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FILM 4200

Group Project 1 Report

This was the first group project for the Flow Visualization course. Our group decided to capture images of smoke ring vortices.

The apparatus we used to create these smoke rings was a cardboard box approx. 1ft. x 1ft. x1ft., with a hole cut in it that was about 1.5 in. in diameter. The box was filled with smoke from a stage fog machine, and then the rings were created by tapping on the side of the box, forcing smoke out through the hole. The rings were photographed as they travelled in front of a black poster-board in order to better visualize them because they were relatively transparent. The rings were relatively 2 inches in diameter, but expanded steadily after they emerged from the hole.

The rings were visualized using thick smoke from a stage fog machine, and were then lit from overhead and behind by fluorescent lights. A black background was used so that the rings stood out better, and more details could be seen. This was done in a small room with no air conditioning on, so the surrounding atmosphere was relatively still and didn't affect the formation of the rings.

The size of the field of view is about 8in. x 5in., with the ring being approx. 2 in. in diameter. The distance from the object to lens is about 2 ft. The focal length of the lens is 18mm, and the picture was taken at f3.5, at 1/80 sec. shutter speed, at 1600 ISO. It was taken on a digital camera (Canon Rebel XS), and the original image

was 3888 x 2592 pixels. I decided to crop the image to 2832 x 1848 pixels because there was a lot of negative space on the left side of the photograph, and I wanted to cut it down to just the ring and the smoke trail behind it. I then used Photoshop to darken the image (in order to heighten details of the smoke) and then raise contrast (to separate background and subject). I chose to desaturate the image because I felt that color was distracting, and the smoke was meant to be white and the background black, so it made more sense to be colorless. Since the picture was taken at such a high ISO, I tried to use sharpen mask to increase details and lower the noise, but to little avail.

I am somewhat satisfied with the final image I produced because it was very hard to get a good focus on the rings due to the fact that the smoke was wispy, and they were moving in inconsistent paths. The one I captured has good detail, shape, and motion capture, but I did not realize until I looked at the image on a larger screen how noisy it was. This is my primary regret with this image. I would really like to do this again in order to better light the environment so that I can lower the ISO and get a clearer picture.