MAE 4273: EXPERIMENTAL FLUID DYNAMICS

Lab Report 2

Fall 2019

Cylinder Wake Survey

School of Mechanical and Aerospace Engineering

Oklahoma State University

October 21, 2019

ABSTRACT

The inclusion of obstacles in a flow field is a common occurrence in external flow scenarios and understanding the resulting disturbance is critical to measuring the induced drag coefficient. This lab examines the effect of a 2" PVC pipe (cylinder) spanning the entire *z* direction of the Oklahoma State University Endeavor Wind Tunnel. It looks at the flow quality in the cylinder's wake and determines the resulting drag force and drag coefficient by measuring differential pressure throughout sections of the cylinder's wake with a pitot static probe pressure transducer. The cylinder creates a flow disturbance wake most significant immediately behind the cylinder that depreciates further back as the flow smooths out. A drag force as high as 15N was calculated at a flow velocity of 30m/s as a result of the cylinder's induced wake. This cylinder disrupted the flow and higher levels of drag were induced at higher flow speeds and correspondingly higher Reynolds Numbers.

1. INTRODUCTION

External flow studies involve the introduction of an object or assembly that disrupts the initial flow conditions and paths. The flow disruption can provide engineering and physical benefits such as lift generated from an aircraft airfoil. Understanding the associated flow disruption allows induced drag to be quantified for a given shape at certain flow velocities, and therefore, Reynolds Numbers. Complex shapes may be impossible to analyze mathematically without the aid of computer simulations, and therefore the resulting drag force and drag coefficient may be best determined from experimental data in a wind tunnel.

Determining drag force from an object in an experimental setting can be accomplished in various ways. Nan discusses seven different methods including floating elements on water and oil baths or mechanical devices, load cells, and the Irwin sensor technique [1]. These methods each have their respective advantages including low cost, noise pollution, and ease of calibration but introduce complexities such as sensor sensitivity or facility requirements. None of the methods described include the pitot-static probe pressure measurements and drag force calculation that is presented in this lab. This paper discusses other techniques that could be used to validate and compare the data acquired from one method to another.

External flow testing can also be applied to models of larger-scaled objects such as an aircraft. Warrington explained dynamic similitude as a means to test various airfoils and their drag characteristics and the application to full-scale aircraft. The complications of such wind tunnel testing were also discussed including the induced drag from supporting structures of the model and instruments, as well as friction drag from the wind tunnel walls.

The objectives of this laboratory are as follows:

1. Calibrate and correct the pressure transducer for tunnel fan RPM speeds and the corresponding tunnel flow velocities
2. Measure the spanwise pressure differential behind the wake of a cylinder spanning the entire height of a wind tunnel (to mitigate three-dimensional flow effects) and further into and behind the wake of the initial position.
3. Calculate the induced drag of the wake
4. Calculate the resulting drag coefficient and compare the values to published data for the obtained range of Reynolds Numbers

2. EXPERIMENTAL ARRANGEMENTS

Materials:

This laboratory primarily used test equipment and did not measure samples, other than the air in the closed-circuit wind tunnel. Inside the tunnel, a 2" PVC pipe was installed in the *z* direction to span the entire height of the tunnel and create a two-dimensional flow field. The outer diameter of the pipe was 6cm. It was taped to the bottom of the tunnel and created a 0.25" ledge above the tunnel floor.

Facilities and Equipment:

The equipment used for this laboratory exercise was the Aerolab closed-circuit wind tunnel (Aerolab, LLC, Jessup, MD, USA) and LabView 2018 (National Instruments, Austin, TX, USA) software suite located in Endeavor 140 at Oklahoma State University. The tunnel is capable of fan speeds of 880 RPM to generate airflow velocities up to 133 km/h in a closed-loop system [1]. Due to the closed-loop nature of the tunnel, it utilizes a M1-3A refrigerant system (Advantage Engineering, Greenwood, IN, USA) to maintain the air at a constant temperature throughout wind tunnel operation. The test section features clear panes for viewing test articles and measures 1.22m in length (*x*-direction), 0.61m in depth (*y*-direction), and 0.61m in height (*z*-direction). Due to a manufacturer-installed load cell section that raised concerns about flow behavior, a portion of the tunnel was removed and replaced with an acrylic cover to maximize the test section volume and mitigate unwanted air flow patterns. The cover induces a slight cross-section change in the test section by ramping up at 6° from the test section entrance and ramping back down at the test section exit. This assembly with the pitot-static probe and 2" PVC pipe is shown in Figure 1.

The wind tunnel is controlled and operated by a virtual instrument (VI) coded in LabView that Aerolab provided with the tunnel. Their included traverse system is integrated into the VI and allows for motion control of an instrument (in this case, a pitot-static probe) inside the test section, and data acquisition during tunnel operation. This VI can be seen in Figure 2. The interface allows monitoring of the traverse and live data, as well as buttons for operating the tunnel and data acquisition on the far right. Data may be collected continuously or manually in bursts to record traverse position, fan RPM, static pressure, and many flow properties. These data are written to a .CSV file which can be opened in Excel and manipulated like any other spreadsheet for data analysis.

Experimental protocols:

This laboratory exercise involved running a matrix input for 12 different configurations: 8 fan speeds measuring the same *y*-*z* plane behind the PVC pipe at *x* = 22.3cm, 2 fan speeds closer to the cylinder in the *x*-direction at *x* = 18.4cm, and 2 fan speeds farthest from the PVC pipe in the *x*-direction at *x* = 36.8cm. These configurations are described in Table 1.

The pitot-static probe's initial position in the tunnel was recorded using cartesian coordinates in relation to the test section entrance ramp up (*x*-direction), far back wall of the wind tunnel test section (*y*-direction) and test section base (*z*-direction). Its initial location relative to the test section entrance and PVC pipe is shown below in Figure 3. With the tunnel fan turned off and zero airspeed, the ambient pressure was recorded from the Aerolab VI pressure transducer. The room temperature was recorded from the thermostat thermometer.

Beginning with 40 RPM fan speed control input via VI, the fan speed indicator was allowed to reach steady state, then a pre-programmed .CSV file was executed by the VI and traverse to record 100 samples at 2.5mm (0.1 inch) intervals through the *y*-direction. The probe spanning the *y*-*z* plane was to profile the side-to-side plane of the cylinder wake. This process is repeated in intervals of 100 RPM, up to 740 RPM.

To study the effect of cylinder wake in the *x*-direction, four additional runs were conducted, two at 140 RPM and two at 340 RPM. The first *x*-direction adjustment put the probe at 18.4cm behind the PVC pipe back edge, the second at 36.8cm behind the back edge. The same 2.5mm increments were evaluated by the traverse and probe. The configurations are listed in Table 1.

Calculated quantities:

The data of interest obtained from calibration and tunnel flow quality evaluation include model and dynamic pressure, and fan speed (RPM). Other parameters obtained from ambient conditions include $P_{air} = 97.56\ kPa$, $T_{air} = 295.93\ K$, and $R_g = 287.1\ \frac{J}{kg \cdot K}$.

The ideal gas equation is used to find density from air pressure *P*, the gas constant for air R_g, and air temperature, *T*.

$$\rho = \frac{P}{R_g T}$$

To obtain flow velocity from total and static pressure as measured by the pressure transducer and pitot-static probe, Bernoulli's equation is utilized where *P* is pressure, ρ is density, *V* is flow velocity, g is gravitational acceleration, and h is elevation. The equality between subscripts 1 and 2 indicate a conservation of energy between two states.

$$P_1 + \frac{1}{2}\rho V_1^2 + \rho g h_1 = P_2 + \frac{1}{2}\rho V_2^2 + \rho g h_2$$

Reducing the equation by eliminating the potential energy terms and assuming a $V_1 = 0\ m/s$ for total pressure yields:

$$V_2 = \sqrt{\frac{2(P_1 - P_2)}{\rho}}$$

Defining $P_1 = P_t$ for total pressure and $P_2 = P_s$ for static pressure, results in the following equation that allows for the calculation of flow velocity.

$$V_2 = \sqrt{\frac{2(P_t - P_s)}{\rho}}$$

For V as freestream velocity, x as test section length to pitot probe, and μ as dynamic viscosity, Reynolds Number is calculated by:

$$Re = \frac{\rho V x}{\mu}$$

Errors are found by dividing the difference of true and calculated values by the true value.

$$Error = \frac{true\ value - measured\ value}{true\ value}$$

For evaluating drag on the cylinder, the drag force is calculated as

$$D = \frac{1}{2}\rho V^2 A C_d$$

Given freestream and wake velocity data, the drag force is more practically calculated by using a drag integrand

$$D_{integrand} = \rho L(u(U_\infty - u))$$

and utilizing the trapezoidal integration rule

$$D = \int_a^b f(x)dx \approx (b-a)\cdot\frac{f(a)+f(b)}{2}$$

For determining the drag coefficient, C_d, A is the frontal area of the cylinder as viewed by the flow. Conversely, the equation may be rewritten to calculate C_d:

$$C_d = \frac{D}{\frac{1}{2}\rho V^2 A}$$

3. RESULTS AND DISCUSSION

3.1. Summary

This laboratory utilized calibrated pressure data to obtain velocity calculations in the wind tunnel and characterize the effect of a cylinder in terms of flow quality downstream of the cylinder obstruction.

The results indicate that wind tunnel flow disruptions exist as a result of the cylinder installed in the center of the flow field. Reductions in wake pressure and velocity are most prevalent directly behind the center of the cylinder. Furthermore, greater drag forces and turbulence exist closest to the cylinder in terms of downstream distance. Finally, flow disruptions are at their maximum for high freestream velocities and Reynolds numbers.

3.2. Pressure Transducer and Tunnel Fan RPM Calibrations

To begin this lab's data analysis, a MATLAB script [2] was largely written by Dr. Arvind Santhanakrishnan to automatically calculate values, analyze the raw data, and generate plots by calling upon the saved CSV files.

Initial conditions were defined for ambient temperature, pressure, air gas constant, and dynamic viscosity. The cylinder diameter and length were defined as well as an array for the RPMs studied. These RPMs are listed in Table 1. Other information from the data acquisition was also included such as the number of samples collected (100), and y-locations sampled (142).

Calibration terms were included that utilized findings from the first laboratory, namely the corrected pressure differential vs RPM slope value of 0.9496. The intercept is not included as to prevent the inclusion of negative numbers. Additionally, the freestream velocity equation slope was used to calculate the freestream velocity for a given wind tunnel fan speed. This slope value is 0.0186, but again, the intercept is not included.

At this point, the pressure transducer is calibrated, and the tunnel fan RPM can be associated with a freestream velocity. The ideal gas and Bernoulli's equations are used to calculate wake velocity, u, and its maximum value is used as the freestream speed, U_{inf}.

3.3. Wake Profiles

For analyzing wake profiles, plots were generated via the MATLAB script to examine how pressure, freestream velocity, wake velocity, drag force, and drag coefficient vary throughout the wind tunnel's cross section.

The first 8 configurations were taken at varying RPMs (40-740) with the probe at a constant x-distance of 22.9cm behind the cylinder trailing edge. These plots are shown in Figures 5-10.

Figure 5 plots wake pressure differential as a function of probe location spanwise across the tunnel and through the cylinder wake. It also provides the error that results from each sampling location. This figure indicates that at higher freestream velocities, the pressure suction effect of the cylinder is more pronounced and induces a greater pressure difference behind the cylinder. The error also fluctuates more in higher wake velocities. Figure 6 supports this statement as well by graphing freestream velocity as a function of the probe position. At the higher freestream speeds, the velocity differential becomes more significant with as much as a 10m/s reduction as a result of the cylinder obstructing the flow. Figure 7 agrees with this by plotting non-dimensional probe position and wake velocity as fractions of the tunnel width and freestream velocity, respectively. At the lowest observed Reynolds number of 3423, the difference between y and D and u and U_{inf} is the most significant. One can conclude that for low Reynolds numbers and flow velocities, the cylinder induces the greatest difference in wake and freestream velocities.

Figures 10-14 are plots for the pitot-static probe at an x-position of 18.4cm behind the cylinder trailing edge. This is closer to the cylinder and inside more of the generated wake. Similar to Figure 5, Figure 11 displays a greater wake pressure difference is created at higher freestream speed, with larger error values as well. This is further supported by Figure 12 that shows as much as a 7m/s reduction in measured wake velocity behind the cylinder at 14m/s freestream velocity. For both fan speeds, the non-dimensionalized wake velocity has the greatest difference from unity immediately behind the cylinder. One can conclude that for the probe closer to the cylinder, strong obstructions to the flow are also generated as a result of the cylinder.

Finally, an x-location farthest from the probe was selected at 36.8cm behind the cylinder to study how added downstream distance affects the wake flow recovery. Figures 15-19 are the same plots as previously but for data taken 36.8cm downstream. In Figure 15, a less significant pressure distance is observed than with the 18.4cm location. Figure 16 shows only a 3.5m/s reduction in wake velocity at 13m/s freestream velocity, *half* of that for the probe closest to the cylinder wake. There is less of a non-dimensional difference for this added downstream location as can be observed in Figure 17. Based upon these plots compared to the closest upstream location, the wake effects are less pronounced further downstream where the flow can coalesce, recover, and form a flow more similar to that prior to the obstruction. The calculated drag force and drag coefficient are described in the next subsection.

3.4. Drag Measurements

To calculate the drag force given pressure data, a drag force integrand was calculated in MATLAB and used in the trapezoidal numerical integration function. This method examines each step i and calculates the area between the two points as area under the curve to incrementally sum all areas and determine the total drag force at each probe location through the cylinder wake. Thereafter, the corresponding drag coefficient was calculated based upon the freestream speed (dynamic pressure) and drag force. These plots of drag vs Reynolds number are shown in Figures 8, 13, and 18. In each for a constant 140 or 340 RPM, the drag is directly proportional to distance downstream of the cylinder. For the nearest 18.4cm downstream distance, the drag at 340 RPM was determined to be 3.2N, then 3N, and finally 2.45N for the respective downstream locations. This shows the drag in the wake decreases the further from the cylinder the probe is located.

This observation can be extended to the drag coefficient. According to Tritton [3], the drag coefficient of a cylinder should generally decrease with increase Reynolds number. This is supported by the data obtained in this laboratory in Figures 9, 14, and 19. Figure 9 shows a decrease in C_D for an increase in Reynolds number. Figures 19 also exhibits such a decrease in C_D as well, although Figure 14 maintains a nearly constant drag coefficient. This is likely due to the close proximity to the cylinder trailing edge.

The experimental data appears to fit the published data reasonably well, although the data obtained in this laboratory covers a small range of Reynolds numbers and a direct validation is difficult to establish. A more robust study would include the very low and high extremes of Reynolds numbers.

3.5. Limitations

The primary assumption made in this study is that airflow is incompressible throughout all parts of the tunnel and therefore constant density during the tests. It was also assumed that air temperature outside the tunnel was identical to the air temperature inside being used during tests. The refrigerant system was also not enabled, so constant temperature throughout the lab experiment was also used.

A limitation was the inability to map velocities nearest the tunnel walls. The traverse had built-in displacement limits that prevented moving the probe within several centimeters of the walls. For this study, the flow nearest the walls was not as great of an interest as with the previous laboratory where boundary layer effects due to the tunnel walls were of interest.

The largest limitation however was the small number of observable Reynolds numbers in the tunnel. Reynolds numbers below 1000 and above 10^5 would allow for better validation of experimental data with published figures.

4. CONCLUSIONS

REFERENCES

[1] Patel, Havya. "Oklahoma State University Endeavor Lab Wind Tunnel Operations Manual." *Aerolab LLC*. June 13, 2018.
[2] Santhanakrishnan, Arvind. "Lab 2 MATLAB Script." Oklahoma State University. October 6, 2019.
[3] Tritton, D.J. *Physical Fluid Dynamics*. 2nd Edition. Oxford Science Publications. Clarendon Press. 1988. ISBN 978-0198544937.

TABLES

Configuration #	**Fan Speed**	**Probe *x* location**
1	40	22.9 cm
2	140	22.9 cm
3	240	22.9 cm
4	340	22.9 cm
5	440	22.9 cm
6	540	22.9 cm
7	640	22.9 cm
8	740	22.9 cm
9	140	18.4 cm
10	340	36.8 cm
11	140	36.8 cm
12	340	18.4 cm

Table 1: Configurations of Fan Speed and Probe Location Behind Wake in *x*-Direction.

FIGURES

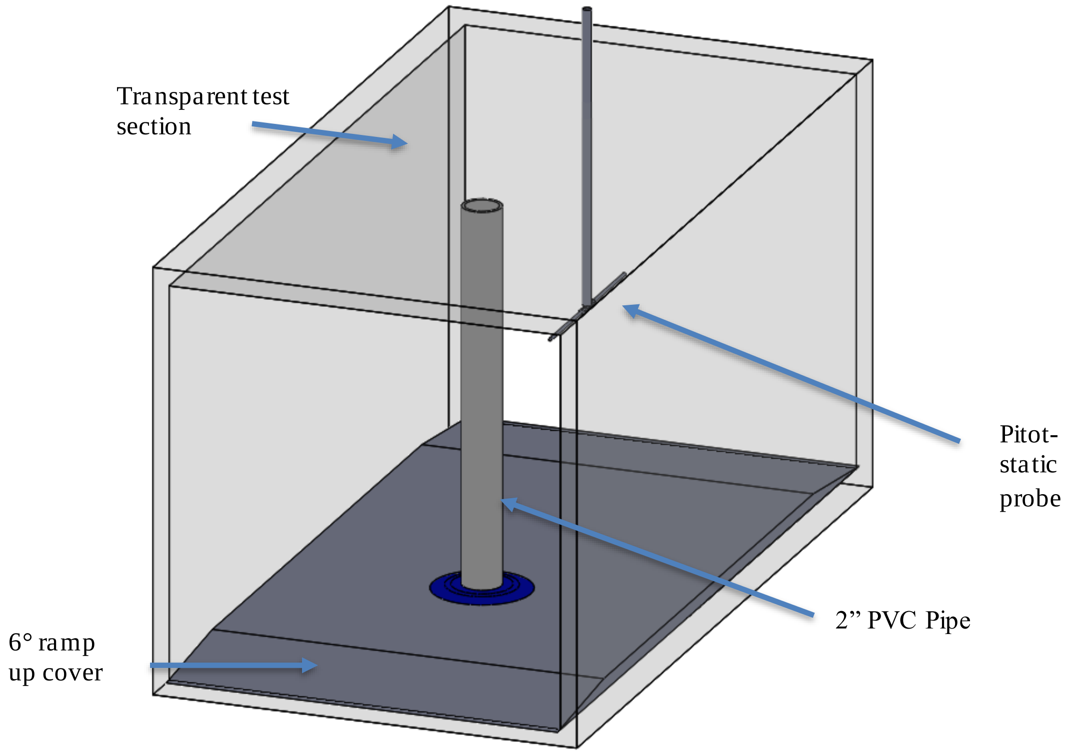

Figure 1: Wind Tunnel Assembly for Lab 2

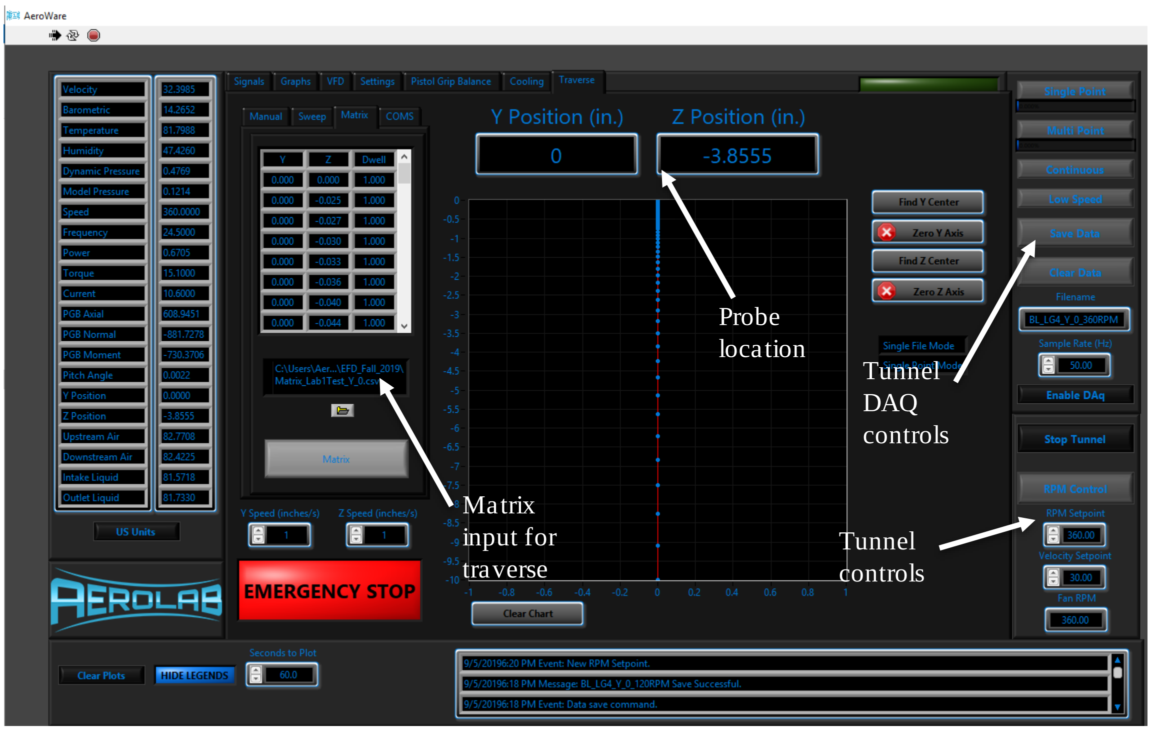

Figure 2: Screenshot of the Aerolab Wind Tunnel VI, with Buttons Labeled.

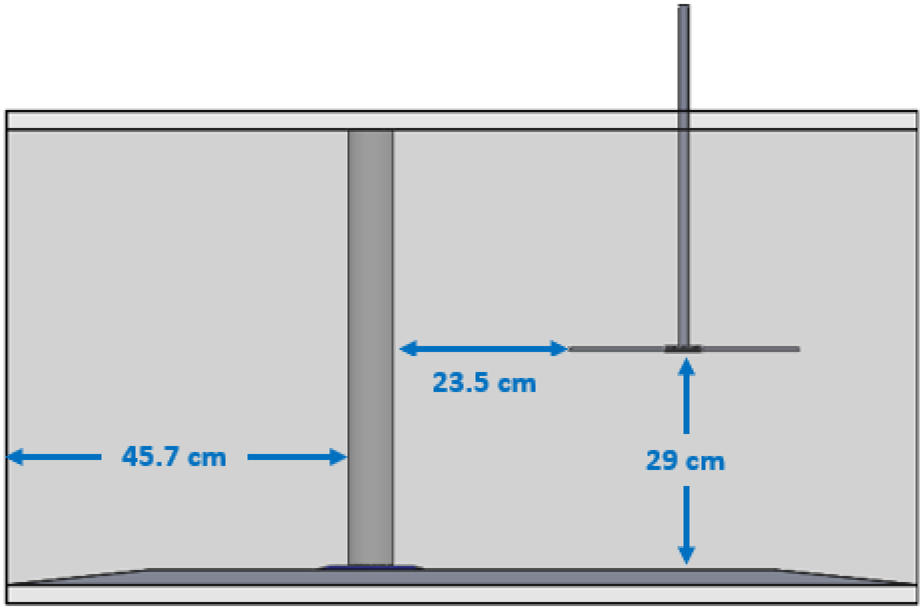

Figure 3: Test Section Side View Schematic of Initial Probe Location.

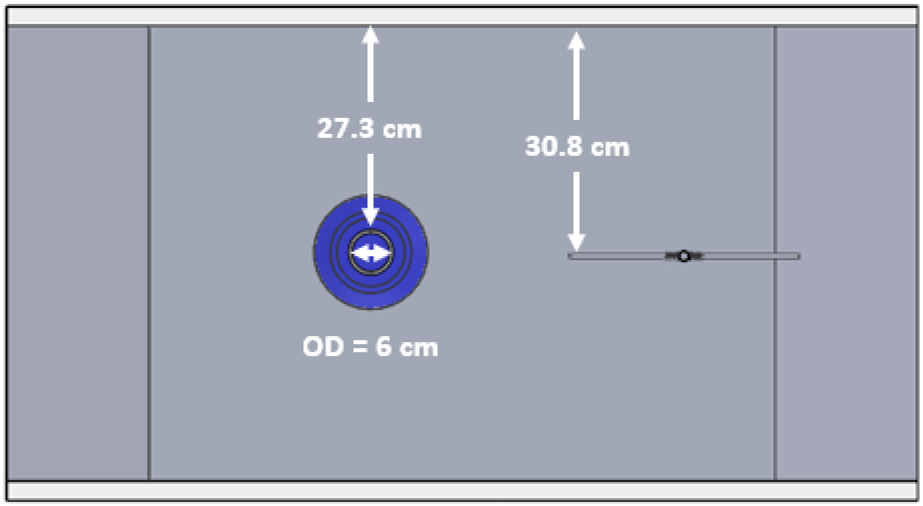

Figure 4: Test Section Top View Schematic of Initial Probe Location.

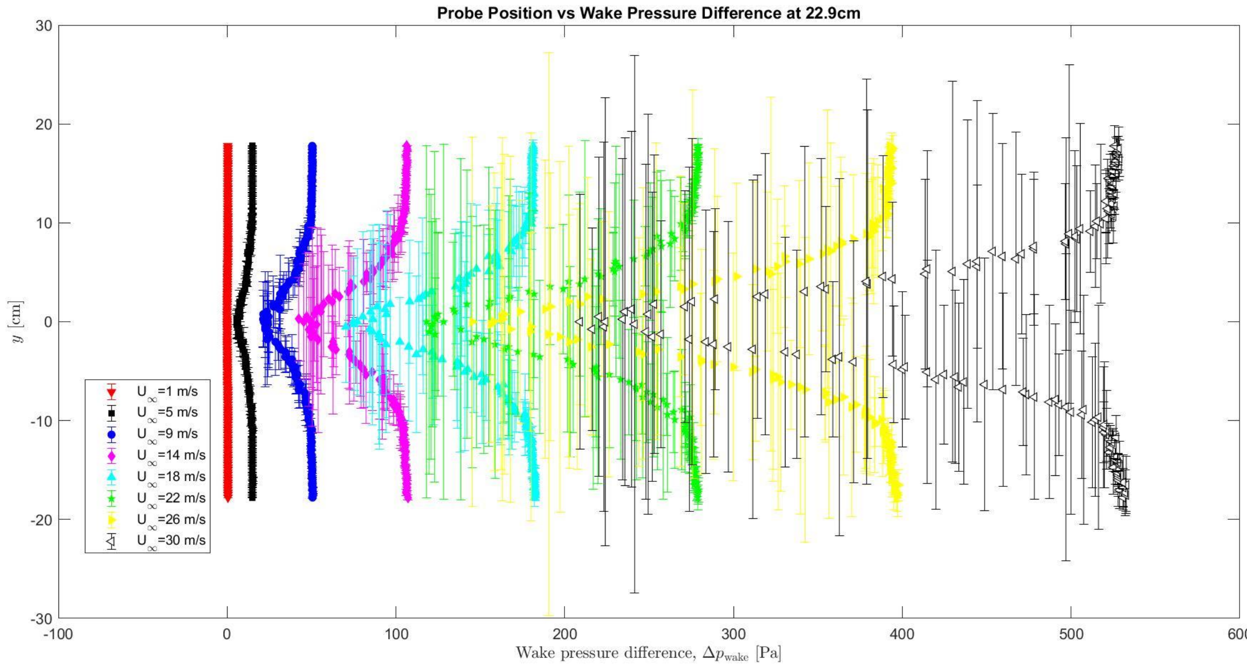

Figure 5: Probe location at 22.9cm behind the cylinder indicating increased pressure differential for higher freestream velocities. Overall error variation also increases at higher velocity.

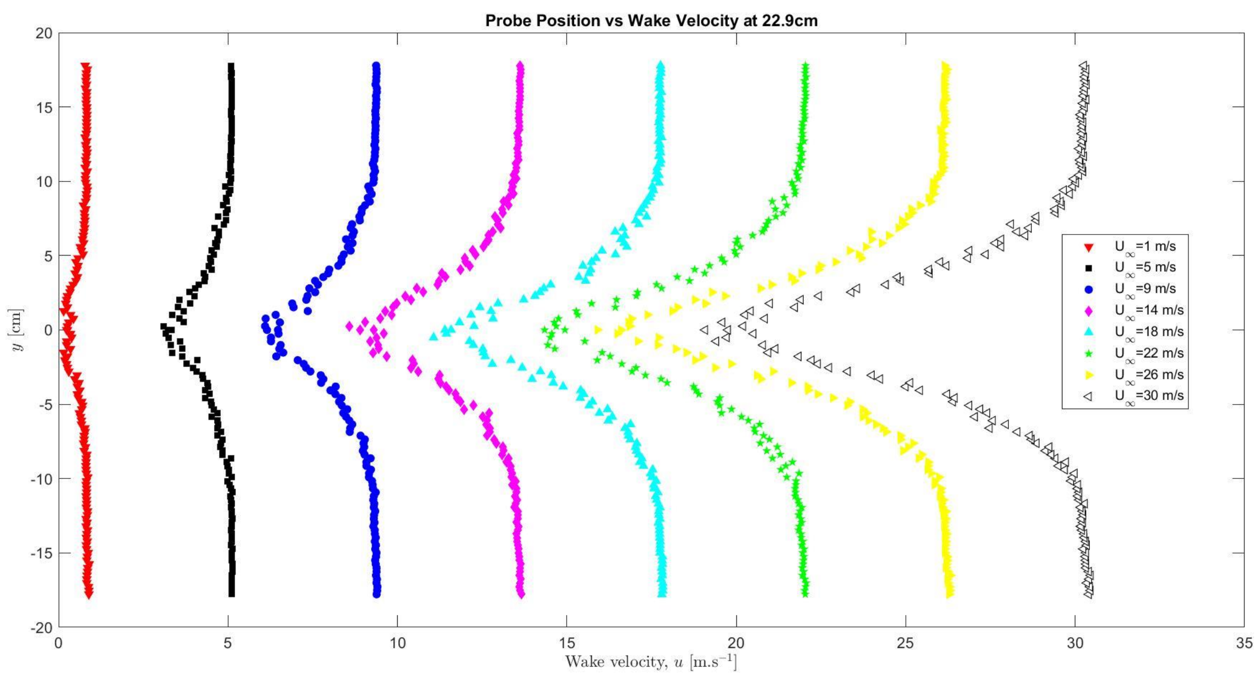

Figure 6: Probe location at 22.9cm behind the cylinder indicating increased wake velocity differential for higher freestream velocities. The reduced velocity is most pronounced behind the cylinder at the center of the tunnel.

