

Adolfo Castillo
Mischael Anilus
Lorenzo Salgado
Raul Pech-Figueroa

Fluids Project PIV: Team Mustangs



Figure 1: Geometry A (cylinder) and B (horse) used in the analysis

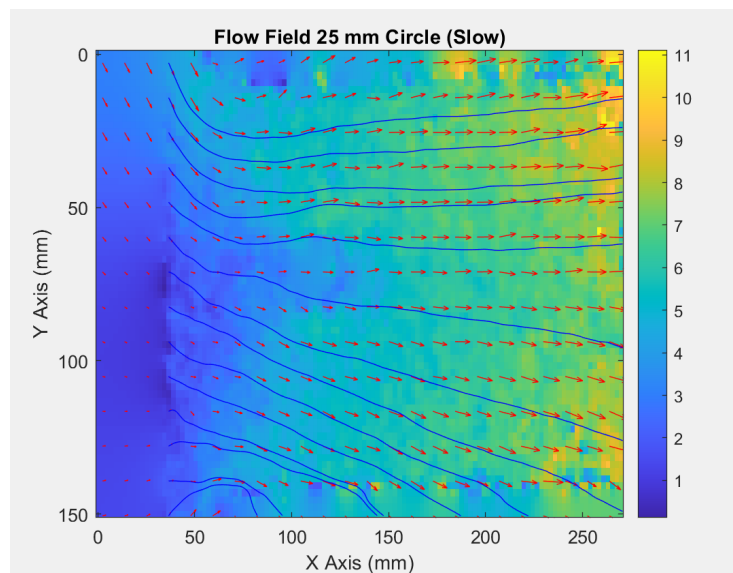


Figure 2: Mischael Anilus. Approximate mean flow speed: 1.2378 mm/s. Estimated Re: 26.63

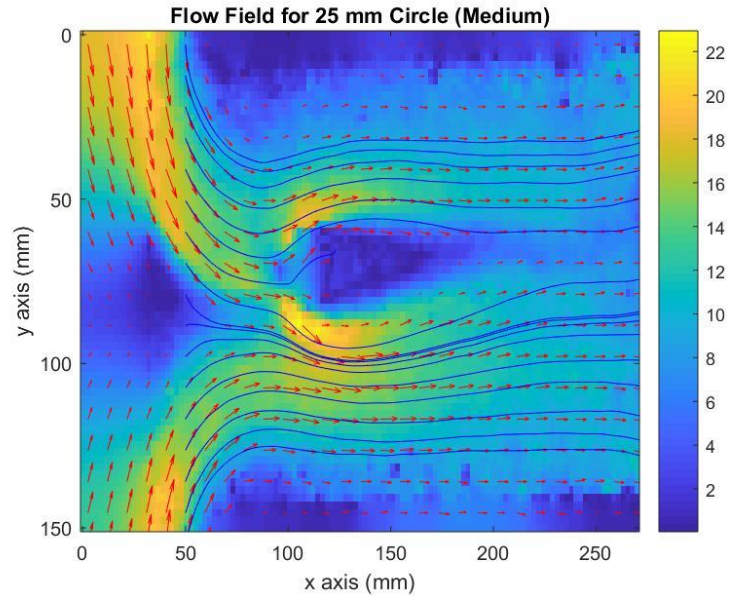


Figure 3: Raul Pech-Figueroa. Approximate mean flow speed: 2.80209 mm/s. Estimated Re: 60.291

