

## Flume Demo Velocity Profile

**SPEAKER Rick Huizinga:** In this final flume demonstration for Lesson 5, we're actually going to construct a velocity profile using the flume. Now, the way that we're going to do that is by use of a pitot tube, which is simply a bent piece of tubing that is open to the velocity and it translates the flowing water into a velocity head above the water surface. Right now, you see that the tip of the pitot tube is at the bottom of the flume, and our scale on the right-hand side is reading in centimeters. This is a little easier for us to see it at this juncture.

So with the pitot tube tip at the very bottom of the flume, if we take a closer look at the meniscus, we can see that the reading there is about 104 or maybe 105 millimeters from the surface of the bed of the flume. If we take the tip of the pitot tube and raise it 2 centimeters or 20 millimeters and then we take a closer look at the meniscus again, we see there it is reading about 106 millimeters.

Now, if we take the tip of the pitot tube and raise it another two centimeters and take a closer look at the meniscus, we see that it is now 107 millimeters.

Once more, taking the pitot tube tip and moving it up another two centimeters, we take a closer look at the meniscus and we see that it is at about 107 millimeters again. It hasn't changed much from the previous reading, and that's because we have turbulent flow.

Now, if we move the tip of the pitot tube to eight centimeters from the bed and take a closer look at the meniscus, we see that it is still at about 107 millimeters.

Finally, if we take a reading just below the surface with the pitot tube, we then take a closer look at the meniscus and see that it is at still 107 millimeters.

Now if we take those readings and we translate them into a velocity from the velocity head reading that they are and plot them, we see that we have the non-parabolic shape of a turbulent velocity profile.

And this is the final flume demonstration for Lesson 5.