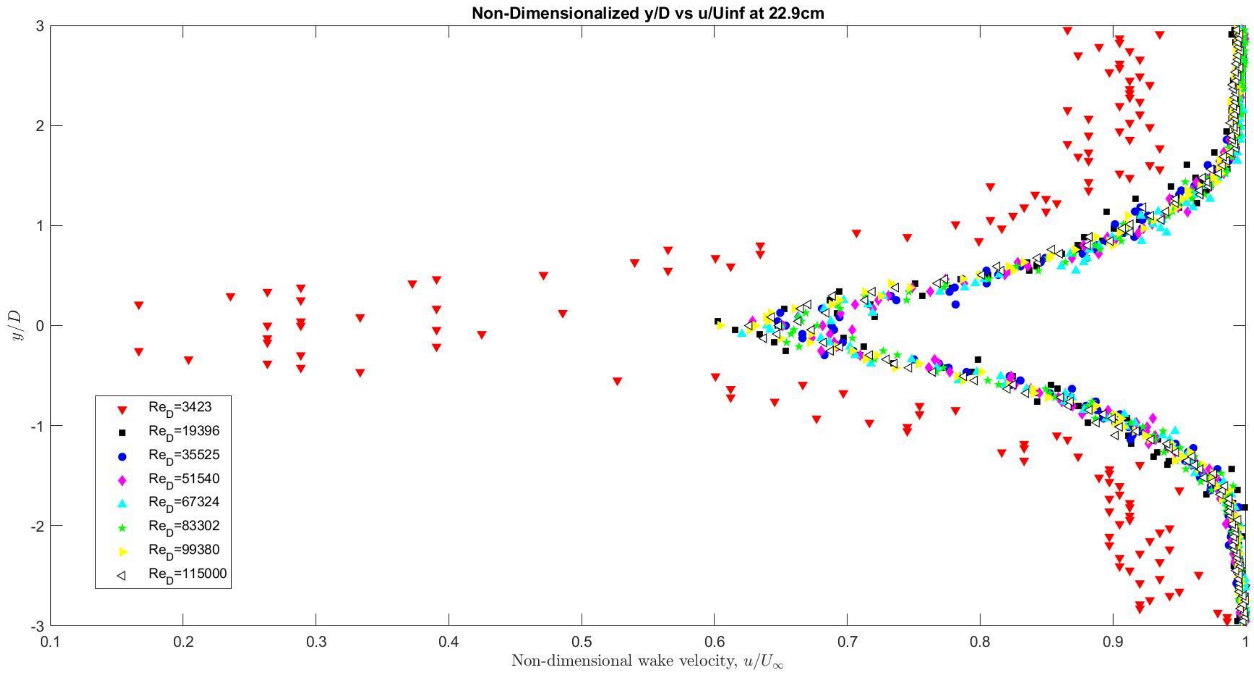

Figure 7: Probe location at 22.9cm behind the cylinder of non-dimensionalized probe position and wake velocity. At the lowest Reynolds number <5000, the cylinder has the greatest influence on the freestream speed as function of tunnel speed.

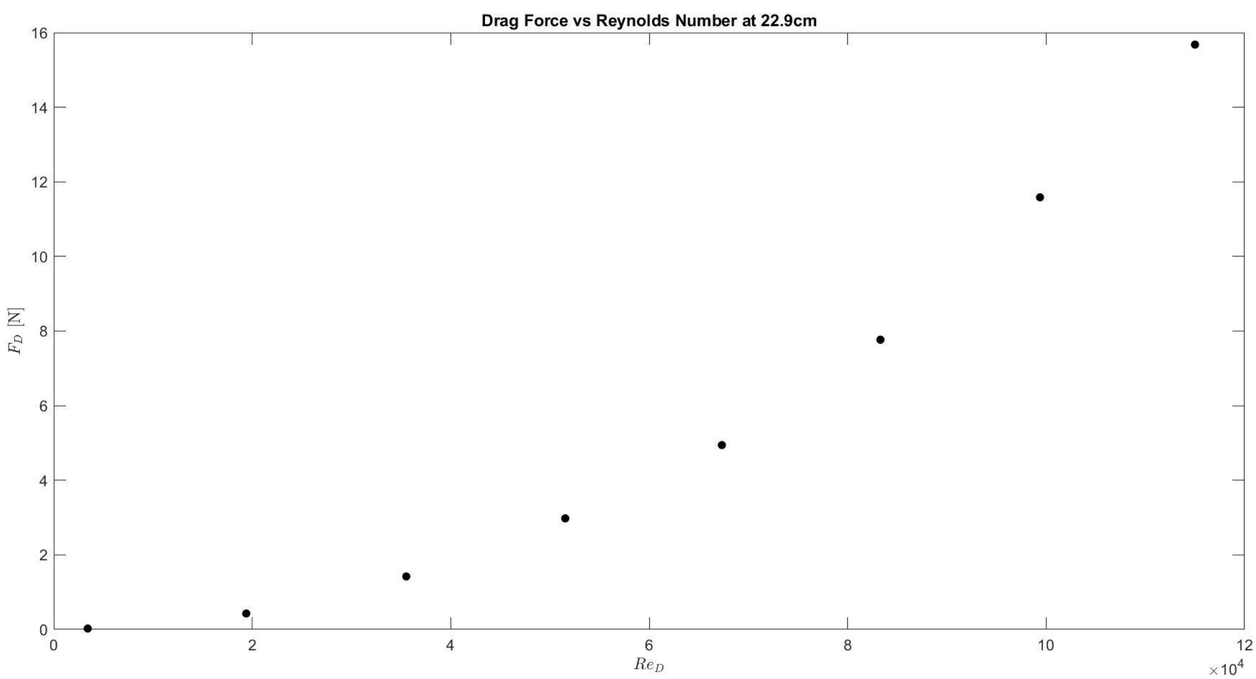

Figure 8: Probe location at 22.9cm behind the cylinder plotting drag force as a function of Reynolds number. The drag force experienced by the cylinder increases exponentially with increasing Reynolds number.

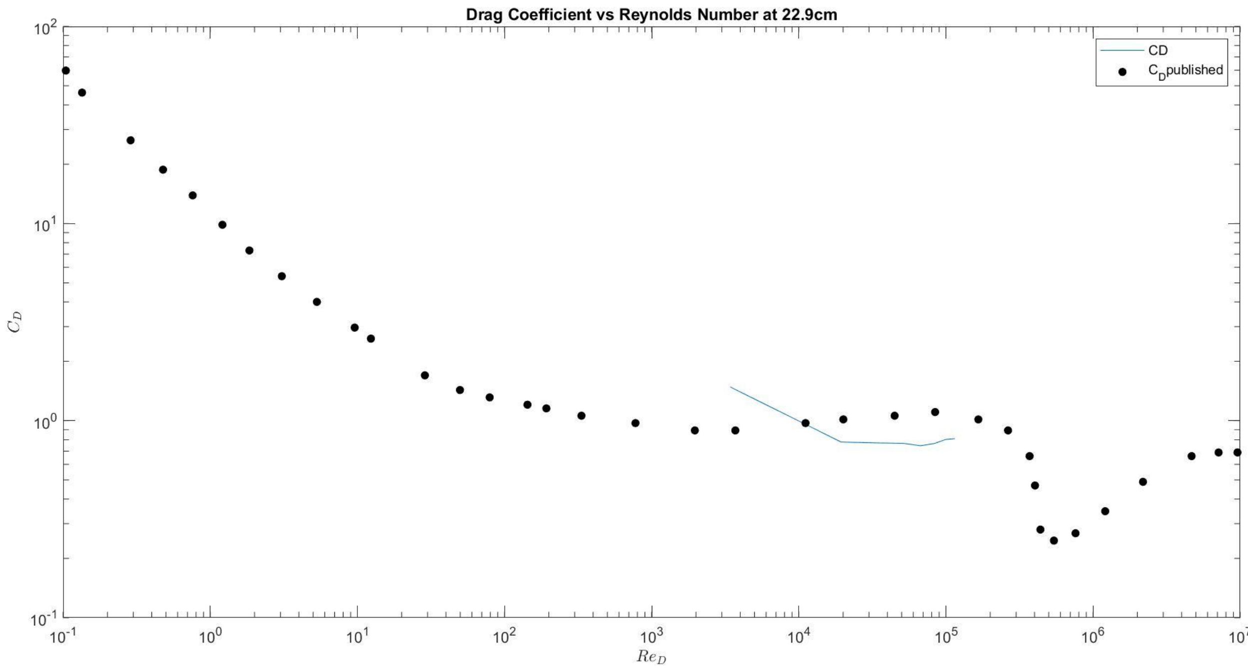

Figure 9: Probe location at 22.9cm behind the cylinder plotting drag coefficient as a function of Reynolds number. The black points are book-published values, while the blue line indicates the experimentally-obtained data from this lab. The data gathered covers a limited range of Reynolds numbers, but the range that does fit appears to fit published data reasonably well.

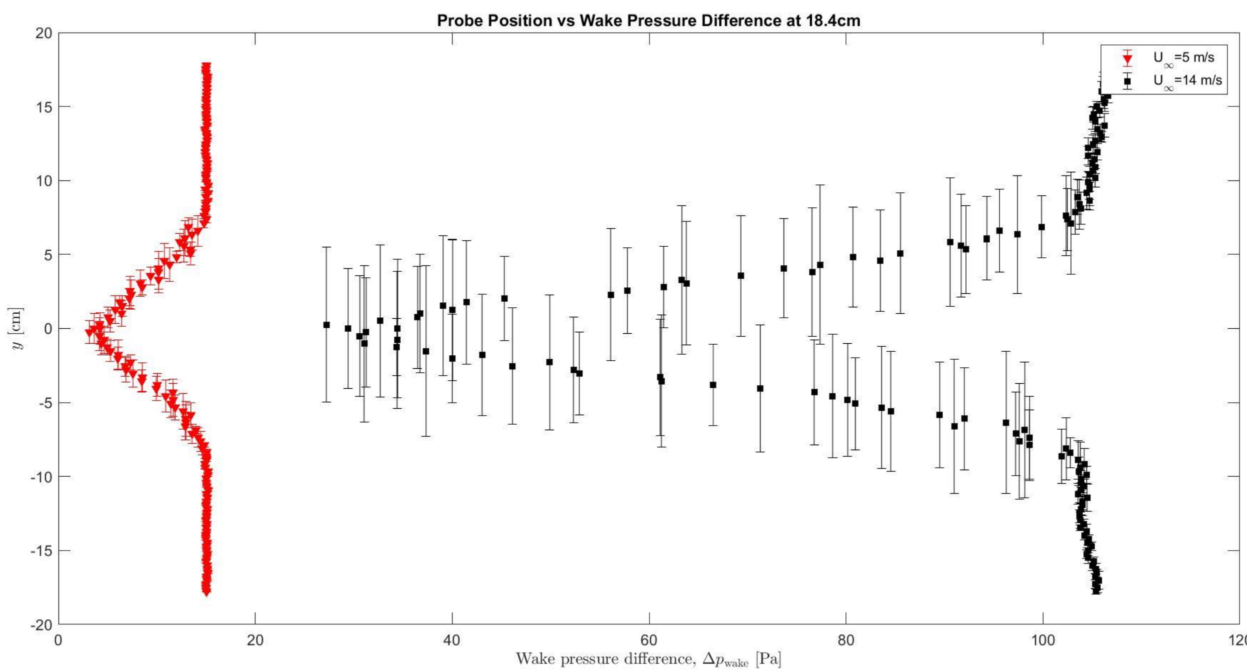

Figure 10: Probe location at 18.4cm behind the cylinder increased pressure differential for higher freestream velocities. Overall error variation also increases at higher velocity.

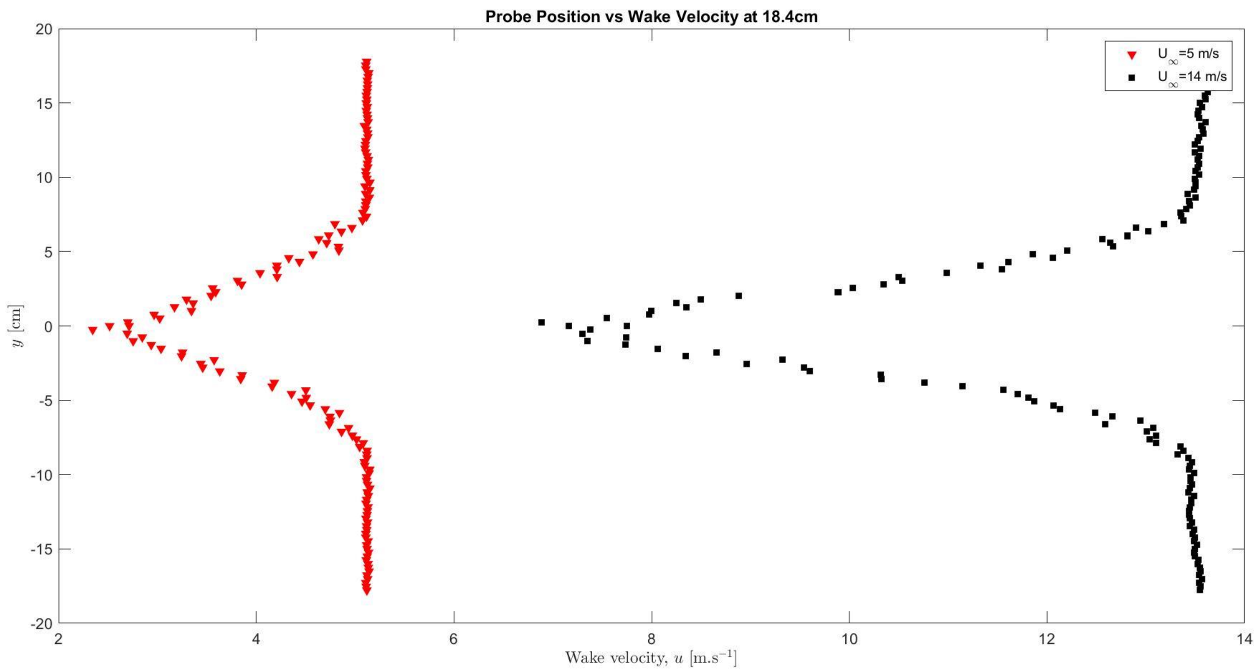

Figure 11: Probe location at 18.4cm behind the cylinder indicating increased wake velocity differential for higher freestream velocities. The reduced velocity is most pronounced behind the cylinder at the center of the tunnel.

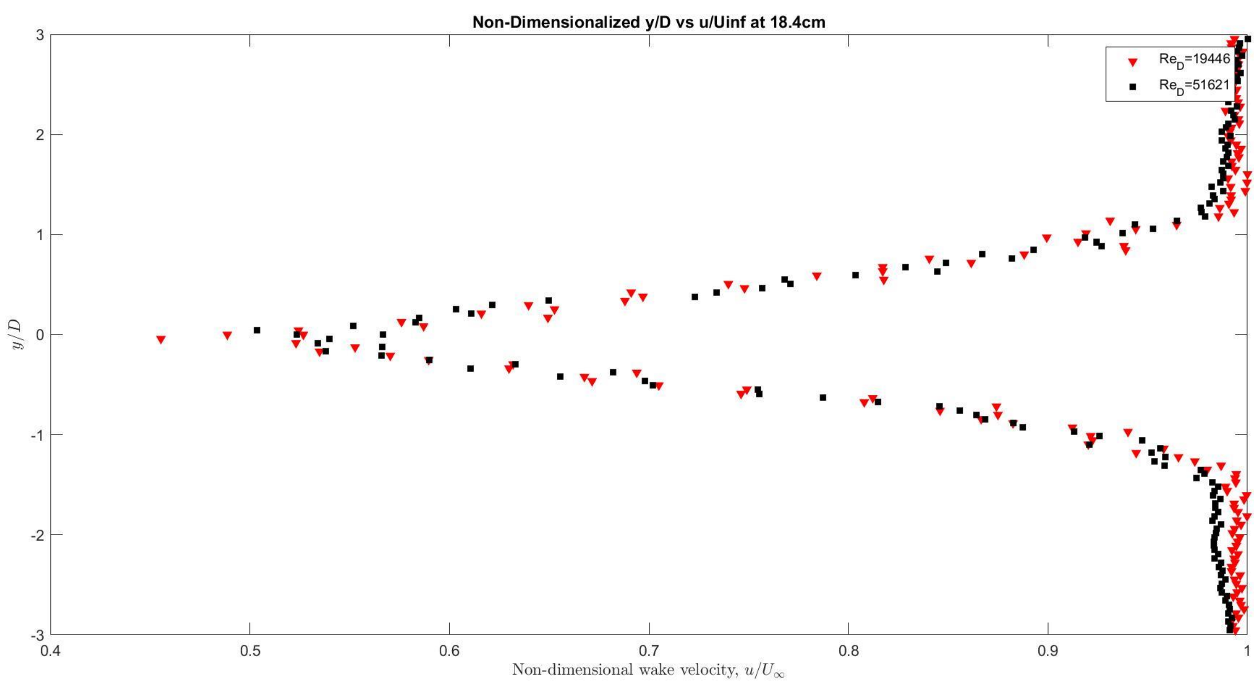

Figure 12: Probe location at 18.44cm behind the cylinder of non-dimensionalized probe position and wake velocity. For the two Reynolds numbers tested, the cylinder affects both by slowing the flow down immediately behind the cylinder.

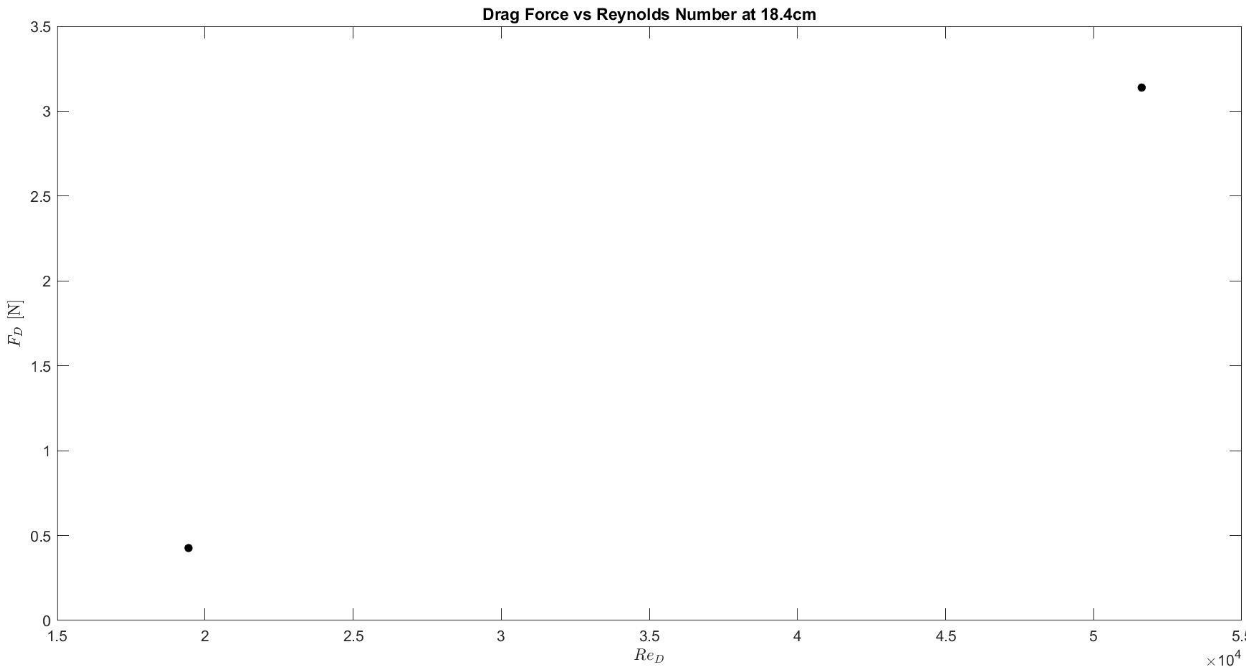

Figure 13: Probe location at 18.4cm behind the cylinder plotting drag force as a function of Reynolds number. The drag force experienced by the cylinder increases with increasing Reynolds number.

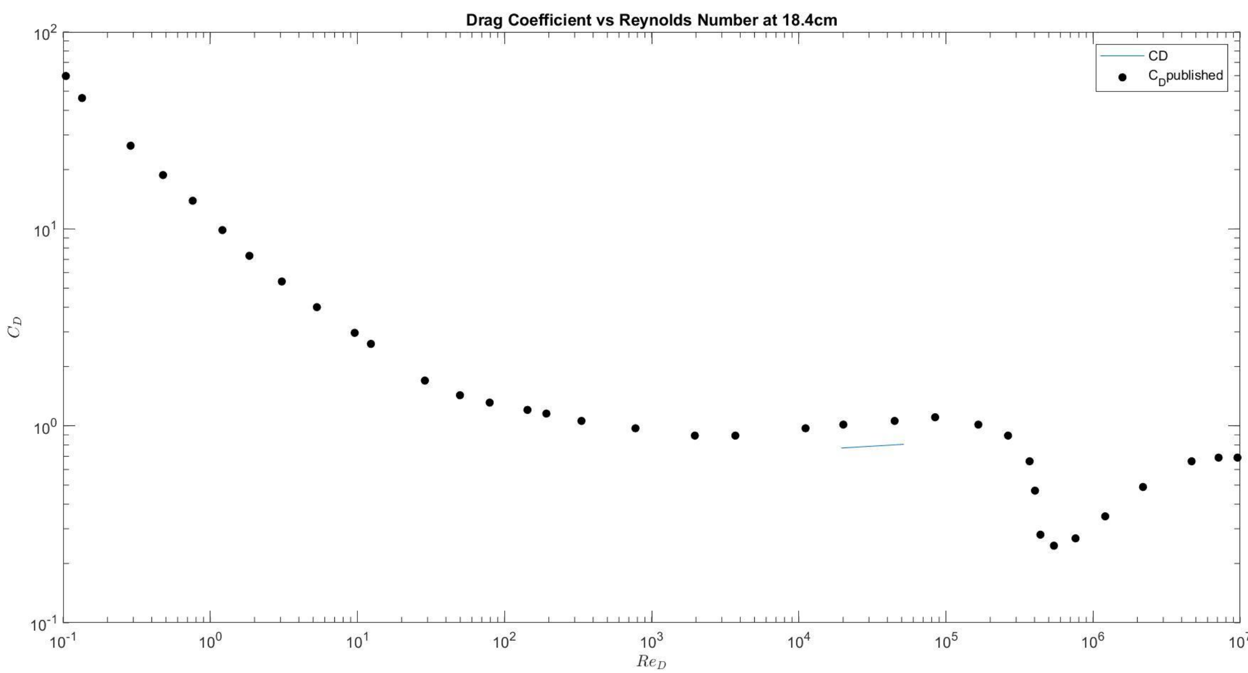

Figure 14: Probe location at 18.4cm behind the cylinder plotting drag coefficient as a function of Reynolds number. The black points are book-published values, while the blue line indicates the experimentally-obtained data from this lab. The data gathered covers a limited range of Reynolds numbers, but the range that does fit appears to fit published data reasonably well for being closer to the cylinder than at 22.9cm.

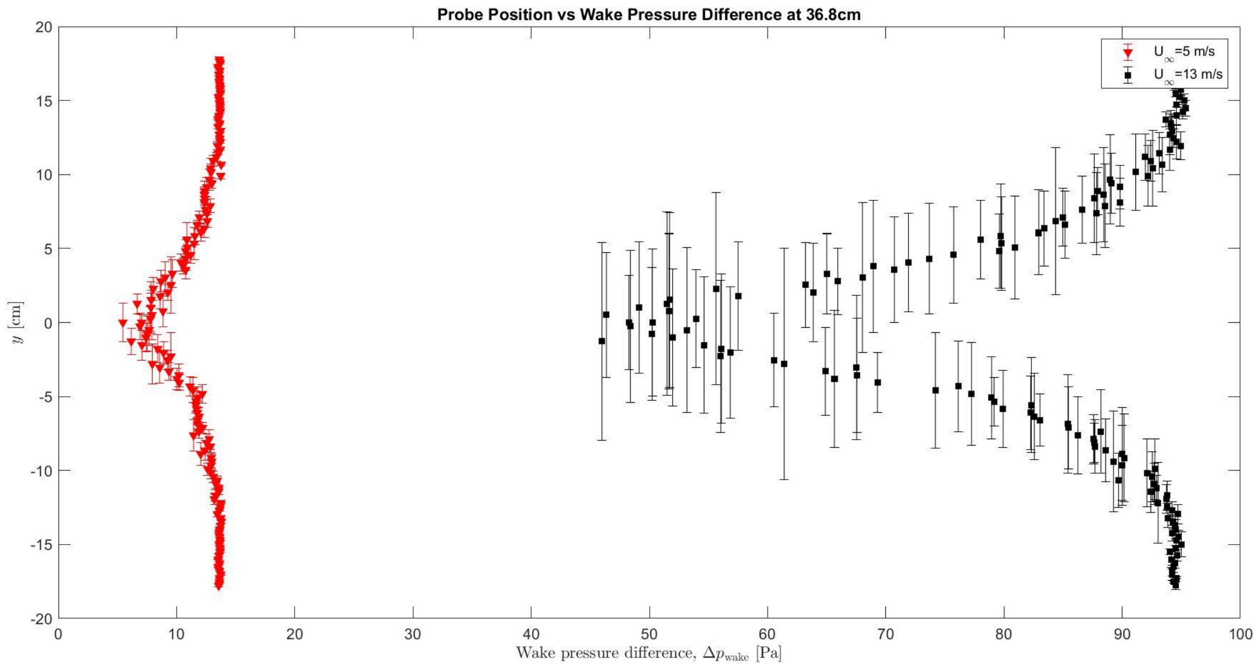

Figure 15: Probe location at 36.8cm behind the cylinder increased pressure differential for higher freestream velocities. Overall error variation also increases at higher velocity.

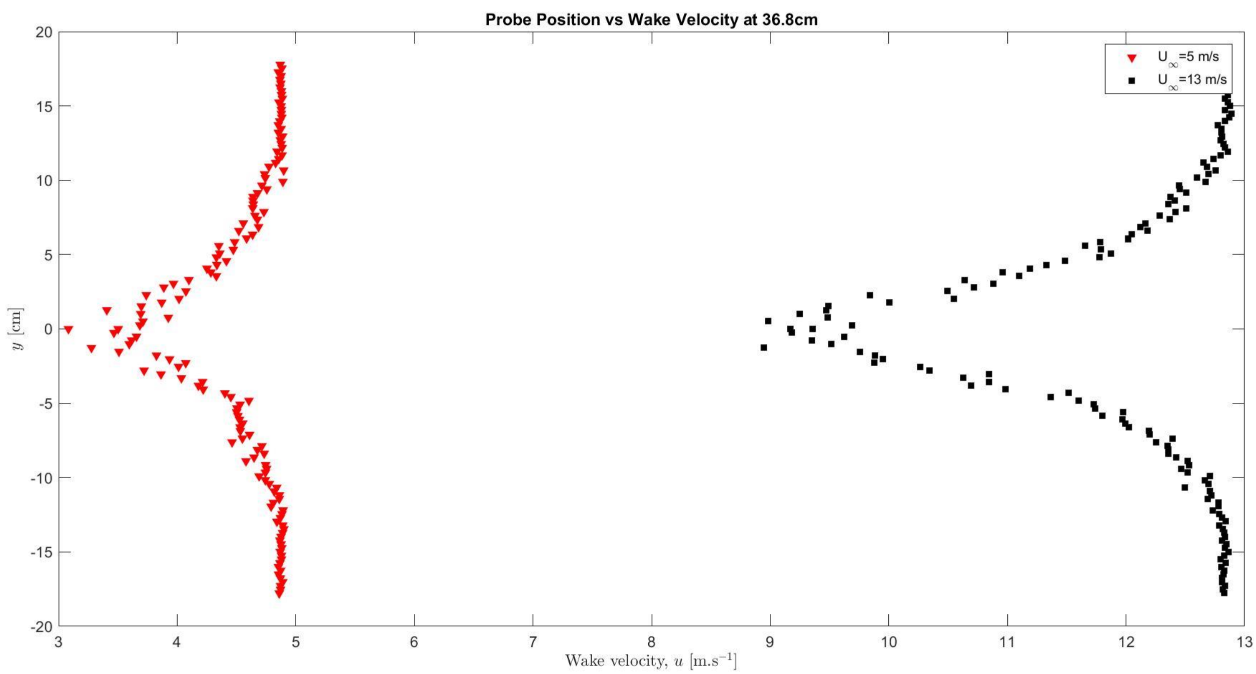

Figure 16: Probe location at 36.8cm behind the cylinder indicating increased wake velocity differential for higher freestream velocities. The reduced velocity is most pronounced behind the cylinder at the center of the tunnel.