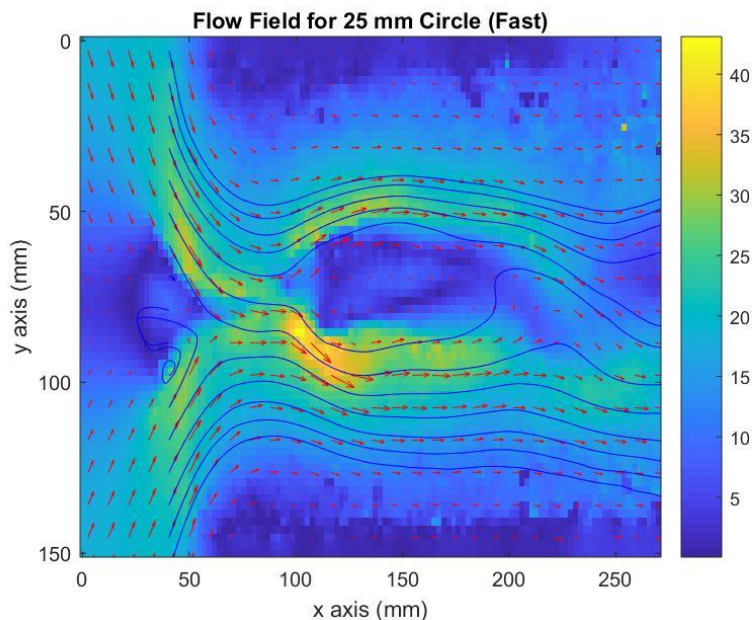


Figure 4: Lorenzo Salgado. Approximate mean flow speed: 3.5823 mm/s. Estimate Re: 77.08

1.1 Do you see separation of the flow from the cylinder or vortex shedding?

In the fast flow, it was much easier to see the reaction of the flow. There was separation of the flow from the cylinder as well as some vortex shedding starting to form down stream.

1.2 Does it correspond to what we learned in class in terms of the Re regime?

Yes, in high reynolds numbers, the flow will form vortex shedding and cause turbulent flow downstream from the cylinder. It also corresponds with the flow separating from the cylinder. Formation of stagnation points behind the cylinder were also observed.

1.3 How do your streamlines (qualitatively) compare to potential flow theory? Why?

As the boundary layer forms, the velocity field allows us to see the magnitude of flow speed as well as the direction about the boundary layer. PIV gives way to experimental observation of vortex shedding. It is clear to see the no-slip flow around the cylinder give way for the disruption of the uniform streamlines. However, as the flow continues along the horizontal direction of the object, we see the flow slowly "return" to uniform.

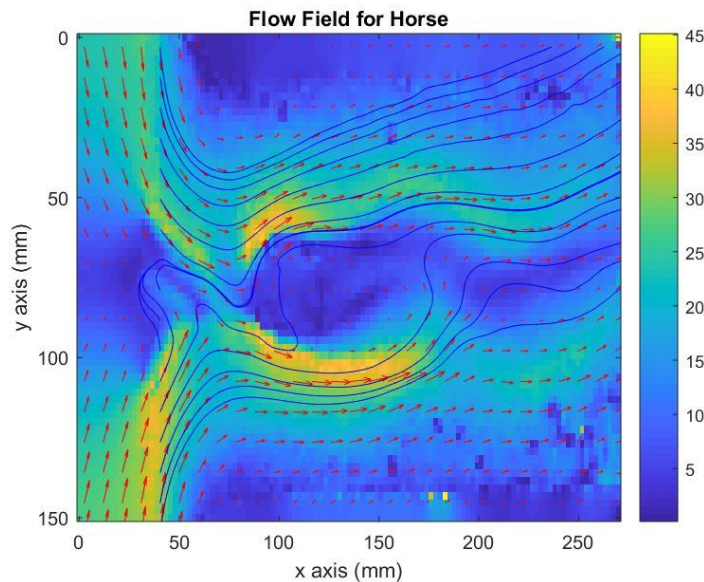


Figure 5: Adolfo Castillo. Approximate mean flow speed: 3.6133 mm/s. Estimate Re : 77.75

2.1 Why did you choose the object(s) you tested for Geometry B (any answer is acceptable)?

When Mischael and Adolfo met freshman year, Adolfo told Mischael that he had two horses back home. Mischael believed him since Adolfo is from Texas. Adolfo even gave them names - Chester and Mr. Apples. Adolfo didn't think Mischael had taken him seriously, so Chester and Mr. Apples were very real in Mischael's reality. This was until a fateful day in sophomore year when Mischael brought them back up. Adolfo had to break the unfortunate news that Chester and Mr. Apples did not really exist.

In the spirit of Chester and Mr. Apples, our group chose the name 'Mustangs'. This close respect to our ungulate friends serves as a form of giving thanks for our many pioneers and cowboys of our nation's storied history - a list that Adolfo would be a part of had Chester and Mr. Apples actually existed.

2.2 What do you observe/learn from examining the flow field around this object?

As the flow passed the horse, real stagnation points formed behind the horse. However, the flow above the horse, as the particles passed his head, moved very fast as they shot away from the shape of the horse. Looking back at the video and figures now, we should have placed the horse shape on one of the walls to simulate it running on the ground. We also saw quite a bit of vortex shedding from the PIV plots downstream from the horse.