

Group Delta - Project 3

Group Delta finished off the semester with an exercise going back to the basics. This time we decided to spare ourselves the trouble, and not even attempt 'plan A' of the wind-tunnel before moving on to 'plan B.' We concluded that the wind tunnel does not easily lend itself to photographing flows (the plexi-glass viewing window is scratched and holes in it are covered with duct-tape). With the wind tunnel once again ruled out, 'plan B' was to capture a fluid flow of smoke moving from laminar to turbulent.

A stable air environment inside a studio setting was pre-arranged. Two professional-quality, photo-strobe lights were set up facing a black paper backdrop. One light was fitted with a 'soft-box' directly facing the backdrop and the other light had a reflective umbrella attached and was pointed away from backdrop (to reflect soft light). The lights were used primarily as spotlights for my photos while my partners were able to use them as strobes for many of their photos. Dry ice was used for smoke due to its lack of harmful odor, zero residue, malleable nature (easily controlled and heavier than air), and photogenic qualities. A cup with hot water and dry ice was used to pour the sublimating carbon dioxide into a tube. The tube helped the flow of smoke become streamline and laminar.

The Field of view on this image is approximately 18 inches. Distance from object to lens was 3 to 4 feet. Image was captured at a focal length of 60 mm, an f-number of 4.8 and exposure time of 1/60 of a second (ISO was at 200). A Nikon D50 with a Nikkor lens was used freehand for all the flash photos while a tripod was used to capture time-resolved photos with no flash. Photoshop was used to rotate the image 90 degrees and adjust white balance for flash. Final image size is 2000 by 3008 pixels (2.63 MP).

Several methods of releasing the flow of smoke from the tube were experimented with; the most successful was to let the smoke freely flow down the tube at a steady angle. A steeper angle resulted in the smoke becoming turbulent sooner which was not expected. Many shallow-angled tests resulted in a slower, longer-lasting laminar flow; however the smoke would dissipate too quickly to capture the swirls and turbulent changes. A different backdrop with better light-absorbing qualities would have improved the quality of the image. The shadow cast from the flash is distracting; however the beautiful swirl from the initial undulation of the flow becoming turbulent makes it all worthwhile.