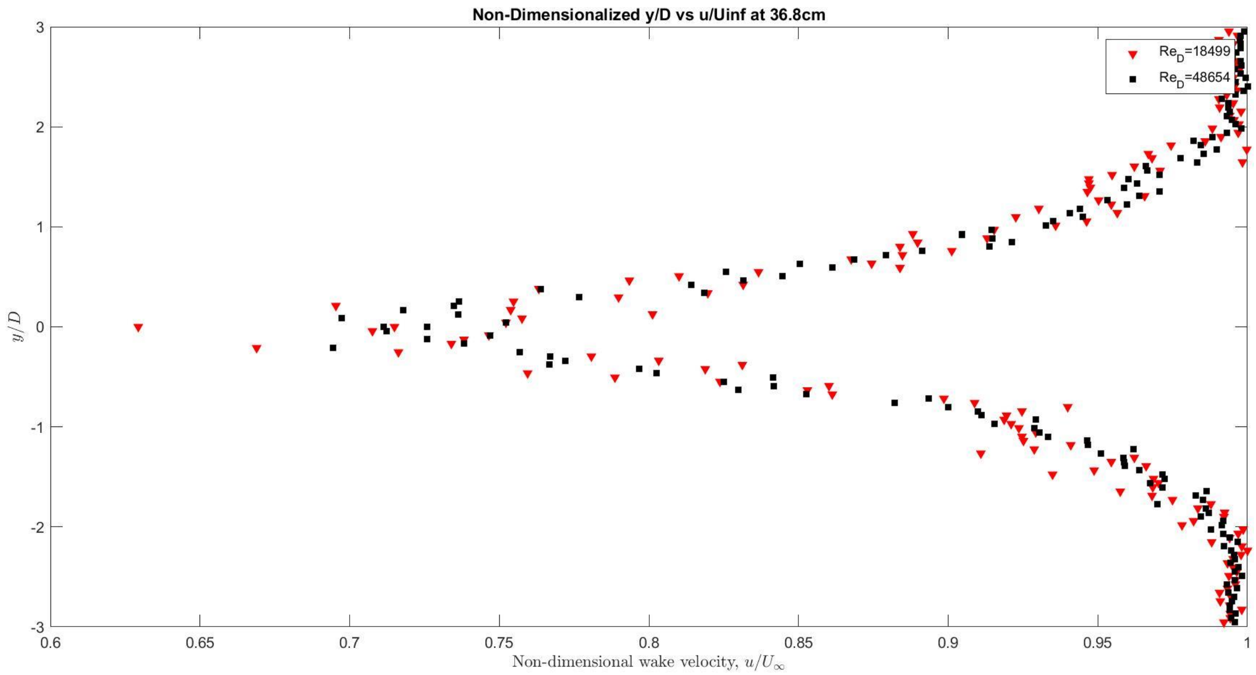

Figure 17: Probe location at 36.8cm behind the cylinder of non-dimensionalized probe position and wake velocity. For the two Reynolds numbers tested, the cylinder affects both by slowing the flow down immediately behind the cylinder.

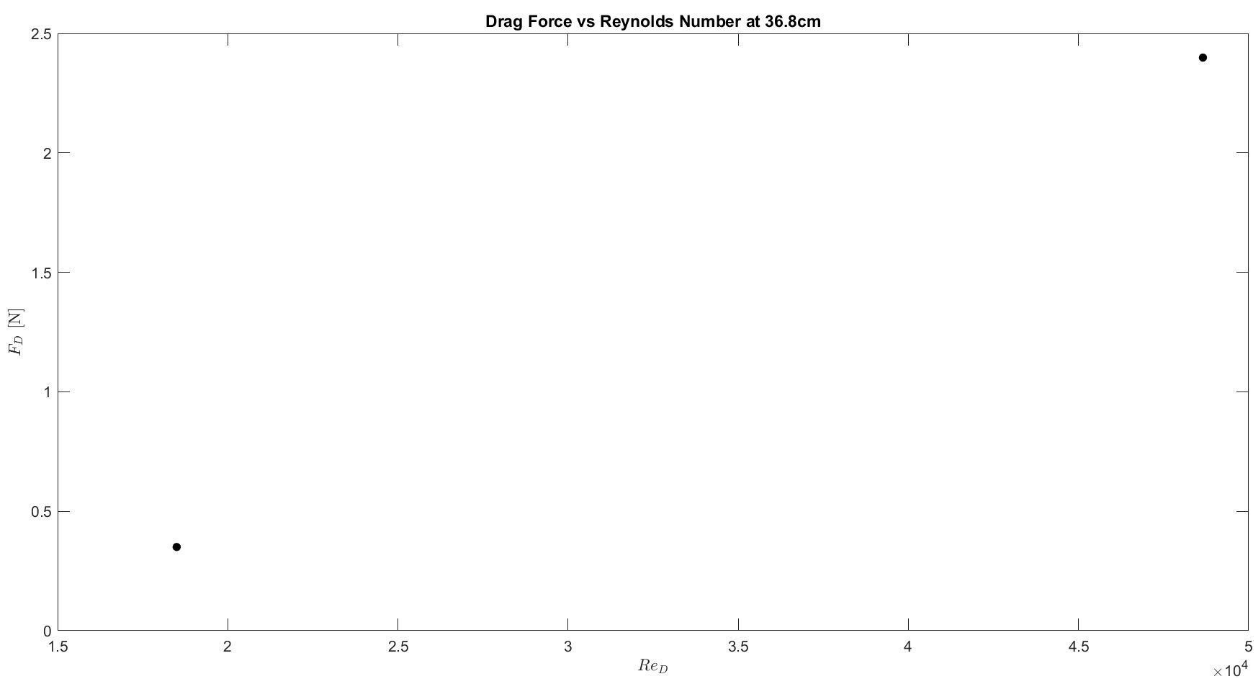

Figure 18: Probe location at 36.8cm behind the cylinder plotting drag force as a function of Reynolds number. The drag force experienced by the cylinder increases with increasing Reynolds number.

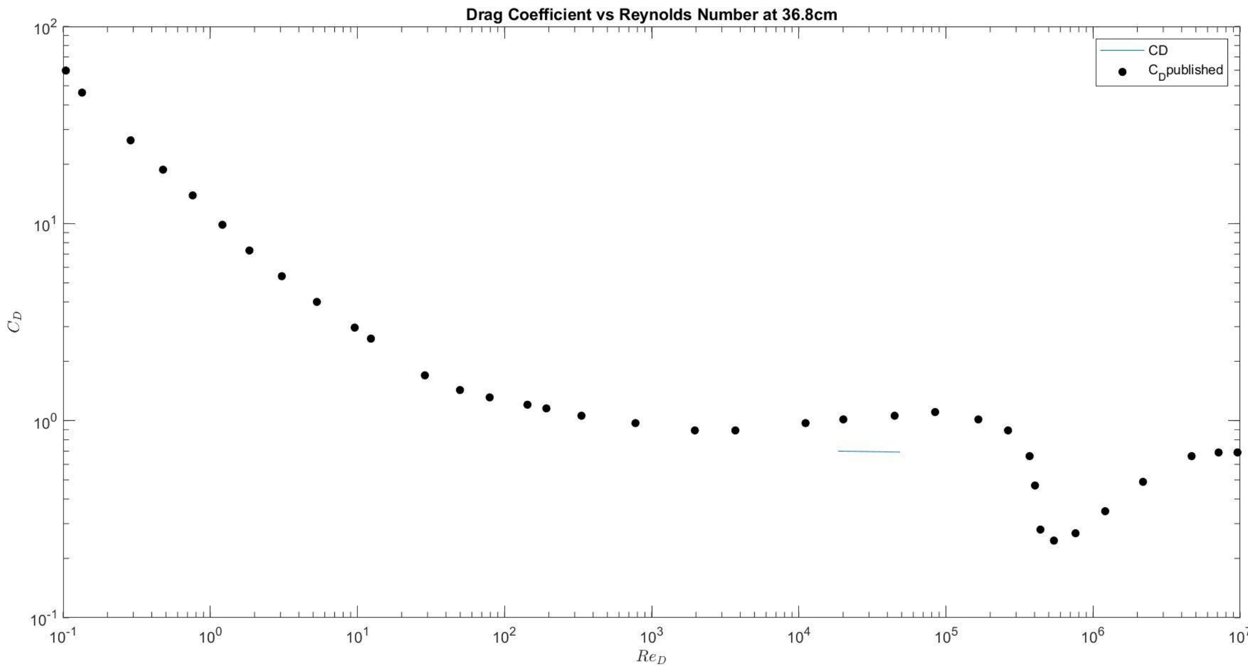

Figure 19: Probe location at 36.8cm behind the cylinder plotting drag coefficient as a function of Reynolds number. The black points are book-published values, while the blue line indicates the experimentally-obtained data from this lab. These experimental points are farther from the published values than the data for the probe location closer to the cylinder wake.

APPENDIX

Plots at Probe Location 22.9cm.

```
%% MAE 4273 Fall 2019 Lab 2
% Aerolab wind tunnel wake survey CSV file import and drag calculation
% Dr. Arvind Santhanakrishnan, Oct. 6, 2019

% READ BEFORE USING: constants, calibration equations are *roughly-guessed*
% User-inputs will need to be changed for your specific test conditions

close all; clear all; clc;

%% Define constants & test conditions
Patm=14.15; % atm. pressure in psi
Tatm_F=73; % atm. temp. in F
R=287.058; % gas constant in J.kg^-1.K^-1
mu=1.831e-5; % dyn. visc. in Pa.s, lookup for correct Tatm value!
D=0.060198; % outer diameter of cylinder in meters
L=0.60325; % length of cylinder in meters
RPM=[140 340]; % # wind tunnel RPMs tested, CHANGE based on your RPM values

%% Define folder path where CSV files are stored (note: MAC OS uses '/' whereas Windows OS uses '\')
path='C:\Users\lucas\OneDrive\College\MAE 4273\Lab 2\Data\Raw Data\Renamed Raw Data\7in';
cd(path)
Re_exp=[0.104315447 0.134412719 0.287551473 0.477418323 0.759860633 1.209396778
        1.845249286 3.06364565 5.306041498 9.58630795 12.35216599 28.75514728
        49.80210578 79.26520165 143.2066887 192.4880043 333.3771118 776.0831546
        1965.974958 3705.163179 11114.02987 20079.47223 44810.12411 84451.13769
        166028.8219 264252.04 370516.3179 403185.205 438734.5487 541932.1973
        759860.6328 1209396.778 2184990.441 4674388.132 7131994.657 9586307.95];
C_Dexp=[59.7582011 46.19513847 26.44601552 18.76255272 13.89495494 9.858000137
        7.300524071 5.406537936 4.003911523 2.965170628 2.607048246 1.697515172
        1.429813862 1.312237433 1.204329547 1.153750232 1.058875063 0.971801667
        0.891888489 0.891888489 0.971801667 1.01440453 1.058875063 1.105295141
        1.01440453 0.891888489 0.660504493 0.468605578 0.280030263 0.24620924
        0.26826958 0.347034515 0.489148802 0.660504493 0.689460384 0.689460384];


%% Define sampling characteristics used for data acquisition
sf=100; % #samples per sec
st=1; % #sec of data acquisition per location
ns=sf*st; % #samples per location
nloc=142; % #y-locations sampled

%% Define calibration equation terms
deltaP_corrected_slope=0.9496; % slope of calibration eq'n for delta P
deltaP_corrected_intercept=0; % intercept of calibration eq'n for delta P
Uinf_RPM_slope=0.0186; % slope of calibration eq'n for Uinf [m/s] v/s RPM
Uinf_RPM_intercept=0; % intercept of calibration eq'n for Uinf [m/s] v/s RPM
% Uinf_RPM_slope=0.0373; % slope of calibration eq'n for Uinf [m/s] v/s RPM
% Uinf_RPM_intercept=-0.6343; % intercept of calibration eq'n for Uinf [m/s] v/s RPM
```

```
%% Define unit conversion factors
inchtocmconv=2.54; % 1 in to cm conv.
psitopaconv=6894.75729; % 1 psi to Pa conv.
inh20topaconv=1/0.0040146; % 1 in H2O to Pa conv.
Tatm_K=(Tatm_F-32)*5/9 + 273.15; % F to K conv.

%% Calculate air density using ideal gas equation
rho=(Patm*psitopaconv)/(R*Tatm_K); % air density in kg.m^-3

for i=1:length(RPM)
% for i=1:4
   %% Initialize variables.
   filename = strcat(num2str(RPM(i)),'rpm.csv');
   data = csvread(filename,2,3);

   %% Assign columns to variables
   deltap=data(:,6); % model pressure
   yloc=data(:,16); % y-location of probe

   %% Reshape y-location and model pressure arrays
   yloc_cols=reshape(yloc(1:ns*nloc),[sf*st,nloc]);
   deltap_cols=reshape(deltap(1:ns*nloc),[sf*st,nloc]);

   %% Calculated calibration eq'n based delta P
   deltaP_cal=deltaP_corrected_slope*deltap_cols+deltaP_corrected_intercept;

   %% Calculate mean and standard deviations
   avg_yloc_cols(1,:)=mean(yloc_cols,1)*inchtocmconv;
   %     sd_yloc_cols(1,:)=std(yloc_cols,1)*inchtocmconv;
   %     avg_deltap_cols(1,:)=mean(deltap_cols,1)*inh20topaconv;
   %     sd_deltap_cols(1,:)=std(deltap_cols,1)*inh20topaconv;
   avg_deltaP_cal(1,:)=mean(deltaP_cal,1)*inh20topaconv;
   sd_deltaP_cal(1,:)=std(deltaP_cal,1)*inh20topaconv;
   u=sqrt(abs(2*avg_deltaP_cal/rho));
   Uinf(i)=max(u);
   %Uinf2(i)=Uinf_RPM_slope*RPM(i)+Uinf_RPM_intercept;

   %% Calculate Reynolds number
   Re(i)=rho*Uinf(i)*D/mu;

   %% Calculate drag force and drag coefficient
   drag_integrand(1,:)=rho*L*(u.*(Uinf(i)-u));
   avg_yloc_cols_mod=fliplr(avg_yloc_cols-min(avg_yloc_cols))*1e-2;
   FD(i)=abs(trapz(avg_yloc_cols_mod',drag_integrand(1,:)));
   CD(i)=FD(i)/(0.5*rho*(Uinf(i))^2*D*L);

   %% Plotting
   if i==1 str = 'rv'; end
   if i==2 str = 'ks'; end
   if i==3 str = 'bo'; end
   if i==4 str = 'md'; end
```

```
    if i==5 str = 'c^'; end
    if i==6 str = 'gp'; end
    if i==7 str = 'y>'; end
    if i==8 str = 'k<'; end
    if i==9 str = 'kh'; end
    str2=['r';'k';'b';'m';'c';'g';'y';'w';'w'];

    figure(1), hold on, box on
    errorbar(avg_deltaP_cal,avg_yloc_cols,sd_deltaP_cal,str,'markersize',5,'markerfacecolor',str2(i))
    xlabel('Wake pressure difference, $\Delta p_{\rm{wake}}$ [Pa]','interpreter','latex');
    ylabel('$y$ [cm]','interpreter','latex');
    title('Probe Position vs Wake Pressure Difference at 18.4cm');
    set(gca, 'FontSize', 10);

    figure(2), hold on, box on
    plot(u,avg_yloc_cols,str,'markersize',5,'markerfacecolor',str2(i))
    xlabel('Wake velocity, $u$ [m.s$^{-1}$]','interpreter','latex');
    ylabel('$y$ [cm]','interpreter','latex');
    title('Probe Position vs Wake Velocity at 18.4cm')
    set(gca, 'FontSize', 10);

    figure(3), hold on, box on
    plot(u/Uinf(i),avg_yloc_cols*1e-2/D,str,'markersize',5,'markerfacecolor',str2(i))
    xlabel('Non-dimensional wake velocity, $$u/U_\infty$$','interpreter','latex');
    ylabel('$y/D$','interpreter','latex');
    title('Non-Dimensionalized y/D vs u/Uinf at 18.4cm')

    set(gca, 'FontSize', 10);
end

figure(4), hold on, box on
semilogx(Re,FD,'ko','markersize',5,'markerfacecolor','k')
xlabel('$Re_D$','interpreter','latex');
ylabel('$F_D$ [N]','interpreter','latex');
title('Drag Force vs Reynolds Number at 18.4cm')
set(gca, 'FontSize', 10);

figure(5), box on
%semilogx(Re,CD,'ko','markersize',5,'markerfacecolor','k')
loglog(Re,CD, Re_exp,C_Dexp,'ko','markersize',5,'markerfacecolor','k')
xlabel('$Re_D$','interpreter','latex');
ylabel('$C_D$','interpreter','latex');
title('Drag Coefficient vs Reynolds Number at 18.4cm')
legend('CD','C_Dpublished')
set(gca, 'FontSize', 10);

%% Insert legends
figure(1)
legend(strcat('U_\infty=',num2str(round(Uinf(1))),' m/s'),strcat('U_\infty=',num2str(round(Uinf(2))),'
m/s'));
```

```
figure(2)
legend(strcat('U_\infty=',num2str(round(Uinf(1))),' m/s'),strcat('U_\infty=',num2str(round(Uinf(2))),'
m/s'));

figure(3)
legend(strcat('Re_D=',num2str(round(Re(1)))),strcat('Re_D=',num2str(round(Re(2)))));
```

Plots at Probe Location 18.4cm.

```
%% MAE 4273 Fall 2019 Lab 2
% Aerolab wind tunnel wake survey CSV file import and drag calculation
% Dr. Arvind Santhanakrishnan, Oct. 6, 2019

% READ BEFORE USING: constants, calibration equations are *roughly-guessed*
% User-inputs will need to be changed for your specific test conditions

close all; clear all; clc;

%% Define constants & test conditions
Patm=14.15; % atm. pressure in psi
Tatm_F=73; % atm. temp. in F
R=287.058; % gas constant in J.kg^-1.K^-1
mu=1.831e-5; % dyn. visc. in Pa.s, lookup for correct Tatm value!
D=0.060198; % outer diameter of cylinder in meters
L=0.60325; % length of cylinder in meters
RPM=[40 140 240 340 440 540 640 740]; % # wind tunnel RPMs tested, CHANGE based on your RPM
values

%% Define folder path where CSV files are stored (note: MAC OS uses '/' whereas Windows OS uses '\')
path='C:\Users\lucas\OneDrive\College\MAE 4273\Lab 2\Data\Raw Data\Renamed Raw Data';
cd(path)
%Re_published=[1.04E-01 1.34E-01 2.88E-01 4.77E-01 7.60E-01 1.21E+00 1.85E+00 3.06E+00
5.31E+00 9.59E+00 1.24E+01 2.88E+01 4.98E+01 7.93E+01 1.43E+02 1.92E+02     3.33E+02
7.76E+02 1.97E+03 3.71E+03 1.11E+04 2.01E+04 4.48E+04 8.45E+04 1.66E+05 2.64E+05 3.71E+05
4.03E+05 4.39E+05 5.42E+05 7.60E+05 1.21E+06 2.18E+06 4.67E+06 7.13E+06 9.59E+06];
%C_Dpublished=[5.98E+01 4.62E+01 2.64E+01 1.88E+01 1.39E+01 9.86E+00 7.30E+00 5.41E+00
4.00E+00 2.97E+00 2.61E+00 1.70E+00 1.43E+00 1.31E+00 1.20E+00 1.15E+00 1.06E+00 9.72E-01
8.92E-01 8.92E-01 9.72E-01 1.01E+00 1.06E+00 1.11E+00 1.01E+00 8.92E-01 6.61E-01 4.69E-01
2.80E-01 2.46E-01 2.68E-01 3.47E-01 4.89E-01 6.61E-01 6.89E-01 6.89E-01];
Re_published=[0.104315447	0.134412719	0.287551473	0.477418323	0.759860633
	1.209396778	1.845249286	3.06364565	5.306041498	9.58630795	12.35216599
	28.75514728	49.80210578	79.26520165	143.2066887	192.4880043	333.3771118
	776.0831546	1965.974958	3705.163179	11114.02987	20079.47223	44810.12411
	84451.13769	166028.8219	264252.04	370516.3179	403185.205	438734.5487
	541932.1973	759860.6328	1209396.778	2184990.441	4674388.132	7131994.657
	9586307.95];
C_Dpublished=[59.75820111	46.19513847	26.44601552	18.76255272	13.89495494
	9.858000137	7.300524071	5.406537936	4.003911523	2.965170628	2.607048246
	1.697515172	1.429813862	1.312237433	1.204329547	1.153750232	1.058875063
	0.971801667	0.891888489	0.891888489	0.971801667	1.01440453	1.058875063
	1.105295141	1.01440453	0.891888489	0.660504493	0.468605578	0.280030263
	0.24620924	0.26826958	0.347034515	0.489148802	0.660504493	0.689460384
	0.689460384];


%% Define sampling characteristics used for data acquisition
sf=100; % #samples per sec
st=1; % #sec of data acquisition per location
ns=sf*st; % #samples per location
```

```
nloc=142; % #y-locations sampled

%% Define calibration equation terms
deltaP_corrected_slope=0.9496; % slope of calibration eq'n for delta P
deltaP_corrected_intercept=0; % intercept of calibration eq'n for delta P
Uinf_RPM_slope=0.0186; % slope of calibration eq'n for Uinf [m/s] v/s RPM
Uinf_RPM_intercept=0; % intercept of calibration eq'n for Uinf [m/s] v/s RPM
% Uinf_RPM_slope=0.0373; % slope of calibration eq'n for Uinf [m/s] v/s RPM
% Uinf_RPM_intercept=-0.6343; % intercept of calibration eq'n for Uinf [m/s] v/s RPM

%% Define unit conversion factors
inchtocmconv=2.54; % 1 in to cm conv.
psitopaconv=6894.75729; % 1 psi to Pa conv.
inh20topaconv=1/0.0040146; % 1 in H2O to Pa conv.
Tatm_K=(Tatm_F-32)*5/9 + 273.15; % F to K conv.

%% Calculate air density using ideal gas equation
rho=(Patm*psitopaconv)/(R*Tatm_K); % air density in kg.m^-3

for i=1:length(RPM)
% for i=1:4
    %% Initialize variables.
    filename = strcat(num2str(RPM(i)),'rpm.csv');
    data = csvread(filename,2,3);

    %% Assign columns to variables
    deltap=data(:,6); % model pressure
    yloc=data(:,16); % y-location of probe

    %% Reshape y-location and model pressure arrays
    yloc_cols=reshape(yloc(1:ns*nloc),[sf*st,nloc]);
    deltap_cols=reshape(deltap(1:ns*nloc),[sf*st,nloc]);

    %% Calculated calibration eq'n based delta P
    deltaP_cal=deltaP_corrected_slope*deltap_cols+deltaP_corrected_intercept;

    %% Calculate mean and standard deviations
    avg_yloc_cols(1,:)=mean(yloc_cols,1)*inchtocmconv;
    %     sd_yloc_cols(1,:)=std(yloc_cols,1)*inchtocmconv;
    %     avg_deltap_cols(1,:)=mean(deltap_cols,1)*inh20topaconv;
    %     sd_deltap_cols(1,:)=std(deltap_cols,1)*inh20topaconv;
    avg_deltaP_cal(1,:)=mean(deltaP_cal,1)*inh20topaconv;
    sd_deltaP_cal(1,:)=std(deltaP_cal,1)*inh20topaconv;
    u=sqrt(abs(2*avg_deltaP_cal/rho));
    Uinf(i)=max(u);
    %Uinf2(i)=Uinf_RPM_slope*RPM(i)+Uinf_RPM_intercept;

    %% Calculate Reynolds number
    Re(i)=rho*Uinf(i)*D/mu;

    %% Calculate drag force and drag coefficient
```

```
    drag_integrand(1,:)=rho*L*(u.*(Uinf(i)-u));
    avg_yloc_cols_mod=fliplr(avg_yloc_cols-min(avg_yloc_cols))*1e-2;
    FD(i)=abs(trapz(avg_yloc_cols_mod',drag_integrand(1,:)));
    CD(i)=FD(i)/(0.5*rho*(Uinf(i))^2*D*L);

    %% Plotting
    if i==1 str = 'rv'; end
    if i==2 str = 'ks'; end
    if i==3 str = 'bo'; end
    if i==4 str = 'md'; end
    if i==5 str = 'c^'; end
    if i==6 str = 'gp'; end
    if i==7 str = 'y>'; end
    if i==8 str = 'k<'; end
    if i==9 str = 'kh'; end
    str2=['r';'k';'b';'m';'c';'g';'y';'w';'w'];

    figure(1), hold on, box on
    errorbar(avg_deltaP_cal,avg_yloc_cols,sd_deltaP_cal,str,'markersize',5,'markerfacecolor',str2(i))
    xlabel('Wake pressure difference, $\Delta p_{\rm{wake}}$ [Pa]','interpreter','latex');
    ylabel('$y$ [cm]','interpreter','latex');
    title('Probe Position vs Wake Pressure Difference at 22.9cm');
    set(gca, 'FontSize', 10);

    figure(2), hold on, box on
    plot(u,avg_yloc_cols,str,'markersize',5,'markerfacecolor',str2(i))
    xlabel('Wake velocity, $u$ [m.s$^{-1}$]','interpreter','latex');
    ylabel('$y$ [cm]','interpreter','latex');
    title('Probe Position vs Wake Velocity at 22.9cm')
    set(gca, 'FontSize', 10);

    figure(3), hold on, box on
    plot(u/Uinf(i),avg_yloc_cols*1e-2/D,str,'markersize',5,'markerfacecolor',str2(i))
    xlabel('Non-dimensional wake velocity, $$u/U_\infty$$','interpreter','latex');
    ylabel('$y/D$','interpreter','latex');
    title('Non-Dimensionalized y/D vs u/Uinf at 22.9cm')
    set(gca, 'FontSize', 10);
end

figure(4), hold on, box on
semilogx(Re,FD,'ko','markersize',5,'markerfacecolor','k')
xlabel('$Re_D$','interpreter','latex');
ylabel('$F_D$ [N]','interpreter','latex');
title('Drag Force vs Reynolds Number at 22.9cm')
set(gca, 'FontSize', 10);

figure(5), box on
%semilogx(Re,CD,'ko','markersize',5,'markerfacecolor','k')
loglog(Re,CD, Re_published,C_Dpublished,'ko','markersize',5,'markerfacecolor','k')
xlabel('$Re_D$','interpreter','latex');
ylabel('$C_D$','interpreter','latex');
```

```
legend('CD','C_Dpublished')
title('Drag Coefficient vs Reynolds Number at 22.9cm')
set(gca, 'FontSize', 10);

%% Insert legends
figure(1)
legend(strcat('U_\infty=',num2str(round(Uinf(1))),' m/s'),strcat('U_\infty=',num2str(round(Uinf(2))),' m/s'),strcat('U_\infty=',num2str(round(Uinf(3))),' m/s'),strcat('U_\infty=',num2str(round(Uinf(4))),' m/s'),strcat('U_\infty=',num2str(round(Uinf(5))),' m/s'),strcat('U_\infty=',num2str(round(Uinf(6))),' m/s'),strcat('U_\infty=',num2str(round(Uinf(7))),' m/s'),strcat('U_\infty=',num2str(round(Uinf(8))),' m/s'));
legend('Location','best')

figure(2)
legend(strcat('U_\infty=',num2str(round(Uinf(1))),' m/s'),strcat('U_\infty=',num2str(round(Uinf(2))),' m/s'),strcat('U_\infty=',num2str(round(Uinf(3))),' m/s'),strcat('U_\infty=',num2str(round(Uinf(4))),' m/s'),strcat('U_\infty=',num2str(round(Uinf(5))),' m/s'),strcat('U_\infty=',num2str(round(Uinf(6))),' m/s'),strcat('U_\infty=',num2str(round(Uinf(7))),' m/s'),strcat('U_\infty=',num2str(round(Uinf(8))),' m/s'));

figure(3)
legend(strcat('Re_D=',num2str(round(Re(1)))),strcat('Re_D=',num2str(round(Re(2)))),strcat('Re_D=',num2str(round(Re(3)))),strcat('Re_D=',num2str(round(Re(4)))),strcat('Re_D=',num2str(round(Re(5)))),strcat('Re_D=',num2str(round(Re(6)))),strcat('Re_D=',num2str(round(Re(7)))),strcat('Re_D=',num2str(round(Re(8)))));
```

