



Clouds Second Assignment

MCEN-5151 Flow-Visualization 2024

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12/14/2024

Cloud Type: Cirrocumulus

Cloud Date, Time, Location: 11/21/2024, 4:49 pm, Colorado Avenue at Folsom, Boulder, Colorado

Context and Purpose: This cloud picture was taken for my clouds second assignment. I was trying to click a cloud picture where the clouds are colorful (pink or golden toned) during a sunset. My purpose was to highlight the beauty and dynamic nature of clouds as they interact with light rays during a sunset.

Image Acquisition Details: The picture was taken at Colorado Avenue at Folsom, bus-stop on 21st November 2024 at 4:49 pm. The camera was facing towards north when I captured this image.

Cloud Physics: During sunrise and sunset, cirrocumulus clouds are mostly visible. Cirrocumulus clouds are high altitude clouds, present high up in the sky above 7000 m. Since, they are high in the sky, they get directly illuminated by scattered red and orange light from the sun during a sun-rise or a sunset, making them appear pink [1]. The skew-T plot reveals that the CAPE value is zero, which implies that the atmosphere is relatively stable with no rainfall during sunset and throughout the whole day. Additionally, it also shows that the temperature and dew point line become closer at 13,820 m, which implies that clouds are most likely to form at 13,820 m. The readings from the ceilometer on 21st Nov, 2024 at 4:49 pm reveals that clouds would form at a height closer to 20,000 ft. So, both the ceilometer data and the skew-T plot implies that there is a chance of high-altitude cloud type formation under stable atmospheric conditions. The clouds in the picture appears to have wisps around and are arranged in rows, and has texture as well, I can also see the blue sky around the clouds and these characteristics matches closely with a cirrocumulus cloud [2]. Additionally, cirrocumulus clouds form at a height of 5000-13000 m and the point where the temperature and dew point line in the skew-T plot comes closer to each other is approximately 13,820 ft so, it is closer to the range of the cloud height of cirrocumulus. Cirrocumulus clouds are formed when turbulent vertical currents through contrails meet a cirrus layer, creating some puffy cumulus shapes. They are made up of ice crystals and supercooled water droplets [3]. The thin, wispy nature of cirrocumulus clouds allows the scattered light to pass through them and colour them with red, orange wavelength to create a pink appearance and such pink appearance can also be seen in my cloud image.

Photographic Technique: I took this photo with my Iphone-15 pro. The lens has a focal length of 13 mm, aperture of f/2.2 with a field of view of 120. The original image width and height are 4032 px and 3024 px respectively. The final edited image has an image width of 3475 px and a height of 2108 px. The picture was shot with ISO 100, focal length of 35 mm, 0ev exposure, f/1.78 aperture and a shutter speed of 1/121s. For post processing, I have cropped the image, decreased contrast and enhanced sharpness to make the clouds more prominent.

Conclusion: The image reveals the beauty of pink clouds during a sunset. I like how the vibrant colours and the dynamic nature of clouds interact, that makes the photo mesmerizing. I think I was able to fulfill my intent of capturing pink clouds during sunset. However, I think it would have been better if I could erase out or take photo in such a way that the long black light towers did not appear in the photo.



Figure: Edited Image

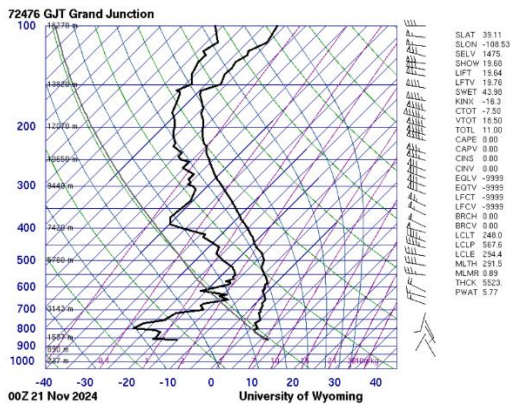


Figure: SkewT plot ([Wyoming Weather Web](#))

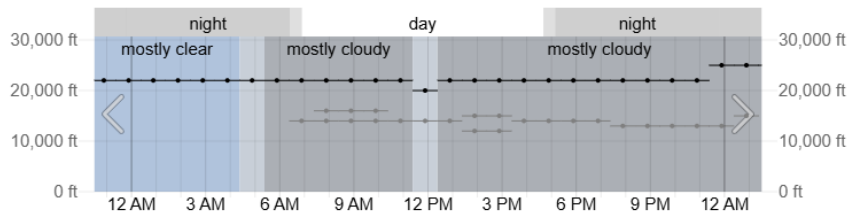


Figure: Cloud height on 11/21/2024, 4:49 pm, at Boulder, Colorado ([Boulder November 21 Weather, Average Temperature \(Colorado, United States\) - Weather Spark](#))



Figure: Original Image

References:

[1]. [The Color of Clouds | National Oceanic and Atmospheric Administration](#)

[2]. [cloud_identification_cards.pdf](#)

[3]. [Cirrocumulus clouds - Met Office](#)