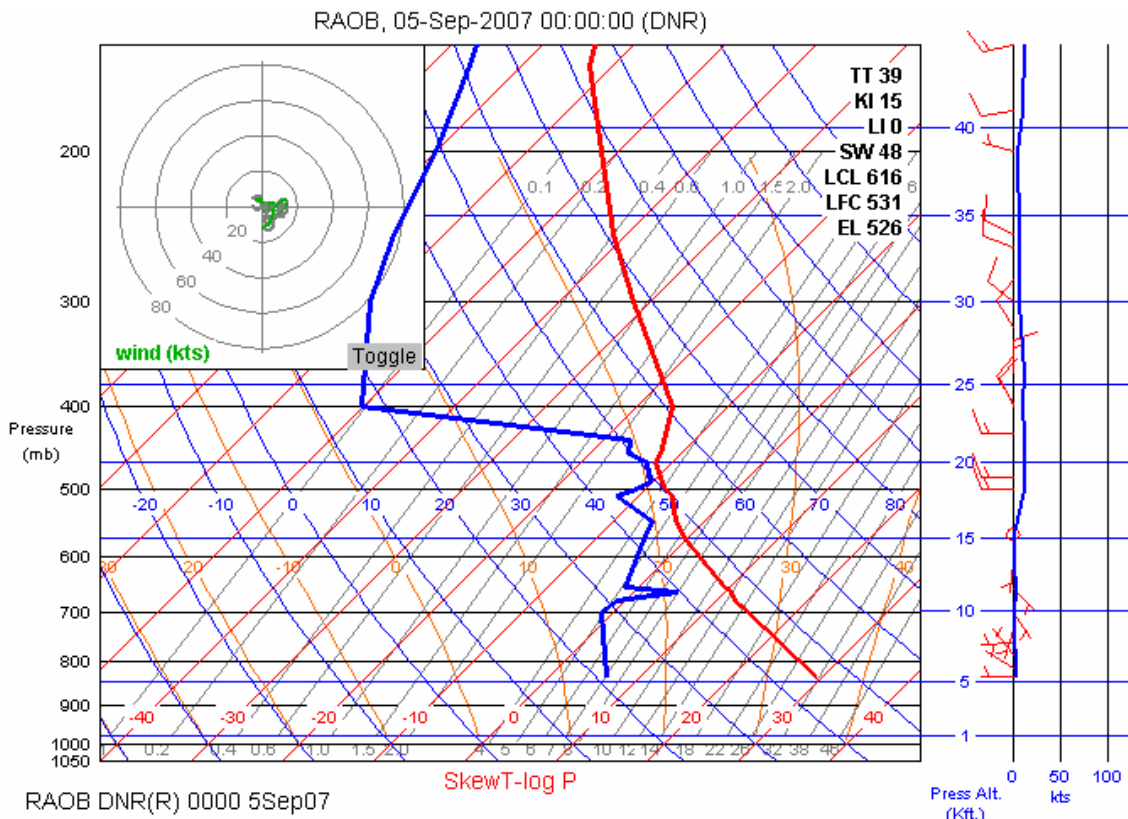
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MCEN 4228: Flow Visualization

The enclosed is a cumulus cloud photographed at sunset. While the cloud itself is rather common, the lighting gives the picture an interesting contrast between the blue sky and the deep orange hue of the cloud in the light of dusk. It appears that the cloud is falling and breaking up in the atmosphere, causing the many interesting shadows and colors. The photo was taken at 7:23 PM on September 4, 2007, looking southwest at 28<sup>th</sup> Street and Walnut in Boulder, Colorado.

The SkewT plot closest to the photo time of day is given in Figure 1. The adiabatic line is missing from the plot, but inquiries can still be made from the plot. Clouds are most likely forming at 18000 feet above sea level were the dew point is skewing towards the air temperature.



Most likely the cloud is falling downward from its current location in the stable atmosphere to the point where the dew point and the actual temperature are separating. This is causing the cloud to break up as it can not survive in the type of atmospheric conditions seen on this day below 18000 feet. Due to the cloud being at this lower level, it is classified as an altocumulus cloud. The wind at this point is approximately 10 knots coming directly from the west.

Using the focal length and the estimated height of the cloud above the ground elevation the size of the cloud is estimated at 7500 feet long on its longest axis. Due to the cloud being so far from the camera lens and only moving at 17 ft/s, the shutter speed of 1/125 seconds only allows the edge of the cloud to cross 4 pixels during the exposure. Further details of the photographic equipment and method are given in Table 1.

Table 1: Photo Properties	
Camera	Nikon D40x
Lens	Nikkor 18-200 mm VR
Resolution	10.2 MP
Distance from Lens	16000 feet
Local Length	38 mm
Aperture	f/5.6
ISO	100
Shutter Speed	1/125 sec

The lighting for the photo was entirely sunlight, with the sun sitting slightly south of the cloud on the horizon. The image was also edited in PhotoShop photo editing software to make it darker in order to compensate for overexposing the image. There was also a small fragment of a light pole in the original image that was removed in the bottom right corner.

The color contrast and texture of this photo make it interesting to look at even though the cloud itself is displaying characteristics that are common. A wide angle lens could have possibly increased the quality of the image, because there were many clouds at the time around this one displaying similar traits. Acquiring a picture without objects in the shot would be difficult, however, as the shot was taken over several buildings and trees. Additionally, the photo could be improved with a use of a lens filter to capture the true blueness of the sky, as the photo does not do it justice.