Plots at Probe Location 36.8cm.

```
%% MAE 4273 Fall 2019 Lab 2
% Aerolab wind tunnel wake survey CSV file import and drag calculation
% Dr. Arvind Santhanakrishnan, Oct. 6, 2019

% READ BEFORE USING: constants, calibration equations are *roughly-guessed*
% User-inputs will need to be changed for your specific test conditions

close all; clear all; clc;

%% Define constants & test conditions
Patm=14.15; % atm. pressure in psi
Tatm_F=73; % atm. temp. in F
R=287.058; % gas constant in J.kg^-1.K^-1
mu=1.831e-5; % dyn. visc. in Pa.s, lookup for correct Tatm value!
D=0.060198; % outer diameter of cylinder in meters
L=0.60325; % length of cylinder in meters
RPM=[140 340]; % # wind tunnel RPMs tested, CHANGE based on your RPM values

%% Define folder path where CSV files are stored (note: MAC OS uses '/' whereas Windows OS uses '\')
path='C:\Users\lucas\OneDrive\College\MAE 4273\Lab 2\Data\Raw Data\Renamed Raw Data\14in';
cd(path)
Re_exp=[0.104315447 0.134412719 0.287551473 0.477418323 0.759860633 1.209396778
        1.845249286 3.06364565 5.306041498 9.58630795 12.35216599 28.75514728
        49.80210578 79.26520165 143.2066887 192.4880043 333.3771118 776.0831546
        1965.974958 3705.163179 11114.02987 20079.47223 44810.12411 84451.13769
        166028.8219 264252.04 370516.3179 403185.205 438734.5487 541932.1973
        759860.6328 1209396.778 2184990.441 4674388.132 7131994.657 9586307.95];
C_Dexp=[59.7582011 46.19513847 26.44601552 18.76255272 13.89495494 9.858000137
        7.300524071 5.406537936 4.003911523 2.965170628 2.607048246 1.697515172
        1.429813862 1.312237433 1.204329547 1.153750232 1.058875063 0.971801667
        0.891888489 0.891888489 0.971801667 1.01440453 1.058875063 1.105295141
        1.01440453 0.891888489 0.660504493 0.468605578 0.280030263 0.24620924
        0.26826958 0.347034515 0.489148802 0.660504493 0.689460384 0.689460384];

%% Define sampling characteristics used for data acquisition
sf=100; % #samples per sec
st=1; % #sec of data acquisition per location
ns=sf*st; % #samples per location
nloc=142; % #y-locations sampled

%% Define calibration equation terms
deltaP_corrected_slope=0.9496; % slope of calibration eq'n for delta P
deltaP_corrected_intercept=0; % intercept of calibration eq'n for delta P
Uinf_RPM_slope=0.0186; % slope of calibration eq'n for Uinf [m/s] v/s RPM
Uinf_RPM_intercept=0; % intercept of calibration eq'n for Uinf [m/s] v/s RPM
% Uinf_RPM_slope=0.0373; % slope of calibration eq'n for Uinf [m/s] v/s RPM
% Uinf_RPM_intercept=-0.6343; % intercept of calibration eq'n for Uinf [m/s] v/s RPM

%% Define unit conversion factors
```

```
inchtocmconv=2.54; % 1 in to cm conv.
psitopaconv=6894.75729; % 1 psi to Pa conv.
inh20topaconv=1/0.0040146; % 1 in H2O to Pa conv.
Tatm_K=(Tatm_F-32)*5/9 + 273.15; % F to K conv.

%% Calculate air density using ideal gas equation
rho=(Patm*psitopaconv)/(R*Tatm_K); % air density in kg.m^-3

for i=1:length(RPM)
% for i=1:4
    %% Initialize variables.
    filename = strcat(num2str(RPM(i)),'rpm.csv');
    data = csvread(filename,2,3);

    %% Assign columns to variables
    deltap=data(:,6); % model pressure
    yloc=data(:,16); % y-location of probe

    %% Reshape y-location and model pressure arrays
    yloc_cols=reshape(yloc(1:ns*nloc),[sf*st,nloc]);
    deltap_cols=reshape(deltap(1:ns*nloc),[sf*st,nloc]);

    %% Calculated calibration eq'n based delta P
    deltaP_cal=deltaP_corrected_slope*deltap_cols+deltaP_corrected_intercept;

    %% Calculate mean and standard deviations
    avg_yloc_cols(1,:)=mean(yloc_cols,1)*inchtocmconv;
%     sd_yloc_cols(1,:)=std(yloc_cols,1)*inchtocmconv;
%     avg_deltap_cols(1,:)=mean(deltap_cols,1)*inh20topaconv;
%     sd_deltap_cols(1,:)=std(deltap_cols,1)*inh20topaconv;
    avg_deltaP_cal(1,:)=mean(deltaP_cal,1)*inh20topaconv;
    sd_deltaP_cal(1,:)=std(deltaP_cal,1)*inh20topaconv;
    u=sqrt(abs(2*avg_deltaP_cal/rho));
    Uinf(i)=max(u);
    %Uinf2(i)=Uinf_RPM_slope*RPM(i)+Uinf_RPM_intercept;

    %% Calculate Reynolds number
    Re(i)=rho*Uinf(i)*D/mu;

    %% Calculate drag force and drag coefficient
    drag_integrand(1,:)=rho*L*(u.*(Uinf(i)-u));
    avg_yloc_cols_mod=fliplr(avg_yloc_cols-min(avg_yloc_cols))*1e-2;
    FD(i)=abs(trapz(avg_yloc_cols_mod',drag_integrand(1,:)));
    CD(i)=FD(i)/(0.5*rho*(Uinf(i))^2*D*L);

    %% Plotting
    if i==1 str = 'rv'; end
    if i==2 str = 'ks'; end
    if i==3 str = 'bo'; end
    if i==4 str = 'md'; end
    if i==5 str = 'c^'; end
```

```
    if i==6 str = 'gp'; end
    if i==7 str = 'y>'; end
    if i==8 str = 'k<'; end
    if i==9 str = 'kh'; end
    str2=['r';'k';'b';'m';'c';'g';'y';'w';'w'];

    figure(1), hold on, box on
    errorbar(avg_deltaP_cal,avg_yloc_cols,sd_deltaP_cal,str,'markersize',5,'markerfacecolor',str2(i))
    xlabel('Wake pressure difference, $\Delta p_{\rm{wake}}$ [Pa]','interpreter','latex');
    ylabel('$y$ [cm]','interpreter','latex');
    title('Probe Position vs Wake Pressure Difference at 36.8cm');
    set(gca, 'FontSize', 10);

    figure(2), hold on, box on
    plot(u,avg_yloc_cols,str,'markersize',5,'markerfacecolor',str2(i))
    xlabel('Wake velocity, $u$ [m.s$^{-1}$]','interpreter','latex');
    ylabel('$y$ [cm]','interpreter','latex');
    title('Probe Position vs Wake Velocity at 36.8cm')
    set(gca, 'FontSize', 10);

    figure(3), hold on, box on
    plot(u/Uinf(i),avg_yloc_cols*1e-2/D,str,'markersize',5,'markerfacecolor',str2(i))
    xlabel('Non-dimensional wake velocity, $$u/U_\infty$$','interpreter','latex');
    ylabel('$y/D$','interpreter','latex');
    set(gca, 'FontSize', 10);
    title('Non-Dimensionalized y/D vs u/Uinf at 36.8cm')
end

figure(4), hold on, box on
semilogx(Re,FD,'ko','markersize',5,'markerfacecolor','k')
xlabel('$Re_D$','interpreter','latex');
ylabel('$F_D$ [N]','interpreter','latex');
title('Drag Force vs Reynolds Number at 36.8cm')
set(gca, 'FontSize', 10);

figure(5), box on
%semilogx(Re,CD,'ko','markersize',5,'markerfacecolor','k')
loglog(Re,CD, Re_exp,C_Dexp,'ko','markersize',5,'markerfacecolor','k')
xlabel('$Re_D$','interpreter','latex');
ylabel('$C_D$','interpreter','latex');
title('Drag Coefficient vs Reynolds Number at 36.8cm')
legend('CD','C_Dpublished')
set(gca, 'FontSize', 10);

%% Insert legends
figure(1)
legend(strcat('U_\infty=',num2str(round(Uinf(1))),' m/s'),strcat('U_\infty=',num2str(round(Uinf(2))),'
m/s'));

figure(2)
```

```
legend(strcat('U_\infty=',num2str(round(Uinf(1))),' m/s'),strcat('U_\infty=',num2str(round(Uinf(2))),' m/s'));

figure(3)
legend(strcat('Re_D=',num2str(round(Re(1)))),strcat('Re_D=',num2str(round(Re(2)))));
```

Raw Data

40 RPM						
Avg y position	Avg model pressure	STD Pressure	Avg U∞	STD U∞	Avg U∞(U∞max-U∞)	STD U∞(U∞max-U∞)
-7	0.483398	1.12E-16	0.917507	5.58E-16	0.011619	1.74E-17
-6.9	0.483398	1.12E-16	0.917507	5.58E-16	0.011619	1.74E-17
-6.8	0.476446	0.03744	0.910182	0.035953	0.016913	0.031787
-6.7	0.421079	0.03744	0.855484	0.038149	0.062452	0.029762
-6.6	0.421054	0.020886	0.856055	0.020587	0.063027	0.017222
-6.5	0.427981	0.027848	0.862883	0.027449	0.057315	0.022963
-6.4	0.441835	0.034106	0.876539	0.033619	0.045891	0.028124
-6.3	0.448762	0.03481	0.883367	0.034312	0.040179	0.028704
-6.2	0.497202	0.027748	0.93017	0.025455	-0.00064	0.024644
-6.1	0.421054	0.020886	0.856055	0.020587	0.063027	0.017222
-6	0.434908	0.031904	0.869711	0.031447	0.051603	0.026308
-5.9	0.462616	0.031904	0.897023	0.031447	0.028755	0.026308
-5.8	0.414152	0.031079	0.848656	0.031994	0.068164	0.024409
-5.7	0.40725	0.037407	0.841257	0.038894	0.073301	0.029012
-5.6	0.434908	0.031904	0.869711	0.031447	0.051603	0.026308
-5.5	0.407225	0.020811	0.841828	0.02231	0.073876	0.015489
-5.4	0.421054	0.020886	0.856055	0.020587	0.063027	0.017222
-5.3	0.441835	0.034106	0.876539	0.033619	0.045891	0.028124
-5.2	0.400323	0.027748	0.834429	0.029746	0.079013	0.020652
-5.1	0.427981	0.027848	0.862883	0.027449	0.057315	0.022963
-5	0.400348	0.041671	0.833857	0.04349	0.078439	0.03216
-4.9	0.434908	0.031904	0.869711	0.031447	0.051603	0.026308
-4.8	0.441835	0.034106	0.87653	0.03361	0.045891	0.028124

			9	9		
-4.7	0.407225	0.020811	0.841828	0.02231	0.073876	0.015489
-4.6	0.414177	0.043952	0.848085	0.045239	0.067589	0.03451
-4.5	0.414127	1.67E-16	0.849227	1.12E-15	0.068739	1.26E-16
-4.4	0.400323	0.027748	0.834429	0.029746	0.079013	0.020652
-4.3	0.414152	0.031079	0.848656	0.031994	0.068164	0.024409
-4.2	0.414127	1.67E-16	0.849227	1.12E-15	0.068739	1.26E-16
-4.1	0.400323	0.027748	0.834429	0.029746	0.079013	0.020652
-4	0.407225	0.020811	0.841828	0.02231	0.073876	0.015489
-3.9	0.448762	0.03481	0.883367	0.034312	0.040179	0.028704
-3.8	0.407225	0.020811	0.841828	0.02231	0.073876	0.015489
-3.7	0.400323	0.027748	0.834429	0.029746	0.079013	0.020652
-3.6	0.393421	0.031789	0.827029	0.034078	0.084151	0.02366
-3.5	0.400348	0.041671	0.833857	0.04349	0.078439	0.03216
-3.4	0.400323	0.027748	0.834429	0.029746	0.079013	0.020652
-3.3	0.421054	0.020886	0.856055	0.020587	0.063027	0.017222
-3.2	0.345106	0.043873	0.773664	0.049566	0.118651	0.030387
-3.1	0.379617	0.034684	0.812231	0.037183	0.094425	0.025816
-3	0.331302	0.041621	0.758081	0.047808	0.128195	0.028091
-2.9	0.345106	0.031023	0.77445	0.035057	0.119381	0.021499
-2.8	0.345106	0.031023	0.77445	0.035057	0.119381	0.021499
-2.7	0.372714	0.033984	0.804832	0.036431	0.099562	0.025294
-2.6	0.365812	0.044418	0.796647	0.04925	0.103969	0.031611
-2.5	0.276085	0.053733	0.690075	0.068072	0.161096	0.030411
-2.4	0.276085	0.043873	0.69118	0.055603	0.162124	0.024874

-2.3	0.255378	0.031789	0.665522	0.042785	0.174317	0.015562
-2.2	0.22777	0.031789	0.628363	0.042785	0.187832	0.015562
-2.1	0.282987	0.020811	0.701575	0.024677	0.159774	0.013287
-2	0.303693	0.033984	0.726128	0.040297	0.146553	0.021698
-1.9	0.282987	0.037356	0.70047	0.046629	0.158745	0.021859
-1.8	0.207064	0.062045	0.5942	0.087152	0.192114	0.02807
-1.7	0.186357	0.062432	0.560636	0.10161	0.196953	0.018067
-1.6	0.241574	0.055927	0.644732	0.071158	0.179018	0.03126
-1.5	0.186357	0.076306	0.557177	0.119291	0.193735	0.024562
-1.4	0.220868	0.041621	0.617344	0.059622	0.189602	0.017518
-1.3	0.138042	0.043873	0.483619	0.081081	0.209452	0.007774
-1.2	0.179455	0.033984	0.556417	0.054255	0.205048	0.008715
-1.1	0.055217	0.074713	0.26546	0.224123	0.126725	0.104108
-1	0.041413	0.033984	0.208017	0.170701	0.121373	0.0996
-0.9	-0.03451	0.034684	0.173348	0.174221	0.101144	0.101654
-0.8	0.020706	0.054179	0.242687	0.159676	0.141602	0.093167
-0.7	-0.04141	0.046014	0.277356	0.139377	0.16183	0.081323
-0.6	0.013804	0.027748	0.069339	0.139377	0.040458	0.081323
-0.5	0.075923	0.020811	0.361056	0.043299	0.203626	0.004034
-0.4	0.034511	0.034684	0.173348	0.174221	0.101144	0.101654
-0.3	0.034511	0.034684	0.173348	0.174221	0.101144	0.101654
-0.2	-0.08973	0.076306	0.322168	0.230206	0.143414	0.094546
-0.1	-0.07592	0.020811	0.361056	0.043299	0.203626	0.004034
0	-0.04141	0.033984	0.208017	0.170701	0.121373	0.0996
0.1	0.041413	0.033984	0.208017	0.170701	0.121373	0.0996

0.2	-0.05522	0.027748	0.277356	0.139377	0.16183	0.081323
0.3	-0.11734	0.069715	0.399919	0.211777	0.167657	0.084555
0.4	-0.07592	0.020811	0.361056	0.043299	0.203626	0.004034
0.5	0.013804	0.027748	0.069339	0.139377	0.040458	0.081323
0.6	-0.04141	0.033984	0.208017	0.170701	0.121373	0.0996
0.7	0.027608	0.033984	0.138678	0.170701	0.080915	0.0996
0.8	0.034511	0.034684	0.173348	0.174221	0.101144	0.101654
0.9	-0.04141	0.033984	0.208017	0.170701	0.121373	0.0996
1	0.069021	0.043873	0.306078	0.163652	0.164506	0.082832
1.1	0.075923	0.020811	0.361056	0.043299	0.203626	0.004034
1.2	0.110434	0.033984	0.432859	0.070707	0.210316	0.006588
1.3	0.158749	0.062432	0.514947	0.106763	0.202533	0.014987
1.4	0.186357	0.031789	0.567436	0.050751	0.203278	0.008152
1.5	0.144945	0.037356	0.497979	0.066907	0.21079	0.007572
1.6	0.179455	0.055495	0.552958	0.082583	0.201831	0.020135
1.7	0.200161	0.037356	0.587745	0.056219	0.19813	0.013363
1.8	0.158749	0.031789	0.523359	0.050751	0.210358	0.008152
1.9	0.200161	0.037356	0.587745	0.056219	0.19813	0.013363
2	0.317498	0.046014	0.741712	0.052924	0.137009	0.030968
2.1	0.276085	0.053733	0.689451	0.074187	0.160515	0.025427
2.2	0.248476	0.063578	0.652292	0.08544	0.174031	0.03199
2.3	0.331302	0.027748	0.758866	0.032902	0.128925	0.017716
2.4	0.303693	0.033984	0.726128	0.040297	0.146553	0.021698
2.5	0.3244	0.031789	0.750682	0.037694	0.133332	0.020297
2.6	0.338204	0.037356	0.766265	0.04272	0.123788	0.025402

2.7	0.35891	0.041621	0.789248	0.046231	0.109107	0.029556
2.8	0.345106	0.043873	0.773664	0.049566	0.118651	0.030387
2.9	0.365812	0.031789	0.797432	0.034078	0.1047	0.02366
3	0.35891	0.027748	0.790033	0.029746	0.109837	0.020652
3.1	0.352008	0.020811	0.782634	0.02231	0.114974	0.015489
3.2	0.386519	0.033984	0.81963	0.036431	0.089288	0.025294
3.3	0.3244	0.076306	0.746116	0.091238	0.129085	0.048325
3.4	0.386519	0.033984	0.81963	0.036431	0.089288	0.025294
3.5	0.414127	1.67E-16	0.849227	1.12E-15	0.068739	1.26E-16
3.6	0.407225	0.020811	0.841828	0.02231	0.073876	0.015489
3.7	0.434908	0.031904	0.869711	0.031447	0.051603	0.026308
3.8	0.427981	0.027848	0.862883	0.027449	0.057315	0.022963
3.9	0.386519	0.033984	0.81963	0.036431	0.089288	0.025294
4	0.379617	0.034684	0.812231	0.037183	0.094425	0.025816
4.1	0.386519	0.033984	0.81963	0.036431	0.089288	0.025294
4.2	0.434908	0.031904	0.869711	0.031447	0.051603	0.026308
4.3	0.372714	0.033984	0.804832	0.036431	0.099562	0.025294
4.4	0.414127	1.67E-16	0.849227	1.12E-15	0.068739	1.26E-16
4.5	0.386519	0.033984	0.81963	0.036431	0.089288	0.025294
4.6	0.407225	0.020811	0.841828	0.02231	0.073876	0.015489
4.7	0.427981	0.027848	0.862883	0.027449	0.057315	0.022963
4.8	0.414127	1.67E-16	0.849227	1.12E-15	0.068739	1.26E-16
4.9	0.386519	0.033984	0.81963	0.036431	0.089288	0.025294
5	0.421054	0.020886	0.856055	0.020587	0.063027	0.017222
5.1	0.372714	0.033984	0.804832	0.036431	0.099562	0.025294

5.2	0.407225	0.020811	0.841828	0.02231	0.073876	0.015489
5.3	0.421054	0.020886	0.856055	0.020587	0.063027	0.017222
5.4	0.414152	0.031079	0.848656	0.031994	0.068164	0.024409
5.5	0.414127	1.67E-16	0.849227	1.12E-15	0.068739	1.26E-16
5.6	0.414127	1.67E-16	0.849227	1.12E-15	0.068739	1.26E-16
5.7	0.427981	0.027848	0.862883	0.027449	0.057315	0.022963
5.8	0.414127	1.67E-16	0.849227	1.12E-15	0.068739	1.26E-16
5.9	0.421054	0.020886	0.856055	0.020587	0.063027	0.017222
6	0.400348	0.041671	0.833857	0.04349	0.078439	0.03216
6.1	0.407225	0.020811	0.841828	0.02231	0.073876	0.015489
6.2	0.407225	0.020811	0.841828	0.02231	0.073876	0.015489
6.3	0.421079	0.03744	0.855484	0.038149	0.062452	0.029762
6.4	0.379617	0.034684	0.812231	0.037183	0.094425	0.025816
6.5	0.414127	1.67E-16	0.849227	1.12E-15	0.068739	1.26E-16
6.6	0.393421	0.031789	0.827029	0.034078	0.084151	0.02366
6.7	0.407225	0.020811	0.841828	0.02231	0.073876	0.015489
6.8	0.407225	0.020811	0.841828	0.02231	0.073876	0.015489
6.9	0.434908	0.031904	0.869711	0.031447	0.051603	0.026308
7	0.372714	0.033984	0.804832	0.036431	0.099562	0.025294

140 RPM						
Avg y position	Avg model pressure	STD Pressure	Avg U∞	STD U∞	Avg U∞(U∞max-U∞)	STD U∞(U∞max-U∞)
-7	15.76893	0.033984	5.24032	0.005645	0.16779	0.029416
-6.9	15.81034	0.062045	5.247189	0.010296	0.13189	0.053766
-6.8	15.82414	0.041621	5.249485	0.006904	0.119954	0.03608
-6.7	15.82414	0.027748	5.249487	0.004599	0.119968	0.024071
-6.6	15.85175	0.046014	5.254061	0.007633	0.096004	0.039886
-6.5	15.82414	0.060474	5.24948	0.010026	0.119928	0.052453
-6.4	15.94848	0.09318	5.270051	0.01539	0.011855	0.081129
-6.3	15.88626	0.065443	5.259772	0.010844	0.066013	0.056793
-6.2	15.96226	0.041722	5.272345	0.006891	-4.7E-05	0.036326
-6.1	15.74822	0.057622	5.236872	0.009582	0.185674	0.049825
-6	15.80344	0.065443	5.246043	0.010852	0.137865	0.056751
-5.9	15.85865	0.031789	5.255208	0.005269	0.090029	0.027577
-5.8	15.88631	0.095436	5.259768	0.015803	0.065904	0.082878
-5.7	15.6792	0.084676	5.225373	0.014126	0.245245	0.072982
-5.6	15.82414	0.060474	5.24948	0.010035	0.119928	0.052408
-5.5	15.78963	0.062432	5.243752	0.010369	0.149827	0.054054
-5.4	15.80344	0.057622	5.246045	0.009572	0.137878	0.049882
-5.3	15.70681	0.063955	5.22998	0.010644	0.221454	0.055258
-5.2	15.80344	0.057622	5.246045	0.009562	0.137878	0.04993
-5.1	15.78273	0.070743	5.242603	0.011753	0.155788	0.06123
-5	15.87939	0.098138	5.25862	0.016271	0.071913	0.085116
-4.9	15.77583	0.046534	5.241464	0.007736	0.161802	0.04025
-4.8	15.74822	0.037356	5.236877	0.006211	0.1857	0.032308

-4.7	15.66539	0.057622	5.223083	0.009604	0.257208	0.049709
-4.6	15.76202	0.069715	5.239163	0.011587	0.173711	0.060316
-4.5	15.66539	0.150228	5.223032	0.025069	0.25694	0.129445
-4.4	15.54806	0.134511	5.203446	0.022475	0.358011	0.115751
-4.3	15.93468	0.115347	5.267758	0.019073	0.023804	0.100311
-4.2	15.65159	0.076306	5.220774	0.012731	0.269077	0.065762
-4.1	15.46523	0.098102	5.18959	0.016477	0.429195	0.083971
-4	15.0303	0.440035	5.115571	0.075378	0.796362	0.36889
-3.9	15.75512	0.067967	5.238016	0.011296	0.179686	0.058808
-3.8	15.33409	0.156503	5.167499	0.026352	0.541101	0.13361
-3.7	15.32712	0.322495	5.166106	0.054416	0.545907	0.274721
-3.6	15.03715	0.523725	5.116514	0.089403	0.789399	0.440797
-3.5	14.84382	0.507077	5.083541	0.087348	0.952239	0.422568
-3.4	15.62408	0.426653	5.215718	0.071227	0.290325	0.36747
-3.3	14.13963	1.081156	4.95843	0.194861	1.518933	0.856013
-3.2	14.16724	0.953896	4.964229	0.168559	1.501428	0.772643
-3.1	13.82896	0.778971	4.905476	0.138204	1.780758	0.628108
-3	13.90488	0.849361	4.918536	0.15184	1.717398	0.679022
-2.9	14.1396	0.920402	4.959474	0.165727	1.524482	0.729445
-2.8	13.33183	0.517824	4.817499	0.093063	2.182644	0.411145
-2.7	13.92556	0.53752	4.923604	0.095096	1.708106	0.434743
-2.6	13.26286	0.627163	4.804551	0.114817	2.234488	0.487052
-2.5	13.40783	0.613427	4.830861	0.110105	2.120745	0.487825
-2.4	13.31112	0.995323	4.811318	0.17988	2.186113	0.785208
-2.3	12.39977	0.379018	4.646373	0.070687	2.903553	0.287406

-2.2	13.23518	0.995441	4.797433	0.183088	2.24517	0.768744
-2.1	12.69664	0.767969	4.700083	0.141852	2.669755	0.589731
-2	12.3308	0.482915	4.63309	0.090392	2.953635	0.364438
-1.9	12.19951	0.550809	4.608064	0.104093	3.050322	0.410479
-1.8	11.35032	0.84315	4.442816	0.166787	3.657903	0.589369
-1.7	12.04769	0.569816	4.579181	0.10866	3.162434	0.419676
-1.6	11.28823	0.469846	4.432793	0.091948	3.71319	0.333564
-1.5	11.75087	1.036609	4.519275	0.200617	3.363484	0.748797
-1.4	11.62653	0.469771	4.498771	0.091116	3.47191	0.337735
-1.3	10.99131	1.050426	4.369868	0.21369	3.898497	0.703532
-1.2	10.84637	0.577613	4.344553	0.116323	4.017444	0.392771
-1.1	10.04545	0.799799	4.17936	0.16428	4.541259	0.527226
-1	9.555325	1.544204	4.065238	0.339445	4.793105	0.902304
-0.9	8.623239	0.746367	3.871446	0.171001	5.394555	0.398825
-0.8	10.16971	1.55033	4.196296	0.319825	4.414154	1.01555
-0.7	8.03636	1.900329	3.712844	0.460347	5.580382	0.894766
-0.6	6.821238	0.71019	3.442059	0.177391	6.268798	0.302476
-0.5	8.098504	1.371732	3.742108	0.317595	5.626452	0.719768
-0.4	6.634831	0.623282	3.395192	0.165069	6.346319	0.21638
-0.3	7.753273	1.431805	3.659324	0.335414	5.791188	0.733202
-0.2	6.42084	1.264694	3.328408	0.323092	6.366869	0.506197
-0.1	6.048001	1.457902	3.221859	0.391818	6.454389	0.493249
0	6.282748	1.384286	3.28604	0.380201	6.38397	0.433736
0.1	5.792548	0.546788	3.172444	0.152754	6.638717	0.14889
0.2	8.284936	0.933539	3.792064	0.22054	5.565168	0.465975

0.3	7.649816	0.785507	3.645054	0.189217	5.896118	0.370888
0.4	6.793629	0.713189	3.434685	0.184728	6.277999	0.271641
0.5	8.209062	1.364484	3.76736	0.322189	5.567052	0.681675
0.6	7.525553	0.641245	3.616884	0.154429	5.963999	0.303009
0.7	9.134146	0.858904	3.98391	0.188629	5.097782	0.501815
0.8	7.684252	1.24282	3.646646	0.29095	5.844543	0.632253
0.9	9.679588	0.638838	4.103476	0.135278	4.778308	0.399769
1	9.009833	0.877888	3.956256	0.196734	5.168467	0.492535
1.1	9.845263	1.107281	4.133887	0.238101	4.65013	0.674393
1.2	10.37688	0.710399	4.24842	0.148593	4.328203	0.454177
1.3	11.17775	0.598903	4.410379	0.119656	3.787421	0.412374
1.4	11.33654	0.853669	4.440017	0.169403	3.66714	0.593949
1.5	11.14324	0.914389	4.401529	0.179946	3.800862	0.644154
1.6	12.35838	0.527581	4.638095	0.099091	2.931988	0.396463
1.7	11.8544	0.629931	4.541976	0.120797	3.302872	0.460204
1.8	12.19271	0.633048	4.6064	0.119818	3.053396	0.470839
1.9	12.17203	1.295953	4.597326	0.249665	3.041572	0.941433
2	12.70359	1.067753	4.699282	0.1999	2.653423	0.805868
2.1	12.31002	0.871119	4.627166	0.164406	2.95859	0.650406
2.2	13.14542	0.441229	4.783931	0.079503	2.330281	0.34923
2.3	12.95214	1.097245	4.744925	0.204355	2.461224	0.833996
2.4	13.26278	0.842697	4.803422	0.15493	2.228668	0.650828
2.5	13.49751	1.046933	4.844635	0.18775	2.037198	0.833535
2.6	13.51134	0.646505	4.849342	0.116166	2.037927	0.513485
2.7	12.80024	1.259782	4.715813	0.229709	2.57226	0.983522

2.8	14.38818	0.523175	5.004808	0.091878	1.330612	0.426779
2.9	14.80933	0.704373	5.076932	0.121617	0.977452	0.585511
3	13.42849	0.788221	4.833732	0.142931	2.09991	0.619208
3.1	14.7679	0.506555	5.070533	0.086578	1.015873	0.42569
3.2	15.03025	0.10779	5.11608	0.018355	0.799131	0.090938
3.3	14.20867	0.526452	4.973461	0.09291	1.47794	0.426999
3.4	14.88528	0.35548	5.091017	0.061051	0.919451	0.297181
3.5	14.77485	0.669932	5.071139	0.116238	1.006964	0.553888
3.6	15.30636	0.427783	5.162394	0.071973	0.562481	0.365503
3.7	15.52735	0.100285	5.200001	0.016788	0.375908	0.086131
3.8	14.58151	0.549739	5.038264	0.095566	1.170319	0.453609
3.9	15.54116	0.057622	5.20233	0.009637	0.364148	0.049538
4	15.61708	0.060474	5.215021	0.010101	0.298843	0.052058
4.1	15.21666	0.343032	5.147418	0.057842	0.639737	0.292431
4.2	15.63088	0.088836	5.217314	0.014836	0.286893	0.076481
4.3	15.59637	0.037356	5.211569	0.006242	0.3167	0.032146
4.4	15.57567	0.186653	5.208019	0.031288	0.334042	0.160089
4.5	15.6723	0.062045	5.224232	0.01035	0.251246	0.053482
4.6	15.51352	0.275897	5.197504	0.046738	0.386824	0.234047
4.7	15.6861	0.041621	5.226538	0.006935	0.239364	0.035921
4.8	15.63779	0.077557	5.218471	0.012958	0.280972	0.066743
4.9	15.61708	0.027748	5.215029	0.00463	0.298883	0.023911
5	15.78273	0.033984	5.242613	0.005645	0.155841	0.029416
5.1	15.61708	0.060474	5.215021	0.010101	0.298843	0.052058
5.2	15.80344	0.095366	5.24603	0.015841	0.137799	0.082558

5.3	15.81034	0.031023	5.247197	0.005148	0.13193	0.026883
5.4	15.78963	0.062432	5.243752	0.010369	0.149827	0.054054
5.5	15.83105	0.076306	5.250619	0.012663	0.113914	0.066118
5.6	15.76893	0.033984	5.24032	0.005645	0.16779	0.029416
5.7	15.6723	0.043873	5.224237	0.007312	0.251273	0.03785
5.8	15.65159	0.044418	5.220785	0.007406	0.26913	0.038304
5.9	15.76893	0.033984	5.24032	0.005645	0.16779	0.029416
6	15.77583	0.063955	5.241459	0.01062	0.161776	0.055381
6.1	15.77583	0.034684	5.241466	0.005762	0.161815	0.030023
6.2	15.76202	0.054179	5.239168	0.009009	0.173738	0.046853
6.3	15.81724	0.037356	5.248341	0.006197	0.125942	0.03238
6.4	15.74132	0.053733	5.235726	0.008936	0.191648	0.04646
6.5	15.74822	0.065443	5.23687	0.010883	0.18566	0.056585
6.6	15.76202	0.076306	5.23916	0.012677	0.173698	0.066044
6.7	15.71371	0.033984	5.231137	0.005658	0.215533	0.029351
6.8	15.78273	0.033984	5.242613	0.005645	0.155841	0.029416
6.9	15.62398	0.044418	5.216178	0.007405	0.292922	0.038312
7	15.6861	0.027748	5.22654	0.00462	0.239378	0.023965

240 RPM						
Avg y position	Avg model pressure	STD Pressure	Avg U∞	STD U∞	Avg U∞(U∞max-U∞)	STD U∞(U∞max-U∞)
-7	53.27911	0.069715	9.632418	0.006301	0.234016	0.060562
-6.9	53.45856	0.088019	9.648626	0.00794	0.07801	0.076605
-6.8	53.54829	0.116903	9.656717	0.010537	-0.00011	0.101826
-6.7	53.23769	0.078788	9.628674	0.007125	0.269972	0.068398
-6.6	53.38264	0.060474	9.641773	0.005461	0.144056	0.052583
-6.5	53.08575	0.065538	9.614924	0.005933	0.401804	0.056834
-6.4	53.2515	0.082371	9.629922	0.00745	0.257984	0.071507
-6.3	53.25835	0.213213	9.630525	0.019287	0.251877	0.185056
-6.2	52.98907	0.178993	9.606153	0.016224	0.485468	0.155034
-6.1	52.79571	0.397485	9.588556	0.036187	0.652269	0.342762
-6	53.09955	0.467984	9.616083	0.042389	0.38896	0.405638
-5.9	53.24447	0.379787	9.629229	0.034295	0.263529	0.330212
-5.8	52.80951	0.129592	9.58987	0.011766	0.640917	0.112063
-5.7	53.04424	0.30571	9.611126	0.027656	0.437423	0.265313
-5.6	52.68528	0.072423	9.578588	0.006583	0.748325	0.062554
-5.5	52.98217	0.302802	9.605502	0.027435	0.491202	0.26239
-5.4	52.69908	0.069715	9.579843	0.006335	0.736404	0.060227
-5.3	52.65077	0.103822	9.575448	0.009438	0.778101	0.089657
-5.2	52.19515	0.376228	9.53387	0.034441	1.170032	0.322602
-5.1	52.56794	0.103822	9.567913	0.009452	0.849579	0.089522
-5	52.3539	0.205965	9.548401	0.018754	1.033898	0.177574
-4.9	52.4368	0.121148	9.55597	0.011035	0.962619	0.104416
-4.8	52.79573	0.440009	9.588543	0.039981	0.652103	0.380181

-4.7	52.34012	0.664451	9.546972	0.060695	1.04409	0.571005
-4.6	52.48509	0.537283	9.560251	0.048939	0.919868	0.463076
-4.5	52.16754	0.381574	9.531347	0.034915	1.193742	0.32733
-4.4	52.347	0.670503	9.547595	0.061279	1.038135	0.575903
-4.3	52.96146	0.381884	9.603602	0.034647	0.508911	0.330462
-4.2	52.05698	0.955414	9.520906	0.087531	1.285457	0.818559
-4.1	51.93967	0.689096	9.510362	0.063278	1.387926	0.588977
-4	51.74631	0.862333	9.492523	0.079279	1.552391	0.736165
-3.9	50.73143	0.874282	9.398954	0.080972	2.416208	0.740618
-3.8	50.77974	0.973056	9.403345	0.090277	2.374472	0.822773
-3.7	51.3873	1.06873	9.459354	0.098713	1.857283	0.907921
-3.6	49.92363	2.031932	9.322253	0.189844	3.082275	1.705411
-3.5	49.91673	1.090083	9.322967	0.102269	3.101186	0.910784
-3.4	51.29062	1.601527	9.449826	0.147186	1.933639	1.367733
-3.3	49.30914	2.201015	9.264275	0.208856	3.592504	1.816562
-3.2	48.77065	1.936529	9.214083	0.18229	4.04557	1.612238
-3.1	49.19871	1.288536	9.25543	0.121793	3.699401	1.067855
-3	48.99162	1.927553	9.234951	0.181789	3.862276	1.601435
-2.9	49.40582	2.189705	9.273436	0.205303	3.512604	1.830813
-2.8	48.03883	1.719309	9.144992	0.16482	4.652825	1.402619
-2.7	44.66272	1.165434	8.818447	0.116412	7.378828	0.905474
-2.6	44.80076	2.313205	8.829878	0.229316	7.248826	1.814527
-2.5	45.40835	2.479825	8.889183	0.244794	6.763426	1.954927
-2.4	44.5039	2.212258	8.800805	0.219432	7.48505	1.733861
-2.3	43.54425	1.457529	8.706883	0.145094	8.249255	1.137244

-2.2	42.69504	1.802031	8.620857	0.181458	8.8974	1.386063
-2.1	43.88941	1.524654	8.741213	0.152163	7.979696	1.18585
-2	42.24628	1.206413	8.576449	0.122263	9.250064	0.920311
-1.9	41.44539	1.892944	8.493422	0.194194	9.843022	1.421354
-1.8	42.13577	1.971652	8.5638	0.198878	9.320364	1.513282
-1.7	40.3614	1.411269	8.382516	0.146559	10.65975	1.04258
-1.6	38.92541	1.560164	8.231658	0.164905	11.70368	1.124666
-1.5	40.45116	2.688191	8.3885	0.279249	10.56124	1.985088
-1.4	36.30876	1.696972	7.949563	0.187382	13.53637	1.145859
-1.3	36.92315	1.866484	8.016183	0.203654	13.10976	1.284431
-1.2	36.20513	1.738642	7.938119	0.190982	13.60632	1.183764
-1.1	33.40212	2.211287	7.622784	0.249603	15.44255	1.441258
-1	32.26983	2.479856	7.491031	0.286255	16.1421	1.55555
-0.9	31.66917	1.752938	7.423482	0.20734	16.53582	1.051046
-0.8	30.13645	3.615289	7.231779	0.429756	17.35377	2.150909
-0.7	24.96527	4.880475	6.561875	0.649672	19.89011	2.259883
-0.6	26.58081	3.548367	6.787897	0.464836	19.25934	1.707363
-0.5	25.66946	3.540575	6.670163	0.461997	19.7095	1.71958
-0.4	25.9802	3.409516	6.711941	0.441954	19.57179	1.673542
-0.3	23.77085	6.146164	6.380331	0.833277	20.21702	2.722525
-0.2	23.76397	3.281684	6.418244	0.438312	20.59512	1.499487
-0.1	25.4969	5.637207	6.620512	0.759252	19.53053	2.507674
0	25.35879	3.228926	6.632079	0.422697	19.88275	1.546253
0.1	22.45907	3.064399	6.239522	0.426373	21.14169	1.240803
0.2	25.80067	3.79842	6.684691	0.498267	19.62129	1.818452

0.3	22.59024	3.463721	6.253839	0.481512	21.05152	1.390218
0.4	24.8272	3.114653	6.562564	0.412401	20.1372	1.458139
0.5	32.71169	2.333981	7.542714	0.272692	15.8717	1.432997
0.6	29.08013	2.238771	7.111111	0.273441	18.02806	1.259663
0.7	28.75563	3.025234	7.066494	0.378044	18.16231	1.625473
0.8	32.32504	2.069584	7.499016	0.241186	16.12305	1.276133
0.9	32.64957	2.150277	7.536389	0.247851	15.9188	1.352251
1	34.69314	1.807131	7.770167	0.20421	14.61752	1.175417
1.1	33.12594	4.19051	7.580345	0.477713	15.51369	2.690775
1.2	35.44572	2.114267	7.853256	0.232984	14.1093	1.432758
1.3	34.67939	1.519952	7.769431	0.17045	14.63437	1.00107
1.4	36.9163	1.618442	8.016113	0.174797	13.12102	1.130802
1.5	38.29022	2.762734	8.160585	0.294396	12.12351	1.968981
1.6	38.60784	1.96158	8.19707	0.206258	11.92271	1.424697
1.7	41.21757	1.966523	8.469861	0.201657	10.01224	1.477415
1.8	42.15655	2.027608	8.565732	0.206588	9.302832	1.536191
1.9	42.21175	0.904306	8.573315	0.092116	9.279944	0.685326
2	42.85382	1.25899	8.637837	0.127307	8.784872	0.963157
2.1	44.93888	1.91502	8.84444	0.188604	7.148919	1.513805
2.2	44.08277	1.978115	8.75961	0.195081	7.820629	1.561199
2.3	45.51188	1.893392	8.900687	0.187957	6.694216	1.482535
2.4	43.5235	1.555967	8.704618	0.156135	8.263528	1.202143
2.5	45.52576	1.265519	8.903159	0.12361	6.693922	1.010222
2.6	45.93308	1.577466	8.942427	0.154737	6.363782	1.252977
2.7	44.98722	1.732287	8.849514	0.17297	7.113735	1.346618

2.8	45.38762	2.381811	8.887509	0.231347	6.783361	1.913989
2.9	47.81098	1.766968	9.123175	0.170158	4.838929	1.434081
3	47.67289	1.108622	9.110943	0.106477	4.961289	0.902461
3.1	48.31499	1.896217	9.170973	0.17964	4.422795	1.567588
3.2	48.47379	1.630093	9.1865	0.153956	4.296187	1.352215
3.3	49.47489	1.264355	9.281414	0.118868	3.469357	1.054002
3.4	51.02829	1.655911	9.42553	0.153101	2.155857	1.405367
3.5	50.38622	1.260057	9.36653	0.11806	2.704251	1.054346
3.6	51.63588	0.68374	9.48251	0.062888	1.648008	0.583426
3.7	51.02142	1.154858	9.425525	0.106934	2.167787	0.978549
3.8	50.52431	0.919404	9.379711	0.085163	2.591058	0.778738
3.9	52.17439	0.632902	9.531862	0.057817	1.186789	0.543848
4	52.36773	0.582421	9.549533	0.053255	1.020748	0.499999
4.1	52.25032	0.645572	9.538789	0.058799	1.121465	0.556438
4.2	52.74744	0.387604	9.584176	0.035208	0.694021	0.335001
4.3	52.47819	0.428247	9.559667	0.039092	0.926251	0.368276
4.4	52.02938	0.398874	9.51871	0.036544	1.312327	0.34173
4.5	52.49202	0.294484	9.560969	0.026749	0.914737	0.254528
4.6	52.69908	0.054179	9.579844	0.004925	0.736412	0.04679
4.7	52.70598	0.219802	9.580452	0.019979	0.730263	0.189844
4.8	52.89924	0.060474	9.598019	0.005488	0.563354	0.052315
4.9	52.54033	0.087746	9.565402	0.007983	0.873405	0.075711
5	52.85098	0.186856	9.593626	0.016955	0.604985	0.161678
5.1	52.74049	0.048558	9.583607	0.004412	0.700637	0.04196
5.2	52.78881	0.176039	9.587984	0.015992	0.658761	0.152133

5.3	52.9269	0.226342	9.600508	0.020528	0.53922	0.195931
5.4	52.94758	0.072474	9.602403	0.006571	0.521504	0.062752
5.5	52.80266	0.198231	9.589238	0.017994	0.64675	0.171445
5.6	53.04434	0.103229	9.61117	0.009356	0.437673	0.08942
5.7	52.89924	0.060474	9.598019	0.005487	0.563354	0.052329
5.8	52.84402	0.055495	9.593009	0.005037	0.611129	0.048005
5.9	53.11338	0.164397	9.617416	0.014888	0.377751	0.142526
6	53.09268	0.069469	9.615551	0.006292	0.395796	0.060218
6.1	53.19628	0.083531	9.624927	0.007557	0.305916	0.072493
6.2	53.08575	0.057731	9.614924	0.005228	0.401808	0.050052
6.3	53.36193	0.176721	9.639891	0.015968	0.161944	0.153552
6.4	53.34123	0.178751	9.638021	0.016145	0.179938	0.155382
6.5	52.92687	0.27444	9.600495	0.02497	0.539141	0.236797
6.6	53.14106	0.054179	9.619933	0.004903	0.35384	0.047002
6.7	53.17558	0.041621	9.623056	0.003766	0.323905	0.036113
6.8	53.28601	0.097116	9.63304	0.00878	0.228002	0.084335
6.9	53.23769	0.078788	9.628674	0.007125	0.269972	0.068398
7	53.12721	0.064036	9.618678	0.005798	0.365852	0.055532

340 RPM						
Avg y position	Avg model pressure	STD Pressure	Avg U∞	STD U∞	Avg U∞(U∞max-U∞)	STD U∞(U∞max-U∞)
-7	112.7096	0.291527	14.00997	0.018128	-0.00033	0.253711
-6.9	112.2885	0.503427	13.98375	0.031341	0.365697	0.437615
-6.8	111.6603	0.328482	13.94459	0.020533	0.91119	0.284375
-6.7	112.1919	0.30559	13.97775	0.01903	0.449989	0.265563
-6.6	112.4542	0.320686	13.99408	0.019957	0.221945	0.278871
-6.5	111.8121	0.667198	13.95402	0.041651	0.778938	0.578365
-6.4	112.2125	0.495631	13.97902	0.03093	0.431727	0.429795
-6.3	111.9986	0.374653	13.9657	0.023382	0.617757	0.324865
-6.2	112.4266	0.362162	13.99236	0.02253	0.24588	0.315052
-6.1	111.9364	0.529447	13.9618	0.033032	0.67144	0.459233
-6	111.7224	0.644088	13.94843	0.040204	0.856796	0.558398
-5.9	111.6119	0.444515	13.94156	0.02774	0.952992	0.385465
-5.8	111.4463	0.368232	13.93122	0.023007	1.096545	0.318932
-5.7	111.2529	0.833917	13.91905	0.052167	1.262812	0.721386
-5.6	110.8731	0.519678	13.89533	0.032584	1.591849	0.4485
-5.5	110.9007	0.907923	13.89698	0.056957	1.566917	0.783148
-5.4	110.597	0.900668	13.87794	0.056596	1.829104	0.775571
-5.3	111.1907	0.36619	13.91524	0.022914	1.3177	0.316687
-5.2	111.4669	0.82349	13.93244	0.051478	1.077582	0.712873
-5.1	110.3899	0.606851	13.86501	0.038079	2.008477	0.523328
-5	111.1562	0.479755	13.91306	0.030003	1.347334	0.415132
-4.9	111.0871	0.57888	13.90873	0.036268	1.406841	0.499991
-4.8	111.0389	0.364643	13.90573	0.022818	1.448952	0.315336

-4.7	109.4026	1.152435	13.80272	0.072781	2.855301	0.987263
-4.6	109.948	1.321391	13.83703	0.083327	2.386075	1.133755
-4.5	110.7696	0.798509	13.88879	0.050138	1.680529	0.688143
-4.4	109.8376	1.089844	13.83016	0.06866	2.482146	0.935998
-4.3	110.5693	0.631594	13.87626	0.039644	1.853751	0.544482
-4.2	110.2932	0.756498	13.8589	0.047552	2.091397	0.651208
-4.1	108.3532	2.227247	13.73582	0.142216	3.745573	1.886288
-4	110.0791	1.63205	13.84515	0.102673	2.271498	1.403767
-3.9	108.0218	3.045723	13.71418	0.193567	4.019409	2.592234
-3.8	108.291	2.150717	13.73194	0.136766	3.799363	1.829324
-3.7	107.7111	1.695047	13.69537	0.107613	4.297037	1.444232
-3.6	107.7594	1.829522	13.69838	0.115927	4.254968	1.56195
-3.5	105.702	1.716296	13.56702	0.110285	5.997507	1.443814
-3.4	106.6064	2.484568	13.62446	0.158808	5.227307	2.101961
-3.3	103.6445	1.206551	13.43454	0.078021	7.72455	1.008114
-3.2	104.1831	1.141902	13.46943	0.073823	7.275407	0.954325
-3.1	103.9345	2.674309	13.45245	0.172788	7.470427	2.236567
-3	101.0831	2.811287	13.26644	0.184823	9.830096	2.306484
-2.9	99.9647	1.665193	13.19366	0.110101	10.75808	1.357384
-2.8	96.85087	5.072991	12.98247	0.34448	13.22195	4.009311
-2.7	97.96248	2.020286	13.06063	0.134255	12.3811	1.637419
-2.6	97.8451	3.508438	13.0514	0.234245	12.45628	2.828364
-2.5	96.46423	1.945068	12.96039	0.131434	13.58587	1.545945
-2.4	96.6369	5.10414	12.96809	0.345331	13.39309	4.051444
-2.3	94.91773	4.233049	12.85357	0.28643	14.78258	3.360137

-2.2	97.54131	3.481643	13.03113	0.233808	12.70126	2.78774
-2.1	86.68806	5.219764	12.28109	0.374313	21.09378	3.846941
-2	90.54746	4.136659	12.55407	0.284549	18.19724	3.218616
-1.9	85.21056	4.087674	12.17812	0.291984	22.2241	3.028212
-1.8	83.61569	4.414178	12.06287	0.319068	23.38684	3.21771
-1.7	83.10484	3.380467	12.02765	0.245353	23.78306	2.450188
-1.6	80.36387	2.261909	11.82891	0.166324	25.77211	1.609016
-1.5	79.16255	4.461488	11.73658	0.335234	26.57055	3.073944
-1.4	76.9463	3.520445	11.5727	0.26891	28.13416	2.364442
-1.3	76.08336	3.621422	11.50745	0.274884	28.72278	2.455963
-1.2	76.3802	5.607906	11.52541	0.424077	28.45748	3.82843
-1.1	68.06763	2.699472	10.88539	0.214032	33.96686	1.702746
-1	65.36816	3.310205	10.66601	0.270461	35.59429	1.976797
-0.9	66.57635	2.382996	10.76586	0.192055	34.88913	1.459329
-0.8	66.04471	7.737982	10.70639	0.6257	34.98182	4.717807
-0.7	56.80701	10.03078	9.904925	0.909928	39.84045	4.839386
-0.6	52.13986	4.187741	9.521588	0.374602	42.59758	2.049651
-0.5	53.94184	5.935246	9.677212	0.540494	41.63979	2.769663
-0.4	53.70709	8.374599	9.640759	0.768446	41.53789	3.850075
-0.3	51.09046	8.211457	9.402341	0.757497	42.75442	3.704603
-0.2	53.18235	10.68078	9.570462	1.015682	41.46683	4.463652
-0.1	55.77832	6.226544	9.840569	0.549582	40.73024	3.151756
0	47.83169	6.188188	9.107751	0.591114	44.30225	2.508959
0.1	44.56604	4.492026	8.798423	0.446989	45.65558	1.569255
0.2	49.56462	6.761019	9.267976	0.650962	43.52916	2.677673

0.3	54.45279	5.027985	9.727554	0.451859	41.45528	2.432384
0.4	58.36736	8.832223	10.05097	0.793021	39.1692	4.331712
0.5	56.13731	8.680484	9.858833	0.75504	40.36096	4.561011
0.6	58.94732	7.688546	10.10971	0.67282	38.98229	3.979669
0.7	60.19012	5.619704	10.22726	0.473529	38.46477	3.156304
0.8	65.49932	6.065565	10.66861	0.497789	35.40233	3.591449
0.9	63.22093	3.622192	10.48837	0.303013	36.84492	2.063377
1	69.96629	3.149528	11.03552	0.248157	32.76364	2.008812
1.1	67.52219	4.755539	10.83723	0.378421	34.24193	2.983428
1.2	75.51716	4.830947	11.46199	0.366508	29.0719	3.279618
1.3	76.13855	5.136354	11.50817	0.394832	28.63676	3.414518
1.4	78.7345	3.313044	11.70694	0.247442	26.90078	2.303268
1.5	77.3468	3.35477	11.60317	0.252012	27.86359	2.312443
1.6	85.16914	4.499003	12.17436	0.323635	22.24363	3.301791
1.7	89.07686	3.10731	12.45298	0.218215	19.34196	2.354563
1.8	87.38532	1.612763	12.33553	0.113655	20.64225	1.2163
1.9	86.86061	2.233916	12.29796	0.15737	21.02965	1.685663
2	91.56923	3.530662	12.62565	0.240489	17.42066	2.779658
2.1	90.42315	2.648425	12.54731	0.183928	18.31895	2.035428
2.2	95.22157	3.796128	12.87479	0.255143	14.55071	3.036503
2.3	96.01551	2.438526	12.92983	0.164569	13.93918	1.941126
2.4	97.43772	2.652831	13.02508	0.178214	12.79685	2.123163
2.5	97.24446	3.2597	13.01153	0.21954	12.94355	2.601099
2.6	99.30182	3.315219	13.14846	0.220871	11.2792	2.679203
2.7	103.0508	2.964149	13.39487	0.192303	8.202578	2.467874

2.8	101.5595	2.33008	13.29807	0.152896	9.443681	1.915785
2.9	101.5802	2.265327	13.29948	0.148911	9.427181	1.858765
3	100.1787	3.764806	13.20594	0.247486	10.55736	3.089294
3.1	104.1071	3.82576	13.46246	0.24792	7.310018	3.18932
3.2	103.7619	1.666346	13.44195	0.107744	7.623817	1.392396
3.3	106.7928	1.981881	13.6367	0.126891	5.074175	1.673663
3.4	104.4109	2.779581	13.48315	0.180631	7.070907	2.310007
3.5	106.7514	4.120123	13.63209	0.265469	5.081564	3.456143
3.6	108.9607	2.261842	13.77427	0.143019	3.226261	1.935264
3.7	108.1184	2.731126	13.72056	0.174905	3.940542	2.305802
3.8	108.5534	1.621715	13.74886	0.102735	3.579539	1.384851
3.9	108.291	1.360914	13.73234	0.086278	3.80505	1.161245
4	110.3968	1.156112	13.8653	0.072726	2.000653	0.994437
4.1	108.94	1.335644	13.77344	0.084705	3.250667	1.139284
4.2	110.2173	0.834488	13.85411	0.052395	2.156532	0.719178
4.3	110.5901	1.490796	13.87731	0.093801	1.832261	1.282031
4.4	110.024	2.502499	13.84115	0.159336	2.311539	2.125769
4.5	111.4669	0.438061	13.9325	0.02741	1.07857	0.378853
4.6	111.0113	0.540592	13.90398	0.033879	1.472497	0.466779
4.7	111.2598	0.729864	13.9195	0.045784	1.257153	0.629599
4.8	110.9214	0.541225	13.89835	0.033908	1.550121	0.467471
4.9	111.4116	0.526665	13.92903	0.032908	1.126276	0.456134
5	111.5635	0.569217	13.93852	0.035551	0.994605	0.493205
5.1	111.1079	0.32254	13.91006	0.020193	1.389329	0.278785
5.2	110.9215	0.733833	13.89832	0.046071	1.549593	0.632492

5.3	111.7155	0.416877	13.94803	0.026009	0.863225	0.361596
5.4	111.8673	0.428912	13.9575	0.026736	0.731596	0.37236
5.5	111.7016	0.390622	13.94717	0.02438	0.875275	0.338687
5.6	111.5981	0.139507	13.94072	0.008713	0.965298	0.120874
5.7	111.895	0.377564	13.95924	0.023556	0.707638	0.327494
5.8	111.4531	0.265206	13.93165	0.016567	1.09076	0.229736
5.9	111.7777	0.25021	13.95193	0.015628	0.809541	0.216788
6	111.6602	0.167294	13.9446	0.010442	0.911454	0.14505
6.1	111.9917	0.330501	13.96527	0.020637	0.623808	0.286438
6.2	112.1228	0.124091	13.97346	0.007733	0.510112	0.107767
6.3	112.3092	0.381438	13.98505	0.023766	0.347929	0.331304
6.4	112.2471	0.097116	13.9812	0.006049	0.402198	0.084375
6.5	112.0745	0.142333	13.97045	0.008873	0.552057	0.123556
6.6	111.7361	0.13245	13.94934	0.008266	0.845642	0.114845
6.7	112.0055	0.201233	13.96614	0.012553	0.611959	0.174576
6.8	112.6406	0.077669	14.00569	0.004829	0.059916	0.067605
6.9	112.5163	0.299347	13.99795	0.018625	0.167914	0.260364
7	112.0676	0.041621	13.97002	0.002594	0.558086	0.036137

440 RPM						
Avg y position	Avg model pressure	STD Pressure	Avg U∞	STD U∞	Avg U∞(U∞max-U∞)	STD U∞(U∞max-U∞)
-7	191.6789	0.975446	18.27018	0.046485	0.550746	0.848012
-6.9	192.2934	0.536409	18.29948	0.02552	0.016875	0.46711
-6.8	192.3141	0.83859	18.30044	0.039899	-0.00158	0.730212
-6.7	192.2727	0.867547	18.29846	0.041312	0.034403	0.754776
-6.6	191.2992	0.765047	18.25209	0.036499	0.881098	0.664359
-6.5	192.0862	0.919385	18.28958	0.043754	0.196597	0.800354
-6.4	191.8999	0.609099	18.28074	0.028997	0.359239	0.530064
-6.3	191.5062	1.369552	18.26189	0.065317	0.699753	1.189693
-6.2	192.1829	0.980423	18.29418	0.046678	0.112302	0.853136
-6.1	191.9344	0.787493	18.28237	0.037499	0.328962	0.685142
-6	192.0793	0.731348	18.28928	0.034825	0.202929	0.63631
-5.9	190.4707	0.964396	18.2125	0.046133	1.599388	0.835197
-5.8	190.5673	1.193314	18.21709	0.057044	1.515085	1.034181
-5.7	190.6364	1.272969	18.22038	0.060821	1.454992	1.103785
-5.6	190.7192	0.780241	18.2244	0.037263	1.384309	0.676837
-5.5	190.3188	1.018976	18.20523	0.048697	1.730885	0.883328
-5.4	190.3188	0.51945	18.20528	0.02484	1.731714	0.450025
-5.3	190.1738	1.74285	18.19817	0.083318	1.854155	1.510347
-5.2	190.3119	0.875093	18.20492	0.04185	1.73715	0.758072
-5.1	189.5179	0.839008	18.16691	0.040207	2.424196	0.7253
-5	190.5052	1.252108	18.21411	0.059895	1.568778	1.0844
-4.9	189.8424	1.136794	18.18242	0.054406	2.14293	0.984024
-4.8	189.7388	0.86545	18.17749	0.041442	2.233122	0.748744

-4.7	190.5259	1.447305	18.21507	0.069298	1.55023	1.252252
-4.6	189.4834	1.036291	18.16523	0.049674	2.45362	0.895615
-4.5	188.3787	1.16662	18.11218	0.056088	3.406591	1.005195
-4.4	187.7573	2.421741	18.082	0.116703	3.936289	2.081673
-4.3	189.1657	1.331981	18.14995	0.06399	2.727196	1.148554
-4.2	186.7148	2.091411	18.03182	0.101062	4.833509	1.792636
-4.1	186.5768	2.409148	18.02506	0.116275	4.950232	2.067568
-4	188.1785	2.003708	18.10239	0.096489	3.575978	1.723602
-3.9	185.403	2.172891	17.96834	0.105184	5.956248	1.8591
-3.8	184.6367	1.650489	17.9313	0.080106	6.612809	1.408293
-3.7	185.9347	4.389663	17.99313	0.213636	5.484145	3.734973
-3.6	180.2388	2.11362	17.71633	0.103717	10.33759	1.782728
-3.5	177.8569	4.213183	17.59795	0.208947	12.31918	3.513383
-3.4	179.217	3.721855	17.66539	0.183992	11.18483	3.114468
-3.3	177.2976	4.744685	17.56994	0.23441	12.78046	3.972999
-3.2	175.9582	5.6428	17.50271	0.283337	13.88284	4.641844
-3.1	175.3783	4.262498	17.4748	0.215002	14.382	3.488495
-3	176.1585	4.457015	17.51355	0.221804	13.73242	3.702808
-2.9	172.1402	4.721124	17.31241	0.237789	17.0491	3.870172
-2.8	171.0494	5.084459	17.2572	0.256554	17.93825	4.159542
-2.7	170.9183	5.907137	17.24988	0.299977	18.03282	4.798191
-2.6	168.9712	5.943204	17.1513	0.301418	19.61929	4.834235
-2.5	172.4026	4.162686	17.32598	0.208715	16.84037	3.42972
-2.4	159.1674	6.592861	16.64532	0.344143	27.43267	5.183815
-2.3	161.5494	4.397118	16.77141	0.229094	25.59201	3.465051

-2.2	154.0308	3.838309	16.37673	0.204632	31.4626	2.939677
-2.1	158.7462	4.430783	16.62519	0.232906	27.79767	3.453931
-2	148.3211	8.414993	16.06513	0.457412	35.70339	6.28493
-1.9	150.1714	4.120506	16.16999	0.222477	34.40024	3.104433
-1.8	143.3639	5.771986	15.79754	0.318439	39.43917	4.224964
-1.7	145.2764	9.343167	15.89759	0.512389	37.93957	6.895599
-1.6	143.6194	7.093555	15.80998	0.391947	39.22195	5.181423
-1.5	134.0917	3.926792	15.27958	0.22436	46.10755	2.73262
-1.4	128.9412	7.269435	14.9788	0.428318	49.57247	4.823407
-1.3	118.0879	8.392028	14.33125	0.513234	56.62259	5.223166
-1.2	127.9194	4.990006	14.92255	0.291717	50.32244	3.352162
-1.1	122.3133	4.721216	14.59197	0.281391	54.03548	3.072732
-1	113.2206	7.936048	14.03298	0.497199	59.64041	4.725583
-0.9	99.10171	9.470007	13.12279	0.614706	67.57105	5.263171
-0.8	107.7594	4.722384	13.69553	0.303675	62.97535	2.668194
-0.7	95.85671	5.921187	12.91404	0.400029	69.40174	2.996812
-0.6	95.10411	11.99755	12.84298	0.827526	69.41204	5.773229
-0.5	94.79346	11.78374	12.82265	0.815721	69.58097	5.64232
-0.4	90.6648	9.971048	12.54648	0.692719	71.71683	4.697303
-0.3	88.95258	8.30949	12.43299	0.575727	72.62173	3.939705
-0.2	74.08112	5.940134	11.34919	0.455507	78.68563	2.011406
-0.1	79.2385	7.072667	11.73528	0.526106	76.76994	2.694142
0	81.17857	7.797493	11.87619	0.573403	75.97008	3.096532
0.1	90.94094	10.11053	12.56473	0.708964	71.56998	4.669161
0.2	84.67892	9.153947	12.12539	0.666616	74.4349	3.769078

0.3	99.42616	11.08231	13.13789	0.740352	67.28232	5.77615
0.4	89.61538	8.642089	12.47791	0.605966	72.28945	3.970528
0.5	98.50788	6.899142	13.08967	0.458479	67.99908	3.628795
0.6	93.5093	6.815221	12.75211	0.478402	70.52631	3.121907
0.7	101.7321	9.610466	13.29535	0.632513	66.14827	5.167591
0.8	113.9524	6.583544	14.08119	0.406787	59.24818	4.023018
0.9	119.5447	6.125269	14.42394	0.365718	55.78192	3.975257
1	121.975	8.39253	14.56594	0.500689	54.14827	5.4543
1.1	124.0393	4.390856	14.69498	0.26076	52.91483	2.874572
1.2	127.5604	7.537692	14.89793	0.441923	50.49702	5.041391
1.3	146.2706	7.2049	15.95531	0.392873	37.26448	5.358198
1.4	142.6114	6.116811	15.75551	0.34233	39.98055	4.389119
1.5	148.2451	2.420434	16.06692	0.131813	35.8685	1.802881
1.6	149.1081	6.351194	16.11051	0.344562	35.16329	4.755788
1.7	144.8276	5.040852	15.8788	0.275837	38.37736	3.731083
1.8	149.6674	4.367065	16.14265	0.235234	34.77758	3.300495
1.9	152.1805	7.553145	16.27435	0.404364	32.81134	5.754737
2	163.3444	6.566522	16.86255	0.337127	24.13397	5.266753
2.1	155.5704	6.8288	16.45569	0.362546	30.22645	5.257759
2.2	170.1035	6.046917	17.20863	0.304336	18.69674	4.961263
2.3	168.4949	8.158714	17.12475	0.41488	19.96295	6.616763
2.4	166.4236	4.576854	17.02253	0.233447	21.6993	3.698495
2.5	168.8815	4.167332	17.14808	0.210941	19.71666	3.397139
2.6	163.1511	2.360944	16.85546	0.122136	24.34095	1.87637
2.7	167.8045	5.347761	17.09243	0.272929	20.57395	4.31852

2.8	177.3598	4.933793	17.57288	0.244088	12.7262	4.125282
2.9	175.5164	4.024649	17.48185	0.201069	14.27042	3.329182
3	182.1443	5.780564	17.80779	0.284373	8.692935	4.862958
3.1	177.4702	4.720115	17.5785	0.233685	12.63657	3.943495
3.2	178.9477	3.773292	17.65208	0.186808	11.41028	3.152494
3.3	180.584	5.584074	17.73149	0.273731	10.01403	4.715418
3.4	182.1029	3.20097	17.80732	0.156923	8.756628	2.702699
3.5	184.2362	4.554523	17.91064	0.22267	6.932352	3.856842
3.6	184.9474	2.869502	17.94602	0.13975	6.341111	2.439677
3.7	186.3903	1.630554	18.01626	0.078667	5.113729	1.399918
3.8	185.7552	4.221566	17.98453	0.206775	5.639191	3.567779
3.9	189.9184	2.777451	18.18565	0.132964	2.06989	2.403561
4	187.7021	0.862234	18.07966	0.04152	3.989787	0.741715
4.1	189.8907	1.5407	18.18466	0.073816	2.099892	1.33221
4.2	188.5444	1.792176	18.12003	0.086071	3.261626	1.545875
4.3	188.7861	1.754661	18.13165	0.084329	3.053368	1.512427
4.4	190.6985	0.606856	18.22343	0.028988	1.402514	0.526316
4.5	191.0575	0.920057	18.24054	0.043896	1.090568	0.798938
4.6	189.877	1.305122	18.18405	0.062711	2.112547	1.125191
4.7	190.8504	0.693257	18.23068	0.033132	1.270701	0.600949
4.8	190.298	0.708388	18.20427	0.033874	1.749429	0.613716
4.9	190.5397	0.562686	18.21584	0.026882	1.540273	0.48795
5	189.5455	0.684198	18.16825	0.032826	2.400601	0.590766
5.1	191.5684	0.693976	18.26494	0.033075	0.647304	0.60325
5.2	190.3326	0.63354	18.20593	0.030304	1.719607	0.548709

5.3	190.2981	0.484791	18.20429	0.023174	1.749689	0.420148
5.4	190.4155	0.465468	18.20991	0.022243	1.648023	0.40354
5.5	189.801	0.365108	18.18051	0.01748	2.180033	0.315937
5.6	190.3049	0.409545	18.20462	0.019581	1.743852	0.354868
5.7	190.8711	0.821738	18.23165	0.039246	1.25252	0.71281
5.8	190.2774	0.917362	18.20327	0.043981	1.766928	0.792675
5.9	190.6916	0.607307	18.2231	0.029006	1.408562	0.526783
6	190.2014	0.628685	18.19966	0.030081	1.833233	0.544327
6.1	190.9678	0.522096	18.23629	0.024923	1.169101	0.453109
6.2	190.084	0.421841	18.19405	0.020185	1.935131	0.365234
6.3	191.4234	0.574056	18.25803	0.027398	0.773456	0.498296
6.4	190.1945	0.386077	18.19934	0.01846	1.839533	0.334512
6.5	190.3326	0.31617	18.20595	0.015117	1.719994	0.273941
6.6	190.084	0.235926	18.19406	0.011283	1.935271	0.204374
6.7	190.2429	0.371403	18.20166	0.017773	1.797642	0.321522
6.8	191.0714	0.355564	18.24125	0.016984	1.079336	0.308388
6.9	191.0851	0.620648	18.24189	0.029627	1.067128	0.538645
7	190.8918	0.654241	18.23266	0.031234	1.23486	0.567737

540 RPM						
Avg y position	Avg model pressure	STD Pressure	Avg U∞	STD U∞	Avg U∞(U∞max-U∞)	STD U∞(U∞max-U∞)
-7	293.7009	1.335832	22.61562	0.051458	0.629185	1.161099
-6.9	293.1762	0.602672	22.59546	0.023217	1.086344	0.523825
-6.8	293.9357	1.215892	22.62467	0.046804	0.425222	1.057614
-6.7	294.4121	1.276506	22.64299	0.049082	0.010479	1.111599
-6.6	293.3627	1.287168	22.6026	0.049529	0.923361	1.120052
-6.5	291.3121	0.824666	22.5235	0.03188	2.703183	0.714242
-6.4	292.3409	0.618319	22.56324	0.023856	1.811652	0.536588
-6.3	291.395	1.12111	22.52668	0.04332	2.630994	0.971449
-6.2	291.9818	1.147134	22.54935	0.044324	2.12235	0.994028
-6.1	292.189	0.940464	22.55736	0.036311	1.943053	0.815561
-6	292.6585	1.071134	22.57547	0.041315	1.535411	0.929824
-5.9	291.616	1.136715	22.53522	0.0439	2.439527	0.985498
-5.8	292.762	1.541699	22.57942	0.059457	1.444619	1.3385
-5.7	290.7046	1.454897	22.49995	0.056319	3.228033	1.258379
-5.6	291.6919	1.542761	22.53812	0.059648	2.372921	1.33603
-5.5	290.318	1.385381	22.48499	0.053683	3.562557	1.197008
-5.4	290.3871	0.68198	22.48771	0.026402	3.503881	0.589819
-5.3	288.4676	2.012724	22.41315	0.078388	5.158097	1.730099
-5.2	288.9992	0.883985	22.4339	0.03432	4.702252	0.762305
-5.1	290.8772	0.831779	22.50667	0.032189	3.079765	0.719639
-5	290.3524	1.101181	22.48635	0.042638	3.533271	0.952179
-4.9	288.3917	1.611382	22.41025	0.062615	5.224635	1.388338
-4.8	289.4687	2.100324	22.45199	0.081495	4.294397	1.812312
-4.7	291.036	1.867662	22.51273	0.07213	2.940198	1.619182

-4.6	288.4953	1.871748	22.41424	0.072593	5.134699	1.615813
-4.5	288.0189	2.537399	22.39563	0.098729	5.542875	2.183226
-4.4	285.706	1.488167	22.30567	0.058139	7.533553	1.275107
-4.3	286.0788	1.932471	22.32016	0.075347	7.212588	1.659195
-4.2	285.6853	4.808369	22.30414	0.188698	7.535114	4.100834
-4.1	286.2307	1.988386	22.32608	0.077428	7.082088	1.709448
-4	286.4447	3.233354	22.33421	0.12602	6.89337	2.77725
-3.9	279.368	5.231223	22.05598	0.20692	12.9172	4.42471
-3.8	288.8612	3.486647	22.42816	0.135779	4.812644	2.997369
-3.7	274.7837	8.293017	21.8727	0.333466	16.75056	6.891958
-3.6	278.5258	4.34405	22.023	0.172179	13.63718	3.666281
-3.5	283.6555	6.450512	22.22411	0.254896	9.257637	5.461781
-3.4	268.4733	6.716625	21.6209	0.270618	22.03819	5.569232
-3.3	274.3556	3.34467	21.85777	0.133123	17.15793	2.810286
-3.2	264.1928	4.051418	21.44889	0.164193	25.59757	3.337504
-3.1	272.1256	10.63198	21.76504	0.425743	18.94159	8.875268
-3	259.3185	8.616152	21.24783	0.352107	29.53337	7.03259
-2.9	266.119	6.717306	21.52588	0.270775	23.98642	5.566911
-2.8	261.8178	5.409049	21.35176	0.22011	27.53418	4.435775
-2.7	255.5834	9.662256	21.09329	0.404395	32.53843	7.670111
-2.6	254.9413	5.738585	21.0693	0.235931	33.11344	4.651413
-2.5	258.9043	5.309666	21.23264	0.217878	29.91058	4.313217
-2.4	250.6469	5.624125	20.89109	0.234396	36.55661	4.486889
-2.3	245.6691	8.518803	20.68081	0.358753	40.46382	6.712411
-2.2	231.4673	11.42733	20.07113	0.493646	51.39032	8.723868

-2.1	238.475	7.860131	20.37606	0.334982	46.09153	6.103526
-2	230.1555	6.988543	20.01791	0.302286	52.46959	5.326062
-1.9	228.4916	12.85073	19.93979	0.563414	53.59835	9.623206
-1.8	230.3143	8.673459	20.02353	0.378176	52.32056	6.543515
-1.7	215.9745	7.306599	19.39083	0.328655	62.96615	5.282445
-1.6	213.9792	10.20595	19.2982	0.467214	64.34332	7.196648
-1.5	212.4326	7.739718	19.23075	0.3502	65.50938	5.549411
-1.4	195.0895	8.223294	18.42801	0.388394	77.53483	5.527026
-1.3	191.1887	5.848464	18.24475	0.278791	80.17821	3.873148
-1.2	181.4056	6.900528	17.77072	0.336701	86.48155	4.393828
-1.1	173.2104	7.749834	17.36339	0.391812	91.52964	4.625173
-1	175.6544	9.468682	17.48354	0.472772	89.99411	5.786056
-0.9	167.1486	14.38968	17.0445	0.757304	94.86535	7.933936
-0.8	152.8364	13.45309	16.29823	0.729184	102.8912	6.932601
-0.7	160.2445	12.24495	16.69304	0.637152	98.93029	6.912415
-0.6	155.6533	11.90834	16.45234	0.623327	101.4754	6.631353
-0.5	129.6869	5.993086	15.02418	0.34609	114.3563	2.600682
-0.4	126.0553	15.24762	14.79027	0.880959	115.3839	6.629062
-0.3	145.8632	18.24215	15.9083	0.975095	106.2052	9.707124
-0.2	127.3395	14.18313	14.86918	0.819179	114.9343	6.176483
-0.1	128.168	11.02029	14.92702	0.622665	114.8011	5.100546
0	124.4328	18.83481	14.67717	1.135181	115.6483	7.184779
0.1	130.4118	10.75812	15.05707	0.628972	113.8386	4.514504
0.2	129.4245	17.67876	14.98087	0.985404	113.8324	8.513411
0.3	131.6408	8.793798	15.13259	0.504595	113.4083	3.89429

0.4	142.0314	8.343814	15.72045	0.460349	108.6246	4.10984
0.5	141.1753	7.132015	15.67468	0.396717	109.0791	3.440716
0.6	163.2823	14.90917	16.84496	0.77675	97.07988	8.393386
0.7	149.6674	14.39593	16.12567	0.780201	104.5026	7.417534
0.8	163.9796	7.80281	16.8939	0.402271	96.97392	4.480981
0.9	175.8064	11.06528	17.48875	0.553789	89.8475	6.737141
1	176.5658	12.57473	17.52442	0.617308	89.33268	7.927444
1.1	191.5408	8.92652	18.25872	0.426654	79.88135	5.885817
1.2	188.3649	10.5862	18.10448	0.510397	81.91968	6.881283
1.3	209.6849	6.928955	19.10653	0.315611	67.4817	4.920621
1.4	201.5932	6.242515	18.73459	0.287801	73.1509	4.354699
1.5	219.9374	9.856591	19.5658	0.440603	60.02666	7.191214
1.6	213.1576	9.234217	19.26213	0.421712	64.95741	6.534753
1.7	223.2376	14.79623	19.70636	0.650626	57.4624	11.0394
1.8	233.3383	7.278777	20.15569	0.314152	50.0469	5.562438
1.9	231.5433	5.900107	20.07884	0.254154	51.43262	4.520038
2	241.8511	4.763888	20.52155	0.201786	43.50654	3.727083
2.1	240.7878	3.94065	20.47669	0.167917	44.34234	3.060295
2.2	244.6887	9.841245	20.63838	0.418079	41.2105	7.673251
2.3	241.8097	8.692945	20.51751	0.367826	43.4872	6.81092
2.4	242.6381	12.31719	20.54926	0.524971	42.76339	9.564136
2.5	253.7262	6.27106	21.01874	0.260046	34.08467	5.032646
2.6	260.9686	3.163447	21.31784	0.129227	28.24496	2.582869
2.7	262.8741	5.103463	21.39491	0.208542	26.67171	4.165573
2.8	263.9581	7.34395	21.43791	0.299708	25.75767	6.003086

2.9	265.622	5.532259	21.50629	0.224493	24.4085	4.551045
3	270.9933	7.053322	21.722	0.28326	19.93874	5.869281
3.1	276.4752	6.807818	21.94079	0.271311	15.34645	5.712492
3.2	270.586	7.567659	21.70541	0.302407	20.27243	6.331616
3.3	279.2714	4.531269	22.05241	0.17899	13.00455	3.838161
3.4	268.2386	6.858676	21.61137	0.277161	22.231	5.668456
3.5	277.2899	4.594068	21.974	0.182443	14.67984	3.869411
3.6	285.6231	2.94852	22.30221	0.115202	7.599666	2.526155
3.7	285.6853	2.881844	22.30465	0.112524	7.546623	2.470693
3.8	284.6635	2.690217	22.26476	0.105324	8.422809	2.300009
3.9	283.2205	4.994665	22.20765	0.195814	9.642513	4.264146
4	288.1293	1.027795	22.4001	0.039955	5.451851	0.885154
4.1	287.653	2.042951	22.38147	0.079506	5.859551	1.757434
4.2	286.6794	2.317633	22.34353	0.090288	6.695677	1.99164
4.3	290.1108	1.066454	22.47699	0.041326	3.7422	0.921415
4.4	288.4193	2.639024	22.41117	0.102712	5.197529	2.270022
4.5	291.1947	0.855533	22.51896	0.033067	2.804822	0.741113
4.6	289.6828	1.598611	22.46036	0.061979	4.110956	1.380508
4.7	291.3605	0.904973	22.52536	0.03497	2.66119	0.784131
4.8	289.5378	0.707005	22.4548	0.027416	4.237682	0.610437
4.9	289.9037	1.612218	22.46892	0.062475	3.920076	1.392964
5	292.5687	1.09417	22.57201	0.042219	1.613304	0.949465
5.1	291.181	1.432582	22.51838	0.055434	2.815682	1.239558
5.2	291.5952	0.695502	22.53444	0.02688	2.45809	0.60254
5.3	290.9877	0.958506	22.51094	0.037068	2.983949	0.829858

5.4	291.6435	0.696526	22.53631	0.026931	2.416243	0.603155
5.5	291.5607	0.508961	22.53312	0.019668	2.488204	0.440972
5.6	293.3489	0.493009	22.60211	0.018997	0.936396	0.428392
5.7	293.0451	1.025084	22.59038	0.039548	1.199789	0.889645
5.8	292.8103	0.660804	22.58135	0.02548	1.404144	0.57381
5.9	292.5618	0.31228	22.57177	0.012049	1.620151	0.271002
6	293.0727	0.728063	22.59146	0.028074	1.17619	0.632199
6.1	293.4455	0.475799	22.60584	0.018328	0.852417	0.413581
6.2	294.0462	0.681983	22.62895	0.026256	0.329835	0.593127
6.3	293.8736	0.63613	22.62231	0.0245	0.480029	0.553036
6.4	293.4318	0.41682	22.60531	0.016051	0.864412	0.362425
6.5	293.9772	0.486712	22.6263	0.018728	0.390038	0.423516
6.6	292.9691	0.735101	22.58747	0.028327	1.266137	0.638729
6.7	294.4259	0.710576	22.64356	0.027318	-0.00074	0.618871
6.8	293.5836	0.543763	22.61115	0.020946	0.73229	0.472646
6.9	293.8528	0.45479	22.62152	0.017502	0.49823	0.395689
7	293.8666	0.822372	22.62204	0.03165	0.485878	0.715463

640 RPM						
Avg y position	Avg model pressure	STD Pressure	Avg U∞	STD U∞	Avg U∞(U∞max-U∞)	STD U∞(U∞max-U∞)
-7	417.6919	1.489993	26.97021	0.048138	1.174783	1.294369
-6.9	418.2788	2.297034	26.98909	0.074179	0.66286	1.996345
-6.8	418.0026	0.928966	26.98026	0.029976	0.90532	0.808001
-6.7	416.684	1.272712	26.93766	0.041146	2.050781	1.104876
-6.6	416.0833	2.39392	26.91816	0.077468	2.570006	2.076223
-6.5	419.0451	1.651485	27.01385	0.05324	-0.00281	1.437788
-6.4	416.5114	0.879782	26.9321	0.028431	2.201091	0.764087
-6.3	414.5505	1.823019	26.86858	0.059047	3.899906	1.579625
-6.2	415.1305	1.670199	26.88738	0.054074	3.397734	1.447846
-6.1	415.89	2.123725	26.91193	0.068668	2.738368	1.843389
-6	415.7174	1.423779	26.90639	0.046103	2.889361	1.234042
-5.9	413.8463	1.400439	26.84577	0.045384	4.510221	1.212804
-5.8	413.66	1.625295	26.83971	0.052713	4.671096	1.406407
-5.7	414.0673	1.820077	26.85291	0.059051	4.318286	1.574391
-5.6	414.5644	0.970521	26.86907	0.03145	3.889129	0.840529
-5.5	413.6875	1.459608	26.84062	0.047316	4.647502	1.263662
-5.4	415.0477	1.339809	26.88471	0.043376	3.470007	1.161469
-5.3	413.8049	1.053766	26.84444	0.034158	4.546499	0.912365
-5.2	413.1283	2.394418	26.8224	0.077732	5.129229	2.06995
-5.1	413.4114	1.150105	26.83167	0.037326	4.886792	0.994551
-5	414.5022	1.324584	26.86704	0.042912	3.942565	1.147498
-4.9	412.3412	1.452262	26.79691	0.047167	5.811257	1.254896
-4.8	414.6541	2.033077	26.87192	0.065901	3.809792	1.760278

-4.7	411.4023	1.772039	26.76636	0.057673	6.621202	1.527973
-4.6	410.5876	1.12446	26.73988	0.036612	7.324621	0.969169
-4.5	412.3206	1.751661	26.79622	0.056928	5.828612	1.512594
-4.4	409.0825	4.687915	26.69042	0.153123	8.609449	4.027401
-4.3	409.5313	3.646308	26.70522	0.118907	8.227985	3.137784
-4.2	410.0283	3.91117	26.72139	0.127766	7.798962	3.35972
-4.1	404.0356	5.145961	26.52516	0.169168	12.93425	4.391698
-4	404.2842	2.60299	26.53372	0.085485	12.73252	2.223736
-3.9	408.3576	2.813	26.66703	0.091946	9.240268	2.414936
-3.8	401.1428	6.152346	26.42979	0.203456	15.39565	5.217981
-3.7	397.7046	6.066042	26.3163	0.200109	18.31739	5.158131
-3.6	398.1809	6.048329	26.33206	0.199957	17.91352	5.131407
-3.5	398.5399	6.829807	26.34372	0.225176	17.60349	5.811059
-3.4	389.6337	11.69199	26.0457	0.394033	25.06254	9.717326
-3.3	392.4781	5.087697	26.14302	0.169166	22.73799	4.290294
-3.2	375.563	12.4713	25.57054	0.421653	36.73023	10.32821
-3.1	380.0714	4.017949	25.72667	0.135931	33.09666	3.325108
-3	384.6627	8.343897	25.88045	0.280364	29.25526	6.957018
-2.9	373.4021	5.111678	25.49971	0.175058	38.57994	4.172916
-2.8	373.264	5.07913	25.495	0.17387	38.69324	4.148259
-2.7	360.7468	16.31051	25.05812	0.566079	48.68966	13.11329
-2.6	357.8263	13.63311	24.95832	0.474658	51.07956	10.92014
-2.5	351.9993	4.736744	24.75815	0.166568	55.81962	3.749296
-2.4	345.544	11.68648	24.52711	0.4175	60.82008	9.074316
-2.3	340.6352	9.616254	24.35334	0.344865	64.67453	7.430528

-2.2	343.9836	14.26162	24.46995	0.5086	61.99318	11.09711
-2.1	340.5592	11.46604	24.34958	0.412693	64.70524	8.819403
-2	327.607	9.381991	23.88301	0.343862	74.65695	7.050326
-1.9	329.7957	7.690484	23.96351	0.278661	73.02012	5.865256
-1.8	315.8286	12.1963	23.44783	0.452439	83.4128	9.018433
-1.7	303.5255	10.11369	22.9876	0.386715	92.40574	7.16726
-1.6	295.9517	12.04821	22.69757	0.459149	97.76035	8.579396
-1.5	295.5237	7.08087	22.68413	0.272619	98.1425	4.967052
-1.4	282.9374	11.72516	22.19259	0.464712	106.7826	7.869161
-1.3	259.8156	11.20553	21.26622	0.456783	122.0238	7.17781
-1.2	256.8951	12.22182	21.14537	0.498661	123.845	7.815869
-1.1	268.8807	9.157566	21.63588	0.367853	116.2232	6.011963
-1	227.0832	9.435787	19.88181	0.414599	141.6277	5.234137
-0.9	238.2955	14.18571	20.3623	0.602376	135.0817	8.434137
-0.8	213.489	13.57148	19.27204	0.612535	148.8291	7.094464
-0.7	218.453	13.91068	19.49466	0.624407	146.1982	7.364201
-0.6	207.6343	18.78814	18.99624	0.85881	151.5744	9.547356
-0.5	200.6818	30.18057	18.64135	1.414172	154.0949	14.40587
-0.4	189.0691	10.64322	18.13841	0.507357	160.7316	4.835232
-0.3	176.8074	18.50986	17.52417	0.902736	165.492	7.873456
-0.2	189.725	20.76561	18.15059	0.982189	159.9184	9.702806
-0.1	164.4767	12.66157	16.9124	0.636046	170.4393	4.884971
0	166.6653	15.91004	17.01707	0.816913	169.4553	5.676301
0.1	171.8572	19.39368	17.27309	0.965655	167.3299	7.715035
0.2	171.0494	16.37589	17.23942	0.827758	167.8272	6.19537

0.3	172.9135	17.11131	17.33247	0.845645	167.0943	6.991442
0.4	182.7174	11.96561	17.82849	0.586287	163.4209	5.013201
0.5	198.4863	15.97657	18.57716	0.742247	156.1844	7.801794
0.6	201.7728	14.30378	18.73337	0.667031	154.6809	6.906156
0.7	220.4069	10.7987	19.58572	0.481851	145.2555	5.790883
0.8	213.2336	16.60025	19.2559	0.744284	148.8379	8.809981
0.9	233.939	8.333399	20.18083	0.362051	137.7663	4.733264
1	224.9705	12.79912	19.78526	0.569322	142.6986	6.918604
1.1	259.5325	11.35201	21.25438	0.468258	122.1969	7.120378
1.2	267.7622	15.90238	21.584	0.657956	116.7694	9.927386
1.3	285.1468	9.131154	22.28105	0.357892	105.3249	6.234203
1.4	282.6959	11.83473	22.18316	0.462229	106.9486	8.124606
1.5	290.5665	20.82949	22.48013	0.812758	101.2646	14.32968
1.6	304.1469	14.21644	23.00807	0.540227	91.87641	10.16666
1.7	305.8937	8.839517	23.07796	0.33285	90.72263	6.402773
1.8	318.0517	10.01716	23.53165	0.371168	81.80559	7.418314
1.9	339.4684	18.94536	24.30463	0.678575	65.39069	14.66468
2	337.2175	8.518075	24.23133	0.308412	67.3301	6.502669
2.1	329.7473	9.298052	23.961	0.337195	73.03675	7.083511
2.2	343.2794	7.175902	24.44879	0.255637	62.64803	5.591046
2.3	356.991	8.940813	24.93164	0.316508	51.81369	7.020405
2.4	348.3125	3.827085	24.62833	0.135426	58.73322	3.00634
2.5	363.1356	10.28482	25.1448	0.356524	46.87113	8.27995
2.6	347.8568	7.601864	24.61113	0.268332	59.06233	5.990056
2.7	371.5656	8.241561	25.43596	0.282465	40.05617	6.722034

2.8	376.6677	11.60402	25.60853	0.396372	35.83271	9.501097
2.9	374.6103	14.90588	25.53651	0.508863	37.4699	12.21326
3	380.1336	6.401368	25.72822	0.216992	33.03038	5.286044
3.1	383.7513	7.690465	25.84998	0.259321	30.01942	6.387513
3.2	383.0126	9.016735	25.82461	0.303694	30.62045	7.49856
3.3	390.8557	6.856828	26.08847	0.228833	24.08996	5.759451
3.4	400.7217	5.850854	26.41599	0.192408	15.75636	4.991454
3.5	398.7816	6.464702	26.3518	0.214597	17.40076	5.461058
3.6	403.4556	7.795892	26.50541	0.257434	13.41081	6.622175
3.7	402.351	6.994475	26.46934	0.230663	14.36011	5.949597
3.8	404.6501	5.22614	26.54531	0.171257	12.40855	4.474864
3.9	402.7653	4.72755	26.48351	0.155368	14.02141	4.035791
4	406.0585	6.043617	26.59128	0.198445	11.19765	5.164
4.1	408.7166	3.453789	26.67867	0.112804	8.929501	2.967401
4.2	411.3816	2.236905	26.76565	0.072787	6.638058	1.929218
4.3	412.4725	1.82932	26.80115	0.059459	5.697223	1.579477
4.4	410.6567	1.747732	26.74209	0.056904	7.264165	1.50641
4.5	411.2158	3.149432	26.76016	0.1025	6.778426	2.715705
4.6	412.9488	1.346472	26.81665	0.043706	5.286457	1.164163
4.7	412.1618	1.011154	26.7911	0.032878	5.966803	0.872724
4.8	410.5048	1.196133	26.73718	0.038929	7.39591	1.031411
4.9	412.7348	1.113039	26.80971	0.036157	5.471734	0.961588
5	410.5462	1.13647	26.73853	0.037025	7.360295	0.978934
5.1	410.8706	1.25649	26.74909	0.040879	7.080511	1.083818
5.2	412.217	1.167381	26.79288	0.037938	5.918965	1.008105

5.3	409.4001	1.150189	26.70118	0.037515	8.347242	0.989578
5.4	412.5484	1.928013	26.80361	0.062607	5.631444	1.666311
5.5	414.4885	1.762927	26.86657	0.057185	3.953765	1.525276
5.6	413.722	1.04366	26.84176	0.033854	4.618212	0.902956
5.7	413.0525	1.658395	26.82	0.053843	5.196387	1.433528
5.8	413.0938	1.00172	26.82137	0.032524	5.161527	0.865864
5.9	411.7268	0.710488	26.77697	0.023104	6.342558	0.613168
6	412.2308	1.646368	26.79331	0.053535	5.906289	1.4209
6.1	414.806	1.224243	26.87689	0.039635	3.679596	1.061266
6.2	413.6737	0.803891	26.8402	0.026084	4.660242	0.695314
6.3	413.2733	1.06528	26.82719	0.034583	5.006326	0.920917
6.4	412.9419	0.64684	26.81645	0.021003	5.293177	0.559083
6.5	413.6323	1.534244	26.83882	0.049741	4.695195	1.328135
6.6	412.9557	0.845296	26.81689	0.027436	5.281068	0.730898
6.7	413.3079	0.741658	26.82833	0.02407	4.976707	0.641357
6.8	414.661	1.925709	26.87215	0.062383	3.804016	1.668337
6.9	415.4274	1.359938	26.89701	0.044002	3.140905	1.179613
7	413.5564	0.715072	26.83639	0.023194	4.761813	0.618699

740 RPM						
Avg y position	Avg model pressure	STD Pressure	Avg U∞	STD U∞	Avg U∞(U∞max-U∞)	STD U∞(U∞max-U∞)
-7	559.102	0.910804	31.20343	0.025418	1.755879	0.791559
-6.9	560.9799	1.727258	31.25576	0.048123	0.121462	1.503635
-6.8	560.3102	2.44882	31.23706	0.068277	0.703228	2.130219
-6.7	556.9203	1.997705	31.14245	0.05584	3.649031	1.733392
-6.6	559.3782	2.0744	31.21109	0.057876	1.514461	1.803314
-6.5	561.1248	3.049055	31.25972	0.084919	-0.00714	2.655261
-6.4	559.1849	2.937906	31.20565	0.081817	1.680867	2.558676
-6.3	555.9675	2.81124	31.11575	0.078714	4.473623	2.435095
-6.2	556.1402	1.59679	31.12065	0.044699	4.326082	1.383481
-6.1	555.9054	2.258474	31.11405	0.063202	4.528555	1.957385
-6	555.4635	1.316205	31.10172	0.036843	4.912752	1.140425
-5.9	556.0296	1.765043	31.11755	0.049411	4.421671	1.52919
-5.8	553.0885	2.855414	31.03508	0.080119	6.965527	2.468095
-5.7	557.0101	2.508937	31.14493	0.070117	3.570278	2.177389
-5.6	555.9123	0.858566	31.1143	0.024029	4.524273	0.744006
-5.5	554.2967	2.602448	31.06897	0.072885	5.921102	2.253695
-5.4	554.0965	1.578998	31.06342	0.044258	6.096017	1.366278
-5.3	551.6732	1.550091	30.99542	0.043549	8.190421	1.338101
-5.2	550.5133	1.838989	30.9628	0.051721	9.190849	1.585748
-5.1	552.7019	2.306861	31.02426	0.064783	7.300758	1.99223
-5	551.2658	2.356423	30.98393	0.066256	8.540799	2.032484
-4.9	553.1644	1.421862	31.03729	0.039907	6.902279	1.228624
-4.8	552.3014	1.299341	31.01307	0.036476	7.64816	1.122523

-4.7	550.1956	1.7922	30.95387	0.050422	9.464829	1.544874
-4.6	554.8145	2.314909	31.0835	0.064818	5.473424	2.005133
-4.5	548.7044	2.861173	30.91183	0.080581	10.74755	2.463694
-4.4	547.3374	3.271792	30.87327	0.092344	11.92271	2.811043
-4.3	548.7596	4.244639	30.91326	0.119838	10.69612	3.64578
-4.2	546.9852	6.449602	30.86294	0.182327	12.21304	5.53229
-4.1	547.441	6.729556	30.87574	0.190436	11.81974	5.766381
-4	540.0052	7.004062	30.66528	0.19875	18.18976	5.984506
-3.9	541.7796	8.200214	30.71538	0.232809	16.66595	7.002898
-3.8	543.7955	12.00991	30.77148	0.340882	14.9089	10.25915
-3.7	533.4394	6.84609	30.47829	0.195959	23.7787	5.796689
-3.6	526.6319	10.94145	30.28218	0.315947	29.50326	9.177978
-3.5	534.5579	12.26259	30.50885	0.351554	22.78604	10.36569
-3.4	523.4423	16.43902	30.18824	0.476591	32.12132	13.7304
-3.3	519.1755	5.450486	30.06825	0.157397	35.80095	4.571647
-3.2	513.1275	10.3597	29.89148	0.303261	40.80767	8.561523
-3.1	517.0283	8.119888	30.00549	0.236457	37.57843	6.749002
-3	503.7586	10.96039	29.61711	0.322681	48.54639	9.000691
-2.9	498.691	8.563027	29.46842	0.25305	52.72344	7.002088
-2.8	496.8614	5.731074	29.4149	0.169487	54.23672	4.682416
-2.7	484.3028	10.32548	29.03962	0.310248	64.37567	8.283556
-2.6	456.6312	9.018745	28.19803	0.278143	86.25704	7.011567
-2.5	472.7177	13.53958	28.68888	0.412087	73.58656	10.69765
-2.4	459.7449	10.95719	28.29339	0.336503	83.81547	8.563138
-2.3	442.3051	13.86804	27.75008	0.438336	97.20255	10.44879

-2.2	454.3045	9.263181	28.12601	0.286483	88.05752	7.176284
-2.1	447.4141	7.423311	27.91238	0.232496	93.37874	5.659913
-2	436.8646	11.9765	27.57975	0.376274	101.3525	9.094877
-1.9	421.4063	8.332812	27.08859	0.268046	112.9189	6.132344
-1.8	422.9943	5.56634	27.14031	0.179724	111.7702	4.075517
-1.7	415.9383	6.235711	26.91283	0.20146	116.947	4.561811
-1.6	390.904	12.95125	26.0875	0.434085	134.7438	8.986377
-1.5	377.9726	8.301091	25.65435	0.282512	143.7232	5.625065
-1.4	382.0529	19.11766	25.78602	0.644714	140.7334	13.1422
-1.3	355.5411	11.12523	24.87996	0.387458	158.5796	7.263365
-1.2	348.2987	12.29315	24.62443	0.43371	163.2041	7.852806
-1.1	328.0351	18.12219	23.89212	0.656877	175.6005	11.02955
-1	312.7633	13.42951	23.33281	0.497597	184.712	7.83435
-0.9	303.6291	12.05796	22.99025	0.457324	189.9103	6.704627
-0.8	298.7341	14.06775	22.80235	0.538185	192.5612	7.67832
-0.7	288.4953	18.41119	22.40311	0.713528	197.9116	9.762772
-0.6	265.2836	15.46626	21.48469	0.62715	209.6242	7.334938
-0.5	270.6965	12.15965	21.70662	0.482203	207.1354	6.107789
-0.4	261.3621	17.9493	21.3217	0.736711	211.3582	8.251894
-0.3	227.815	10.87359	19.91252	0.474454	225.7286	4.106253
-0.2	235.1403	19.74786	20.21826	0.846793	222.5293	7.928122
-0.1	254.3337	28.77382	21.01167	1.198628	213.9064	12.70367
0	236.0171	24.00574	20.2468	1.04534	221.8946	9.170396
0.1	246.8497	17.16847	20.72134	0.714489	217.8641	7.57106
0.2	232.0542	17.07219	20.08873	0.749711	223.8546	6.310909

0.3	262.7498	21.44785	21.37335	0.869702	210.5561	10.17916
0.4	248.2167	18.59451	20.77643	0.778422	217.2055	8.065135
0.5	252.366	19.0522	20.94921	0.788968	215.3808	8.537842
0.6	285.6577	12.43082	22.29854	0.489272	199.5843	6.354145
0.7	266.485	15.95577	21.53253	0.654178	209.0274	7.348015
0.8	290.1385	17.47043	22.46816	0.671976	197.0833	9.431922
0.9	304.4991	9.668854	23.02485	0.361712	189.4771	5.532222
1	331.0315	13.03449	24.00521	0.480479	173.9176	7.68158
1.1	335.8437	15.07702	24.1778	0.543709	170.9326	9.264479
1.2	360.4775	15.55332	25.04923	0.544812	155.2742	10.05742
1.3	373.6713	8.865022	25.50772	0.302351	146.63	5.987085
1.4	370.7854	13.72549	25.40651	0.469283	148.4917	9.234298
1.5	399.7136	18.66441	26.37635	0.614792	128.4314	13.29047
1.6	399.0577	21.68898	26.35214	0.716816	128.8167	15.36788
1.7	415.2617	8.219308	26.89037	0.266764	117.4231	5.974866
1.8	409.3725	12.962	26.69702	0.420912	121.6351	9.416299
1.9	435.6357	10.12906	27.54161	0.321672	102.3003	7.584476
2	452.7511	20.3849	28.07231	0.6307	89.08414	15.7862
2.1	436.9682	12.64849	27.58268	0.401163	101.2635	9.487517
2.2	468.0851	8.726333	28.54964	0.265948	77.30176	6.883315
2.3	462.1406	15.44061	28.36505	0.476012	81.88331	12.00982
2.4	468.0022	17.19204	28.5436	0.523049	77.25707	13.58992
2.5	492.284	13.54948	29.27686	0.400839	57.89292	11.06643
2.6	483.9231	12.05832	29.02765	0.361297	64.66266	9.70543
2.7	495.9017	8.549346	29.38588	0.25398	55.00063	6.949342

2.8	477.813	14.80082	28.84252	0.451955	69.51609	11.64813
2.9	503.5584	8.182418	29.612	0.240503	48.73516	6.73142
3	503.4962	7.187306	29.61039	0.211344	48.7932	5.909884
3.1	523.5941	11.36664	30.19456	0.329461	32.05459	9.496257
3.2	523.1315	6.192652	30.18248	0.178592	32.48238	5.201671
3.3	530.2428	7.814404	30.38664	0.223954	26.4804	6.60793
3.4	529.0484	9.199463	30.35208	0.263669	27.48006	7.778393
3.5	525.5066	18.12157	30.24695	0.523868	30.36166	15.18254
3.6	538.7487	4.356509	30.62997	0.123772	19.27413	3.717619
3.7	532.3969	11.26772	30.44741	0.324089	24.62884	9.491805
3.8	541.9384	6.542706	30.7202	0.185961	16.54004	5.580833
3.9	545.2178	8.512704	30.81263	0.241507	13.71839	7.27517
4	542.8359	4.040287	30.74598	0.114451	15.78271	3.458329
4.1	548.5249	4.841923	30.90658	0.13639	10.89606	4.168529
4.2	553.0954	2.843339	31.03527	0.07982	6.959562	2.456408
4.3	552.0875	1.822536	31.00704	0.051239	7.832342	1.572148
4.4	550.1888	3.446644	30.95357	0.096881	9.467273	2.973723
4.5	549.4431	5.281397	30.93238	0.149171	10.10346	4.534346
4.6	553.8825	0.889289	31.05744	0.024936	6.281794	0.769157
4.7	551.7492	1.893979	30.99754	0.053205	8.124365	1.635112
4.8	548.4972	3.320548	30.90596	0.093544	10.92478	2.858443
4.9	552.7156	0.875661	31.02471	0.024578	7.290664	0.75663
5	551.9217	2.020254	31.00238	0.056747	7.975161	1.744313
5.1	553.8618	1.705824	31.05683	0.047815	6.298877	1.475956
5.2	551.3141	3.968284	30.98516	0.111455	8.495071	3.426564

5.3	552.7295	1.1767	31.02509	0.033039	7.278471	1.016393
5.4	552.0598	1.36307	31.00628	0.038282	7.856786	1.177046
5.5	553.1783	2.593733	31.03762	0.07286	6.888428	2.239294
5.6	551.1415	1.32636	30.98049	0.037267	8.649528	1.144853
5.7	550.0438	1.089408	30.94962	0.030652	9.596511	0.938987
5.8	553.1852	1.491201	31.03786	0.041818	6.884279	1.289648
5.9	554.7041	1.966824	31.08043	0.055116	5.56959	1.702231
6	552.6536	2.118156	31.02292	0.059409	7.342861	1.831567
6.1	556.5268	1.217336	31.13148	0.034041	3.991326	1.055827
6.2	553.3094	1.355768	31.04136	0.038026	6.776997	1.172342
6.3	554.5728	1.930795	31.07675	0.054126	5.683274	1.670454
6.4	554.7317	0.953326	31.08124	0.026706	5.546889	0.825366
6.5	556.8167	1.950837	31.13956	0.054563	3.73897	1.691673
6.6	555.284	1.856701	31.09667	0.052012	5.067596	1.607479
6.7	554.8352	1.718265	31.08411	0.048151	5.456412	1.487102
6.8	555.8985	1.526291	31.11389	0.042734	4.535615	1.322118
6.9	556.4577	2.316354	31.1295	0.064755	4.04971	2.009607
7	553.7997	2.205012	31.05507	0.061762	6.351871	1.909297

340 RPM - 18cm						
Avg y position	Avg model pressure	STD Pressure	Avg U∞	STD U∞	Avg U∞(U∞max-U∞)	STD U∞(U∞max-U∞)
-7	111.0389	0.155306	13.90575	0.009722	1.752542	0.134039
-6.9	111.1493	0.355807	13.91265	0.022261	1.657031	0.307266
-6.8	110.9353	0.316178	13.89925	0.019807	1.841768	0.272684
-6.7	111.3426	0.632232	13.9247	0.039506	1.489612	0.546663
-6.6	110.9353	0.221204	13.89926	0.013848	1.841911	0.190912
-6.5	111.0734	0.277196	13.9079	0.017374	1.722659	0.23894
-6.4	111.0044	0.37979	13.90357	0.023809	1.782102	0.327305
-6.3	110.597	0.390598	13.87803	0.024526	2.13322	0.336075
-6.2	110.7557	0.317709	13.888	0.019952	1.996554	0.273317
-6.1	110.1827	0.385673	13.85202	0.024216	2.489569	0.331836
-6	110.0101	0.291463	13.84117	0.018335	2.637976	0.250302
-5.9	110.1482	0.382842	13.84985	0.024078	2.519251	0.32884
-5.8	110.5625	0.302745	13.87588	0.018988	2.163055	0.260783
-5.7	110.1137	0.340558	13.84768	0.021397	2.548965	0.292834
-5.6	110.2242	0.281443	13.85464	0.017664	2.454048	0.242265
-5.5	109.8168	0.325749	13.829	0.020498	2.803882	0.279662
-5.4	110.0515	0.501309	13.84375	0.031518	2.602101	0.430754
-5.3	109.3542	0.226925	13.79985	0.014321	3.200445	0.194231
-5.2	109.727	0.363288	13.82335	0.022882	2.880839	0.311583
-5.1	109.3474	0.585375	13.79938	0.036961	3.205727	0.50078
-5	109.2507	0.466709	13.7933	0.029459	3.288723	0.39939
-4.9	109.2507	0.724604	13.79325	0.045724	3.288107	0.620288
-4.8	109.3887	0.414249	13.80201	0.026132	3.170679	0.354723

-4.7	109.5406	0.752582	13.81154	0.047498	3.039782	0.644109
-4.6	109.5752	0.599727	13.81375	0.037787	3.010562	0.514186
-4.5	110.0584	0.952647	13.8441	0.059901	2.594871	0.818483
-4.4	109.0849	0.73832	13.78278	0.046628	3.429838	0.63149
-4.3	109.3819	0.511862	13.80157	0.032281	3.176344	0.43843
-4.2	109.727	0.709041	13.82329	0.04466	2.8801	0.608101
-4.1	109.4371	0.572588	13.80505	0.03612	3.128886	0.490318
-4	109.4164	0.582012	13.80374	0.03671	3.14664	0.498446
-3.9	110.0171	0.617716	13.84157	0.038867	2.631438	0.530359
-3.8	109.1817	1.01472	13.78882	0.064148	3.346137	0.866998
-3.7	109.3405	1.822965	13.79852	0.115333	3.205606	1.556332
-3.6	109.7547	1.086565	13.82494	0.068461	2.855026	0.931584
-3.5	109.1057	1.382237	13.78389	0.087525	3.409347	1.178988
-3.4	107.3245	1.936272	13.67064	0.123714	4.922015	1.636073
-3.3	108.2703	1.076675	13.73113	0.068234	4.123712	0.917549
-3.2	107.8353	2.219868	13.70297	0.140957	4.486092	1.887979
-3.1	103.8792	2.52012	13.44899	0.163338	7.81164	2.096847
-3	102.8022	4.155234	13.37732	0.272336	8.6816	3.415335
-2.9	103.9138	2.961295	13.45082	0.194181	7.777155	2.432451
-2.8	102.4156	2.986764	13.35347	0.195147	9.020167	2.463218
-2.7	103.396	4.837755	13.41496	0.316095	8.175758	3.989608
-2.6	95.84289	4.820431	12.91519	0.324969	14.31651	3.835471
-2.5	101.4076	5.065954	13.28479	0.335994	9.811917	4.108563
-2.4	96.93372	3.663712	12.99022	0.247121	13.4697	2.913134
-2.3	94.28943	3.794876	12.81151	0.259487	15.56695	2.96783

-2.2	89.05618	4.303419	12.44983	0.300785	19.6055	3.275504
-2.1	88.06883	4.379301	12.38036	0.310133	20.35007	3.275862
-2	85.2727	3.286951	12.18378	0.23472	22.46114	2.430772
-1.9	84.4511	4.031807	12.12374	0.290154	23.04936	2.950231
-1.8	82.8355	4.409194	12.00651	0.315436	24.21799	3.253939
-1.7	80.861	3.770176	11.86344	0.275589	25.6489	2.699045
-1.6	75.09604	4.540385	11.43052	0.348283	29.61376	3.021606
-1.5	70.06985	2.932215	11.044	0.233737	32.94307	1.827516
-1.4	64.51205	4.72617	10.5923	0.387321	36.2836	2.796906
-1.3	64.38086	4.160446	10.58315	0.338797	36.38379	2.494075
-1.2	55.73693	2.947371	9.848784	0.256615	41.13231	1.533419
-1.1	55.10862	3.771433	9.790871	0.330888	41.41388	1.927065
-1	48.59112	4.173728	9.190469	0.39549	44.33914	1.722012
-0.9	52.57479	4.840992	9.558491	0.440662	42.56573	2.25934
-0.8	42.1427	3.180465	8.560801	0.321906	46.73344	1.025609
-0.7	45.33238	4.359737	8.874852	0.428281	45.58545	1.59153
-0.6	39.33962	6.125648	8.251661	0.650194	47.27712	1.580203
-0.5	36.21899	2.039184	7.938767	0.224638	48.32112	0.400368
-0.4	32.71169	5.595155	7.516738	0.685197	48.50712	0.540641
-0.3	36.23972	4.906276	7.925449	0.548032	48.09814	0.885866
-0.2	32.2491	4.328265	7.477508	0.499938	48.76224	0.56528
-0.1	32.93956	3.902257	7.560167	0.457098	48.71968	0.424516
0	30.99951	4.271947	7.329795	0.511051	48.86567	0.356522
0.1	28.67278	5.551051	7.032604	0.692689	48.74747	0.514063
0.2	34.43772	5.45317	7.719368	0.62225	48.34457	0.81925

0.3	38.44209	3.657736	8.173222	0.381208	47.73949	1.03139
0.4	38.68372	4.218163	8.195312	0.45291	47.62867	1.000507
0.5	42.18411	5.049446	8.555541	0.517115	46.58752	1.555701
0.6	41.16232	5.004662	8.451199	0.512325	46.90282	1.545407
0.7	43.64783	4.41956	8.707421	0.440214	46.16965	1.535322
0.8	47.70745	3.020172	9.11031	0.289453	44.75324	1.200622
0.9	59.09229	4.736216	10.13654	0.398995	39.32676	2.653654
1	60.88739	3.06955	10.29402	0.258663	38.41043	1.71672
1.1	64.75367	2.915883	10.61645	0.23978	36.20181	1.714278
1.2	67.18391	4.41628	10.81081	0.354822	34.69675	2.712838
1.3	66.70754	5.313374	10.7696	0.431414	34.94817	3.201375
1.4	73.01792	4.303036	11.27164	0.33043	31.00332	2.858392
1.5	80.63315	4.618766	11.84503	0.34059	25.78738	3.265423
1.6	77.62293	3.546328	11.6236	0.264569	27.92252	2.46384
1.7	81.48231	5.680015	11.90488	0.416903	25.14848	4.043124
1.8	87.95147	3.622296	12.37333	0.255704	20.45588	2.720848
1.9	85.01034	3.562037	12.1646	0.255877	22.6488	2.613108
2	90.09868	4.317947	12.52249	0.302402	18.80959	3.27735
2.1	97.09944	3.155161	13.00192	0.213493	13.34518	2.499217
2.2	96.58851	3.685338	12.96709	0.24581	13.74624	2.968984
2.3	95.40105	4.590365	12.88573	0.310342	14.6725	3.639717
2.4	99.35018	3.0027	13.15203	0.197663	11.53194	2.45581
2.5	102.6089	4.210017	13.36466	0.275778	8.840601	3.462236
2.6	100.6965	2.952819	13.2409	0.194734	10.43449	2.409879
2.7	105.1842	2.221799	13.53345	0.14251	6.724188	1.869616

2.8	108.3324	3.644558	13.73328	0.233345	4.045638	3.072783
2.9	107.9527	2.233236	13.71042	0.14195	4.386163	1.897301
3	107.8216	2.876741	13.70159	0.183783	4.490731	2.431112
3.1	108.7812	1.569537	13.76331	0.099112	3.685469	1.342578
3.2	109.3888	1.161592	13.80185	0.073257	3.16828	0.994953
3.3	109.2368	1.770634	13.792	0.111818	3.294718	1.514527
3.4	110.307	0.653919	13.85979	0.041101	2.382169	0.562059
3.5	109.0367	1.250533	13.77958	0.079406	3.469017	1.063555
3.6	110.0308	1.152416	13.8423	0.07228	2.617762	0.992679
3.7	110.3208	1.168726	13.86052	0.073451	2.368462	1.004656
3.8	110.3346	0.991748	13.86145	0.062149	2.357359	0.855029
3.9	110.1551	0.73784	13.85023	0.046389	2.512532	0.633994
4	110.9145	0.666453	13.8979	0.041696	1.859016	0.575534
4.1	110.3484	0.556893	13.86241	0.034999	2.346808	0.478706
4.2	110.7075	0.705742	13.88491	0.044231	2.037382	0.608385
4.3	110.9284	0.492673	13.8988	0.030833	1.847463	0.425328
4.4	110.6108	0.657134	13.87886	0.041269	2.12076	0.56529
4.5	110.8386	0.477944	13.89318	0.029914	1.924877	0.412571
4.6	110.1828	0.659298	13.85198	0.04143	2.488981	0.566807
4.7	111.1424	0.572054	13.91219	0.035765	1.662663	0.49436
4.8	110.1896	0.727105	13.8524	0.045734	2.482904	0.624492
4.9	110.6937	0.677066	13.88406	0.042464	2.04933	0.583247
5	110.9145	0.504405	13.89793	0.031587	1.859365	0.435185
5.1	111.6257	0.384843	13.94243	0.024018	1.245326	0.333178
5.2	111.46	0.605878	13.93205	0.037862	1.388158	0.523848

5.3	111.1907	0.79438	13.91517	0.049741	1.620311	0.685429
5.4	111.9088	0.854035	13.96002	0.053291	0.999087	0.739509
5.5	110.9284	0.707627	13.89876	0.044257	1.846959	0.611296
5.6	110.666	0.782863	13.8823	0.049111	2.072829	0.674213
5.7	110.7626	0.569677	13.8884	0.03571	1.990189	0.490994
5.8	111.4185	0.488477	13.92947	0.030502	1.424293	0.422669
5.9	111.0527	0.387885	13.90659	0.024299	1.740426	0.334524
6	111.9571	0.582396	13.96309	0.036318	0.957986	0.504621
6.1	111.8673	0.645741	13.95747	0.040247	1.035652	0.559802
6.2	112.2884	0.517554	13.98374	0.032278	0.670855	0.448385
6.3	111.6464	0.7228	13.94367	0.045124	1.226706	0.625554
6.4	112.0468	0.61551	13.96867	0.038316	0.880217	0.534245
6.5	111.7569	0.572193	13.95059	0.035713	1.131445	0.495333
6.6	112.4749	0.462849	13.99535	0.028816	0.509075	0.401696
6.7	111.8398	0.327595	13.9558	0.020468	1.060116	0.283295
6.8	112.0884	0.336019	13.9713	0.020919	0.8447	0.291627
6.9	112.2333	0.662794	13.98028	0.041232	0.718392	0.575676
7	113.0618	0.656954	14.03179	0.040737	-0.00164	0.572447

340 RPM - 36.8cm						
Avg y position	Avg model pressure	STD Pressure	Avg U∞	STD U∞	Avg U∞(U∞max-U∞)	STD U∞(U∞max-U∞)
-7	99.57108	0.290781	13.1681	0.019212	0.754999	0.252295
-6.9	99.35706	0.072423	13.15395	0.004793	0.940608	0.062728
-6.8	99.66093	0.077658	13.17405	0.005134	0.677255	0.067341
-6.7	99.26728	0.40076	13.14798	0.026577	1.017997	0.346421
-6.6	99.23285	0.397449	13.1457	0.02632	1.047809	0.344053
-6.5	99.39855	0.397498	13.15667	0.026303	0.904344	0.344363
-6.4	99.52969	0.340228	13.16536	0.022482	0.790808	0.295154
-6.3	99.17761	0.557918	13.14202	0.036955	1.095276	0.482852
-6.2	99.7368	0.411919	13.17904	0.027215	0.61108	0.357414
-6.1	99.06024	0.21677	13.13428	0.014374	1.197364	0.18739
-6	99.5711	0.212289	13.16811	0.014051	0.755062	0.183865
-5.9	100.082	0.904298	13.20172	0.059575	0.309883	0.786903
-5.8	99.61256	0.444082	13.17082	0.029358	0.718783	0.385077
-5.7	99.85419	0.466537	13.18679	0.030837	0.509094	0.404628
-5.6	99.28799	0.573398	13.14933	0.037958	0.999707	0.496541
-5.5	99.59876	0.694706	13.16986	0.045911	0.730133	0.602608
-5.4	99.52284	0.667875	13.16485	0.044246	0.796025	0.577901
-5.3	99.33635	0.514375	13.15254	0.034068	0.957973	0.445207
-5.2	98.87374	0.656419	13.12185	0.043598	1.357712	0.566528
-5.1	99.76446	0.69456	13.18082	0.045945	0.5864	0.601913
-5	99.24663	0.609121	13.14658	0.04034	1.035418	0.527252
-4.9	98.83933	0.246716	13.11963	0.016393	1.38825	0.212845
-4.8	98.01077	2.899093	13.06308	0.195786	2.083272	2.459467
-4.7	98.74262	1.022553	13.1130	0.06795	1.469582	0.882051

			4	1		
-4.6	98.82547	1.048312	13.11854	0.06966	1.397928	0.904315
-4.5	97.3549	1.500341	13.02036	0.100854	2.660453	1.278985
-4.4	97.87268	0.915962	13.05518	0.061081	2.219327	0.787286
-4.3	97.65179	1.475931	13.04021	0.098735	2.406026	1.264484
-4.2	94.48279	1.949617	12.82657	0.132434	5.09911	1.64374
-4.1	97.49302	1.79273	13.02943	0.119704	2.539952	1.538866
-4	97.00967	2.436773	12.99662	0.163266	2.947746	2.084342
-3.9	97.71396	2.17316	13.04394	0.144819	2.34702	1.869225
-3.8	94.8142	2.864057	12.84825	0.195184	4.808788	2.406344
-3.7	94.02715	3.606416	12.79393	0.246124	5.460996	3.02549
-3.6	94.97294	3.126241	12.8587	0.214836	4.670457	2.603252
-3.5	94.81417	3.311834	12.84778	0.224389	4.802565	2.799971
-3.4	93.32984	2.223682	12.74785	0.15149	6.065845	1.868982
-3.3	92.3839	1.909301	12.6833	0.130659	6.859501	1.596983
-3.2	92.33564	1.427886	12.68028	0.097882	6.903592	1.192126
-3.1	92.25964	1.758742	12.67486	0.120819	6.964316	1.464909
-3	90.86504	2.755076	12.57781	0.192262	8.109421	2.255425
-2.9	92.91556	2.975612	12.71881	0.202893	6.403261	2.49879
-2.8	90.01585	2.925349	12.51871	0.20368	8.80657	2.400689
-2.7	89.97441	3.522303	12.5151	0.244669	8.830997	2.89835
-2.6	87.4889	1.868343	12.34266	0.132388	10.8788	1.502847
-2.5	86.97797	3.108111	12.30532	0.220213	11.27469	2.500439
-2.4	86.66042	2.618971	12.28338	0.186393	11.53757	2.095881
-2.3	84.19567	2.770912	12.1072	0.198926	13.49983	2.19473

-2.2	86.71569	3.400349	12.28637	0.240466	11.48083	2.741602
-2.1	83.38787	1.738786	12.04994	0.1258	14.14928	1.364327
-2	83.17383	2.943627	12.03324	0.213587	14.30113	2.301621
-1.9	81.37878	3.675537	11.90151	0.269942	15.68492	2.831043
-1.8	78.15457	4.128955	11.66234	0.306374	18.1367	3.13959
-1.7	80.19122	3.258694	11.81495	0.239506	16.6083	2.507784
-1.6	72.99719	2.13892	11.27364	0.164873	21.97726	1.544487
-1.5	69.15849	4.914755	10.96754	0.389274	24.61387	3.412209
-1.4	71.15375	4.09244	11.12702	0.319299	23.24847	2.904923
-1.3	68.35072	3.154268	10.90718	0.253275	25.22239	2.144898
-1.2	71.14	5.14689	11.12326	0.40297	23.22262	3.636957
-1.1	64.68467	8.283559	10.59177	0.681908	27.43514	5.425408
-1	63.75952	3.341546	10.5337	0.277004	28.27828	2.155927
-0.9	59.03707	5.438981	10.12907	0.463521	31.15086	3.345302
-0.8	59.87248	4.715821	10.20315	0.403735	30.67575	2.873752
-0.7	59.08538	5.335325	10.13358	0.455546	31.12638	3.270815
-0.6	57.54579	4.858849	10.00207	0.417194	32.06827	2.949167
-0.5	48.44615	7.080173	9.162188	0.652453	36.80705	3.718076
-0.4	54.74276	4.910386	9.75346	0.452193	33.66161	2.578687
-0.3	52.91997	4.741963	9.590524	0.426343	34.68102	2.620281
-0.2	56.01995	5.915827	9.863366	0.522813	32.89099	3.395476
-0.1	50.9731	5.4516	9.407709	0.515137	35.6536	2.689057
0	52.93385	5.242064	9.589893	0.467346	34.6485	2.952077
0.1	56.82084	3.491175	9.942794	0.305104	32.54674	2.045914
0.2	48.8397	4.45133	9.212956	0.419119	36.79314	2.213371

0.3	54.43204	5.55798	9.723076	0.505623	33.80088	2.997297
0.4	51.76014	4.720988	9.484372	0.432276	35.2969	2.506834
0.5	54.24565	6.567896	9.701529	0.59208	33.84049	3.618431
0.6	54.47342	6.261392	9.723746	0.561512	33.73766	3.484265
0.7	60.57669	3.898572	10.26553	0.334612	30.27442	2.366802
0.8	67.27369	3.517304	10.82004	0.286411	25.94553	2.338595
0.9	58.60211	6.887509	10.08425	0.604031	31.31556	4.014562
1	66.58328	3.035765	10.76539	0.243347	26.42502	2.068789
1.1	69.46234	2.37357	10.99687	0.187708	24.47268	1.651262
1.2	71.65781	5.360986	11.16319	0.417513	22.84899	3.815744
1.3	68.47501	2.883594	10.91757	0.231791	25.14336	1.956504
1.4	74.50918	3.784124	11.38728	0.29262	20.84715	2.721021
1.5	72.62438	4.725655	11.23994	0.370939	22.1809	3.327881
1.6	75.75884	3.524373	11.4831	0.265059	19.93818	2.63317
1.7	77.62293	3.950671	11.62284	0.296234	18.54012	2.962588
1.8	79.79777	3.436094	11.78562	0.253919	16.90557	2.625781
1.9	83.87117	2.672302	12.08395	0.192462	13.75735	2.108504
2	85.24509	3.683652	12.18127	0.261703	12.65183	2.954431
2.1	84.06448	3.357073	12.09697	0.242946	13.59293	2.633775
2.2	82.18656	2.815042	11.96173	0.205584	15.07463	2.183466
2.3	84.00234	3.733469	12.09197	0.267986	13.63506	2.958077
2.4	87.37157	3.05583	12.3332	0.216492	10.95805	2.458613
2.5	87.83416	2.674461	12.36629	0.187429	10.59004	2.178905
2.6	89.71203	2.41713	12.49806	0.16955	9.062615	1.967019
2.7	88.86975	5.27362	12.43492	0.370656	9.694316	4.28298

2.8	89.51872	2.075692	12.48489	0.145169	9.225066	1.694909
2.9	92.5289	2.92501	12.69232	0.20253	6.726244	2.415369
3	91.25163	2.405719	12.60493	0.165374	7.794754	2.002404
3.1	93.28835	2.992854	12.74427	0.205321	6.090745	2.496686
3.2	94.62089	1.733149	12.83608	0.117297	4.984491	1.466939
3.3	92.31488	3.173781	12.67734	0.219656	6.90092	2.622191
3.4	93.17102	3.372795	12.73576	0.233961	6.182555	2.779717
3.5	92.6118	1.686403	12.69908	0.115423	6.671354	1.410309
3.6	94.62776	1.535443	12.83666	0.104007	4.980184	1.29839
3.7	93.83382	2.141747	12.78229	0.146006	5.643678	1.798928
3.8	93.74402	3.190951	12.77516	0.217527	5.705818	2.680419
3.9	97.11325	2.185119	13.00375	0.146958	2.861665	1.861769
4	96.00864	2.731339	12.92911	0.183806	3.798118	2.325749
4.1	97.51372	2.720023	13.03009	0.182763	2.51261	2.319912
4.2	98.38359	1.959408	13.08871	0.131126	1.772947	1.678071
4.3	97.33419	1.439504	13.01901	0.096083	2.67867	1.236113
4.4	96.87163	1.673256	12.98791	0.112257	3.072868	1.42929
4.5	98.10745	1.465772	13.07061	0.09817	2.014488	1.254271
4.6	99.03944	1.490561	13.13254	0.0991	1.210562	1.285133
4.7	100.013	0.974992	13.19714	0.064402	0.36961	0.846173
4.8	99.6332	1.211188	13.17198	0.079853	0.698151	1.053162
4.9	99.4123	0.649792	13.15754	0.043043	0.891852	0.562322
5	99.03949	1.44597	13.13257	0.095841	1.210835	1.250571
5.1	99.24663	1.183373	13.14641	0.078704	1.033144	1.019907
5.2	99.1707	0.723228	13.14153	0.04779	1.10079	0.627438

5.3	99.14997	0.904423	13.1401	0.059868	1.118078	0.783243
5.4	98.70811	0.549054	13.11088	0.036482	1.501012	0.473668
5.5	99.63322	0.650523	13.17215	0.042982	0.70038	0.56441
5.6	100.1924	0.504015	13.20909	0.033326	0.215123	0.436975
5.7	100.441	0.562749	13.22546	0.037055	-0.00136	0.489932
5.8	99.64015	0.849749	13.17256	0.056031	0.693731	0.738773
5.9	100.3168	0.46957	13.21729	0.030911	0.107014	0.408929
6	99.9785	0.406354	13.195	0.026801	0.40125	0.353192
6.1	99.59881	0.279653	13.16993	0.018504	0.730967	0.242278
6.2	100.0406	0.433349	13.19909	0.028604	0.347271	0.376359
6.3	99.99228	0.178399	13.19593	0.011775	0.389567	0.154949
6.4	99.42618	0.585823	13.15847	0.038735	0.880004	0.507897
6.5	99.68161	0.413755	13.17539	0.027346	0.658958	0.358875
6.6	99.99921	0.184057	13.19639	0.012144	0.383544	0.159919
6.7	99.96472	0.286845	13.1941	0.018897	0.413399	0.249604
6.8	99.95089	0.112069	13.1932	0.007396	0.425562	0.097345
6.9	99.97162	0.408159	13.19455	0.026898	0.407222	0.35505
7	100.227	0.369793	13.21139	0.024381	0.185277	0.32153

140 RPM - 36.8cm						
Avg y position	Avg model pressure	STD Pressure	Avg U∞	STD U∞	Avg U∞(U∞max-U∞)	STD U∞(U∞max-U∞)
-7	14.29155	0.05383	4.988797	0.009395	0.19742	0.046499
-6.9	14.35374	0.020811	4.999648	0.003628	0.143674	0.017999
-6.8	14.35374	0.020811	4.999648	0.003628	0.143674	0.017999
-6.7	14.46418	0.046534	5.018839	0.008067	0.047858	0.040474
-6.6	14.34684	0.051911	4.998439	0.00904	0.149615	0.044944
-6.5	14.25701	0.046646	4.982768	0.008158	0.227245	0.040211
-6.4	14.36065	0.031023	5.000848	0.005402	0.13769	0.026864
-6.3	14.25006	0.034106	4.981556	0.00596	0.233258	0.029426
-6.2	14.32608	0.064036	4.994818	0.011168	0.167551	0.05536
-6.1	14.40206	0.033984	5.008053	0.00591	0.1018	0.029463
-6	14.40206	0.063578	5.008045	0.011053	0.101757	0.05514
-5.9	14.33994	0.054179	4.997236	0.009435	0.155584	0.046907
-5.8	14.41586	0.041621	5.010451	0.007233	0.089818	0.036114
-5.7	14.38135	0.062432	5.004444	0.01086	0.119709	0.054113
-5.6	14.32611	0.063996	4.994822	0.011151	0.16753	0.055372
-5.5	14.38135	0.031789	5.004452	0.005528	0.119753	0.02756
-5.4	14.45727	0.083243	5.017627	0.014441	0.053784	0.072351
-5.3	14.51939	0.098347	5.028387	0.017034	-0.00029	0.085617
-5.2	14.46418	0.071082	5.01883	0.012332	0.047815	0.061775
-5.1	14.17414	0.167287	4.968185	0.029413	0.298241	0.143425
-5	14.34684	0.051911	4.998439	0.00904	0.149615	0.044944
-4.9	14.42967	0.07599	5.012837	0.0132	0.077778	0.065961
-4.8	14.47798	0.031789	5.021237	0.005515	0.035875	0.027627

-4.7	13.89103	0.384837	4.917934	0.068319	0.538584	0.326648
-4.6	14.00149	0.407945	4.937391	0.072603	0.444066	0.34535
-4.5	14.29155	0.198747	4.988686	0.034805	0.19686	0.171102
-4.4	14.29848	0.048637	4.990008	0.008488	0.191444	0.042019
-4.3	14.0429	0.263602	4.944999	0.046684	0.4102	0.22431
-4.2	14.16726	0.317733	4.966748	0.056443	0.302993	0.269511
-4.1	13.8013	0.421496	4.901923	0.075108	0.614334	0.356361
-4	13.60802	0.411013	4.867482	0.074235	0.777749	0.342491
-3.9	13.31112	0.440846	4.813978	0.080565	1.025735	0.36266
-3.8	13.61497	0.374741	4.868834	0.066639	0.772442	0.317525
-3.7	13.67011	0.532979	4.878192	0.096477	0.723468	0.443095
-3.6	13.62187	0.378854	4.870052	0.067839	0.766546	0.318699
-3.5	12.68973	0.822105	4.698441	0.15353	1.526897	0.659864
-3.4	13.06953	0.734368	4.768876	0.134451	1.219681	0.603034
-3.3	13.55282	0.210589	4.858013	0.038025	0.82625	0.175534
-3.2	13.2283	0.659876	4.798161	0.119859	1.090439	0.546493
-3.1	13.44229	0.649518	4.836889	0.117801	0.912519	0.53883
-3	12.04771	1.11468	4.575506	0.214085	2.026788	0.865952
-2.9	12.52406	0.476899	4.669298	0.088871	1.668875	0.383644
-2.8	12.85548	0.365584	4.731049	0.067462	1.402216	0.297465
-2.7	12.42745	0.511793	4.651122	0.095345	1.745709	0.411922
-2.6	12.4136	0.595117	4.648144	0.112668	1.75486	0.469928
-2.5	12.53794	0.630028	4.671269	0.117142	1.654612	0.508228
-2.4	12.38602	0.782742	4.642033	0.146693	1.772168	0.625655
-2.3	12.31697	0.639894	4.629783	0.121624	1.83081	0.50283

-2.2	12.25483	0.549211	4.618488	0.10483	1.882237	0.429403
-2.1	12.27556	0.748558	4.621458	0.140497	1.861067	0.597226
-2	12.41362	0.76687	4.647262	0.144966	1.750384	0.606629
-1.9	12.82785	0.676182	4.72483	0.123878	1.419065	0.554826
-1.8	11.99247	0.905289	4.566707	0.172944	2.078747	0.707477
-1.7	11.72324	0.672598	4.516541	0.128815	2.295348	0.523688
-1.6	10.77035	0.572234	4.329321	0.115145	3.013357	0.417713
-1.5	10.56333	0.780149	4.285939	0.163191	3.155723	0.538371
-1.4	10.74279	0.822875	4.322085	0.16739	3.024962	0.591626
-1.3	9.85219	0.64503	4.139955	0.134786	3.660085	0.445855
-1.2	9.030564	1.119215	3.957971	0.247912	4.175831	0.70383
-1.1	8.374688	1.410191	3.805715	0.318984	4.55241	0.85321
-1	9.734805	0.69872	4.114683	0.149651	3.737432	0.464486
-0.9	10.03162	1.694569	4.164319	0.359752	3.470128	1.145421
-0.8	9.368917	0.789989	4.035617	0.172334	3.977038	0.509621
-0.7	8.851059	0.996273	3.919928	0.22006	4.297138	0.629885
-0.6	7.44958	1.069331	3.593488	0.246184	5.096293	0.627354
-0.5	6.496764	0.930689	3.355254	0.238116	5.557655	0.427605
-0.4	7.822344	1.005128	3.683241	0.237944	4.898448	0.555893
-0.3	7.912122	1.259093	3.700291	0.295598	4.827839	0.709145
-0.2	8.091627	1.120959	3.744721	0.262705	4.73865	0.63449
-0.1	7.27	0.938679	3.550752	0.230471	5.194131	0.477232
0	5.751061	1.369307	3.141108	0.38755	5.779456	0.457333
0.1	8.21589	0.900419	3.776727	0.210792	4.683191	0.508835
0.2	8.333251	1.765018	3.788872	0.397575	4.53988	1.08121

0.3	9.320603	1.09803	4.0218	0.239097	3.991697	0.710725
0.4	8.2504	1.817509	3.767409	0.419701	4.576235	1.061889
0.5	7.021449	0.709033	3.4925	0.174169	5.334056	0.360564
0.6	8.271107	0.47144	3.793686	0.108985	4.67231	0.273315
0.7	9.058198	0.910987	3.966808	0.198325	4.172143	0.590237
0.8	9.755536	0.573107	4.119936	0.123165	3.727744	0.378787
0.9	8.457539	0.819378	3.833387	0.184295	4.547275	0.500582
1	10.03857	2.016161	4.160202	0.419843	3.43732	1.405529
1.1	9.141048	0.772826	3.986423	0.165808	4.126494	0.512726
1.2	9.527716	1.134694	4.066249	0.241562	3.854525	0.763573
1.3	10.16286	1.002103	4.201958	0.205435	3.430841	0.712996
1.4	11.34342	0.627614	4.44289	0.122537	2.586437	0.476895
1.5	11.10185	0.561866	4.395645	0.10895	2.769562	0.430786
1.6	10.92925	0.613713	4.360943	0.123252	2.895649	0.449224
1.7	11.36418	0.838561	4.445618	0.164411	2.56401	0.634474
1.8	11.79226	0.616579	4.530103	0.11862	2.243348	0.47739
1.9	11.34347	0.795468	4.441832	0.156841	2.581029	0.597104
2	11.49534	0.749426	4.471862	0.146153	2.467557	0.570347
2.1	12.10293	1.13258	4.586046	0.213129	1.983629	0.901364
2.2	11.45388	1.234455	4.459775	0.239737	2.478984	0.944928
2.3	12.1651	0.603185	4.601301	0.114936	1.952074	0.472535
2.4	12.71742	0.60637	4.704717	0.112526	1.510244	0.490196
2.5	13.0004	0.644243	4.756587	0.121365	1.278259	0.511723
2.6	12.35836	0.313453	4.638763	0.059338	1.803891	0.247505
2.7	13.28352	0.46565	4.808919	0.084273	1.048375	0.387184

2.8	12.5655	0.415177	4.677219	0.077565	1.636538	0.332992
2.9	13.2282	0.063578	4.799611	0.011533	1.097904	0.052727
3	13.11086	0.41456	4.777688	0.076321	1.191999	0.338181
3.1	13.53892	0.483151	4.854908	0.086309	0.834851	0.407411
3.2	13.00738	0.623885	4.758009	0.115483	1.273259	0.505844
3.3	13.03491	0.471473	4.763657	0.086326	1.253708	0.387006
3.4	13.02116	0.56304	4.76081	0.103201	1.263344	0.46164
3.5	13.02119	0.677926	4.7603	0.124867	1.260739	0.552731
3.6	13.23515	0.679882	4.799302	0.123943	1.084242	0.560886
3.7	13.68394	0.354871	4.881197	0.063329	0.714495	0.299566
3.8	13.44229	0.788072	4.836196	0.143692	0.909035	0.650032
3.9	14.47103	0.199207	5.019916	0.034633	0.041339	0.172765
4	13.60799	0.579204	4.866929	0.104442	0.77501	0.483505
4.1	13.57343	0.725195	4.860069	0.13234	0.800702	0.597589
4.2	14.51249	0.080897	5.027201	0.014019	0.005768	0.070385
4.3	13.78747	0.380097	4.89957	0.067927	0.626584	0.320365
4.4	14.11204	0.309091	4.957081	0.054448	0.350538	0.264486
4.5	14.26392	0.117013	4.983939	0.020458	0.221114	0.100901
4.6	14.42967	0.069369	5.01284	0.012058	0.077792	0.060171
4.7	14.18107	0.279667	4.969246	0.049032	0.29151	0.240481
4.8	14.43657	0.109462	5.014018	0.01901	0.071693	0.095037
4.9	14.38825	0.063578	5.005644	0.01106	0.113725	0.055102
5	14.34679	0.111047	4.998401	0.019316	0.149513	0.096254
5.1	14.45727	0.070743	5.017633	0.012298	0.053813	0.061358
5.2	14.25014	0.116995	4.981531	0.020519	0.233001	0.100564

5.3	14.38133	0.069772	5.004436	0.012158	0.119716	0.060372
5.4	14.24313	0.054278	4.98034	0.009484	0.239205	0.046836
5.5	14.31923	0.033984	4.993632	0.005924	0.173522	0.029392
5.6	14.41586	0.074713	5.01044	0.012985	0.08976	0.064815
5.7	14.39516	0.034684	5.006853	0.006032	0.107784	0.030071
5.8	14.39516	0.034684	5.006853	0.006032	0.107784	0.030071
5.9	14.38135	0.044418	5.004449	0.00773	0.119738	0.03848
6	14.2777	0.06807	4.986373	0.011872	0.209359	0.058845
6.1	14.44347	0.041621	5.015247	0.007227	0.065853	0.036143
6.2	14.40206	0.046014	5.00805	0.007996	0.101786	0.039924
6.3	14.40206	0.033984	5.008053	0.00591	0.1018	0.029463
6.4	14.33304	0.033984	4.996038	0.005924	0.161583	0.029392
6.5	14.36755	0.057622	5.002043	0.010032	0.131677	0.0499
6.6	14.32611	0.055974	4.994825	0.009758	0.167545	0.04841
6.7	14.38135	0.062432	5.004444	0.01086	0.119709	0.054113
6.8	14.24316	0.062538	4.980341	0.010931	0.239169	0.05394
6.9	14.42276	0.037356	5.011651	0.006491	0.083834	0.032417
7	14.33994	0.044418	4.997239	0.007737	0.155599	0.038446

140 RPM - 18cm						
Avg y position	Avg model pressure	STD Pressure	Avg U∞	STD U∞	Avg U∞(U∞max-U∞)	STD U∞(U∞max-U∞)
-7	15.85175	0.046014	5.254061	0.007633	0.167784	0.039782
-6.9	15.81034	0.043873	5.247194	0.00728	0.203603	0.037919
-6.8	15.78273	0.070743	5.242603	0.011753	0.227411	0.061069
-6.7	15.90007	0.044418	5.262063	0.007352	0.12594	0.03849
-6.6	15.85865	0.031789	5.255208	0.005269	0.161825	0.027505
-6.5	15.98994	0.055602	5.276911	0.009177	0.047912	0.048317
-6.4	15.9415	0.037407	5.268917	0.006182	0.090008	0.032465
-6.3	15.92082	0.077331	5.265486	0.012775	0.107889	0.06714
-6.2	15.81724	0.057622	5.248336	0.009562	0.197617	0.049805
-6.1	15.87939	0.069419	5.258632	0.011487	0.143822	0.06017
-6	15.95536	0.048655	5.271203	0.008038	0.077968	0.042242
-5.9	15.86556	0.051911	5.256347	0.008607	0.155826	0.044905
-5.8	15.83795	0.046014	5.251773	0.007633	0.179728	0.039786
-5.7	15.92773	0.062504	5.266632	0.010336	0.10193	0.054214
-5.6	15.78963	0.069715	5.243749	0.011576	0.221453	0.060216
-5.5	15.78963	0.031789	5.243759	0.005281	0.221506	0.027444
-5.4	15.84485	0.055927	5.252915	0.009271	0.173743	0.048391
-5.3	15.83105	0.112069	5.250602	0.018592	0.185555	0.096888
-5.2	15.89316	0.041621	5.260921	0.006889	0.131925	0.036066
-5.1	15.79654	0.067967	5.244896	0.011271	0.215494	0.058784
-5	15.86556	0.051911	5.256347	0.008597	0.155827	0.044958
-4.9	15.88626	0.057622	5.259774	0.009541	0.137884	0.049915
-4.8	15.92082	0.08891	5.265481	0.014699	0.107863	0.077137

-4.7	15.80344	0.048558	5.246048	0.008059	0.209561	0.041964
-4.6	15.83795	0.063578	5.251768	0.010542	0.179701	0.054993
-4.5	15.94158	0.090284	5.268912	0.014922	0.089851	0.078348
-4.4	15.87248	0.072474	5.257488	0.011993	0.149794	0.062815
-4.3	16.03828	0.088116	5.28487	0.014524	0.005799	0.076679
-4.2	15.89316	0.041621	5.260921	0.006889	0.131925	0.036066
-4.1	15.83105	0.054179	5.250627	0.008989	0.185687	0.046834
-4	15.83112	0.228137	5.250511	0.037991	0.184943	0.196474
-3.9	15.98994	0.070851	5.276906	0.011694	0.047886	0.061567
-3.8	16.03138	0.080975	5.283736	0.013326	0.011823	0.070575
-3.7	15.72061	0.069715	5.232276	0.011586	0.281001	0.060162
-3.6	15.693	0.388865	5.227285	0.065564	0.302698	0.330633
-3.5	15.85865	0.069715	5.255198	0.011551	0.161772	0.060349
-3.4	15.84485	0.071082	5.25291	0.011783	0.173716	0.061503
-3.3	15.86563	0.261084	5.256187	0.043659	0.15485	0.223891
-3.2	15.40306	0.432691	5.178661	0.073288	0.550589	0.366128
-3.1	15.62398	0.138911	5.216132	0.02316	0.363942	0.119484
-3	15.20976	0.710338	5.145147	0.121742	0.710072	0.59356
-2.9	14.95428	0.677924	5.101871	0.115533	0.926222	0.569985
-2.8	14.30535	0.700639	4.989755	0.121325	1.463651	0.578914
-2.7	14.72643	0.267031	5.06393	0.046438	1.122447	0.219557
-2.6	13.58733	0.998705	4.861057	0.179625	2.03376	0.790069
-2.5	13.64943	1.23232	4.870314	0.22473	1.974555	0.958837
-2.4	13.62177	1.25748	4.865213	0.228058	1.995759	0.98508
-2.3	14.18112	0.891932	4.967044	0.156793	1.55996	0.724706

-2.2	13.35254	1.286651	4.816304	0.238148	2.206083	0.98326
-2.1	12.49645	0.872231	4.66215	0.163448	2.882065	0.655156
-2	12.04771	1.006152	4.576254	0.197284	3.209477	0.710038
-1.9	12.28243	1.150871	4.619891	0.215549	3.031384	0.865789
-1.8	11.48154	1.156979	4.465508	0.23333	3.610044	0.78442
-1.7	12.26178	0.931041	4.617538	0.179105	3.05492	0.675399
-1.6	10.47356	0.879416	4.266976	0.180389	4.315965	0.578469
-1.5	10.58401	0.811026	4.289988	0.167139	4.24525	0.529717
-1.4	8.93391	0.77718	3.94073	0.170278	5.272666	0.453854
-1.3	9.002981	1.019426	3.953587	0.21903	5.220341	0.618168
-1.2	7.974266	0.966112	3.71987	0.223485	5.776378	0.503489
-1.1	7.235465	0.862064	3.543361	0.212904	6.129946	0.378239
-1	7.152689	0.71115	3.525011	0.175331	6.177095	0.313431
-0.9	7.725715	0.554659	3.665607	0.132434	5.922385	0.266173
-0.8	6.365598	0.806687	3.323126	0.206654	6.48062	0.314959
-0.7	6.407036	1.051815	3.328806	0.278273	6.43848	0.368933
-0.6	5.578532	0.754936	3.11002	0.20738	6.724785	0.219677
-0.5	5.219498	0.569008	3.010548	0.162536	6.824223	0.136178
-0.4	4.591255	0.833366	2.815923	0.258339	6.889493	0.108509
-0.3	4.901925	0.957934	2.908933	0.274552	6.840122	0.226775
-0.2	4.390994	1.069696	2.744635	0.338929	6.861413	0.13865
-0.1	3.327818	0.80787	2.389344	0.295257	6.834818	0.169695
0	3.831798	1.066936	2.557633	0.364379	6.846734	0.149407
0.1	4.411676	0.507476	2.76726	0.15903	6.944989	0.057194
0.2	5.530218	0.814254	3.094738	0.231937	6.728145	0.198982
0.3	5.323054	0.732024	3.03728	0.21269	6.78522	0.162887

			6	7		
0.4	6.766071	0.906854	3.424281	0.240266	6.31792	0.312915
0.5	6.089389	0.983656	3.246188	0.259561	6.554936	0.347894
0.6	6.835092	0.724446	3.445269	0.18305	6.308664	0.294885
0.7	6.56581	0.486144	3.379099	0.126321	6.427832	0.179094
0.8	7.594574	0.701432	3.632945	0.166275	5.97811	0.343533
0.9	7.794736	1.044764	3.676106	0.247162	5.857686	0.515589
1	7.66362	1.043165	3.644341	0.255605	5.918108	0.470638
1.1	8.975347	0.538379	3.951711	0.11977	5.258548	0.304854
1.2	8.782038	0.941129	3.905205	0.208306	5.349356	0.538843
1.3	10.72903	0.699552	4.320295	0.139448	4.152907	0.48123
1.4	9.865995	0.634793	4.142912	0.133089	4.718206	0.402235
1.5	10.7152	1.501047	4.30938	0.300444	4.119291	1.026521
1.6	10.71518	0.716947	4.31733	0.144715	4.161362	0.484086
1.7	11.90957	1.20235	4.5483	0.231445	3.302281	0.87109
1.8	11.33657	1.242746	4.43689	0.238282	3.711227	0.905387
1.9	12.6552	0.431152	4.693845	0.080162	2.773152	0.327117
2	14.14651	0.820678	4.961308	0.145705	1.589911	0.659066
2.1	14.11895	0.512958	4.957784	0.089773	1.619276	0.4188
2.2	13.43539	1.169855	4.83251	0.210954	2.147468	0.923161
2.3	12.97972	0.627551	4.752959	0.114912	2.520481	0.485593
2.4	13.55282	1.257479	4.852914	0.226844	2.050815	0.991406
2.5	14.29843	1.108678	4.986156	0.196966	1.456693	0.889875
2.6	14.92669	1.093567	5.095054	0.187187	0.938224	0.915096
2.7	13.91176	0.636113	4.920791	0.112875	1.784537	0.511227

2.8	15.58252	0.331401	5.208962	0.055766	0.398244	0.282348
2.9	15.83117	0.246435	5.250496	0.041002	0.184781	0.21242
3	15.60325	0.44103	5.212197	0.074307	0.379243	0.375259
3.1	15.74822	0.220349	5.236753	0.036814	0.256587	0.18913
3.2	15.78273	0.083243	5.242598	0.01383	0.227385	0.071859
3.3	15.78281	0.312184	5.242375	0.05175	0.226079	0.27011
3.4	16.01065	0.065538	5.280324	0.010797	0.029891	0.057057
3.5	15.77583	0.278003	5.241264	0.046652	0.232353	0.237533
3.6	16.03831	0.062504	5.284884	0.010296	0.005829	0.054423
3.7	15.73442	0.109462	5.234554	0.018227	0.269003	0.094275
3.8	16.04519	0.088918	5.286006	0.014634	-0.00021	0.077492
3.9	15.85175	0.033984	5.254064	0.005633	0.167797	0.029404
4	15.79651	0.251722	5.244736	0.042229	0.214689	0.21514
4.1	15.78963	0.044418	5.243757	0.007374	0.221492	0.038374
4.2	15.90699	0.055545	5.263206	0.009187	0.11992	0.048169
4.3	15.88626	0.048558	5.259777	0.008039	0.137897	0.042066
4.4	15.94155	0.078883	5.268912	0.013033	0.089899	0.068479
4.5	15.86556	0.074713	5.25634	0.012385	0.155787	0.064645
4.6	15.77583	0.034684	5.241466	0.005762	0.233423	0.029944
4.7	15.73442	0.057622	5.234577	0.009593	0.269123	0.049641
4.8	15.76202	0.098347	5.23915	0.016348	0.245221	0.084852
4.9	15.78963	0.062432	5.243752	0.010361	0.221466	0.053957
5	15.91395	0.077658	5.264348	0.012841	0.113853	0.067358
5.1	15.90012	0.098407	5.262051	0.016297	0.125792	0.085225
5.2	15.83795	0.055495	5.251771	0.009198	0.179715	0.04802

5.3	15.693	0.076306	5.227677	0.012705	0.304769	0.065724
5.4	15.92773	0.062504	5.266632	0.010336	0.10193	0.054214
5.5	15.89321	0.080975	5.260917	0.013396	0.131816	0.070204
5.6	15.86556	0.060474	5.256345	0.010023	0.155813	0.052334
5.7	15.81724	0.037356	5.248341	0.006197	0.197644	0.032295
5.8	15.87246	0.065443	5.257486	0.010844	0.149828	0.056643
5.9	15.81724	0.037356	5.248341	0.006197	0.197644	0.032295
6	15.85178	0.099121	5.254046	0.016429	0.167657	0.085769
6.1	15.81724	0.037356	5.248341	0.006197	0.197644	0.032295
6.2	15.86556	0.067967	5.256342	0.011262	0.1558	0.058833
6.3	15.88629	0.065493	5.259776	0.010836	0.137849	0.056773
6.4	15.90014	0.10321	5.262053	0.017088	0.125757	0.08941
6.5	15.87939	0.076036	5.25863	0.01259	0.143808	0.065862
6.6	15.92773	0.054262	5.266635	0.008967	0.101943	0.047097
6.7	15.96919	0.044527	5.273488	0.007354	0.065963	0.038669
6.8	15.78963	0.044418	5.243757	0.007374	0.221492	0.038374
6.9	15.78273	0.055495	5.242608	0.00922	0.227438	0.047907
7	15.83795	0.055495	5.251771	0.009208	0.179715	0.04797