AE 460 Laboratory Note for Experiment 5

Turbojet Laboratory

by

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1 INTRODUCTION

This lab served as introduction to turbojet measurement methods and data acquisition. The goal of this lab was to learn basic concepts used to evaluate turbojet engine performance as well as the Brayton thermodynamic cycle in order to investigate flow properties inside a turbojet at four different throttle settings (RPM). Multiple temperature and pressure readings were taken from sensors within the turbojet for IDLE, 56000, 70000, and full throttle RPMs. Holding these throttle positions for a short time allowed us to collect average property values at the inlet, compressor, burner, and nozzle positions within the turbojet. Additional sensors also provided data for fuel flow and thrust. With the average flow property data, enthalpies, static pressures, relative pressures, and isentropic enthalpy for the compressor could be calculated. By further assuming that the compressor and turbine processes are isentropic, compressor efficiency and thermal efficiency were calculated. The SFC at each throttle position could be calculated from the fuel flow and thrust averages. Finally, the thrust readings were compared to the analytical thrust calculations using exit conditions.

2 APPARATUS

The experiment was conducted using an air compressor, a MiniLab gas turbine power system, and a laptop with the National Instruments LabVIEW program installed on it.

2.1 Apparatus Diagram

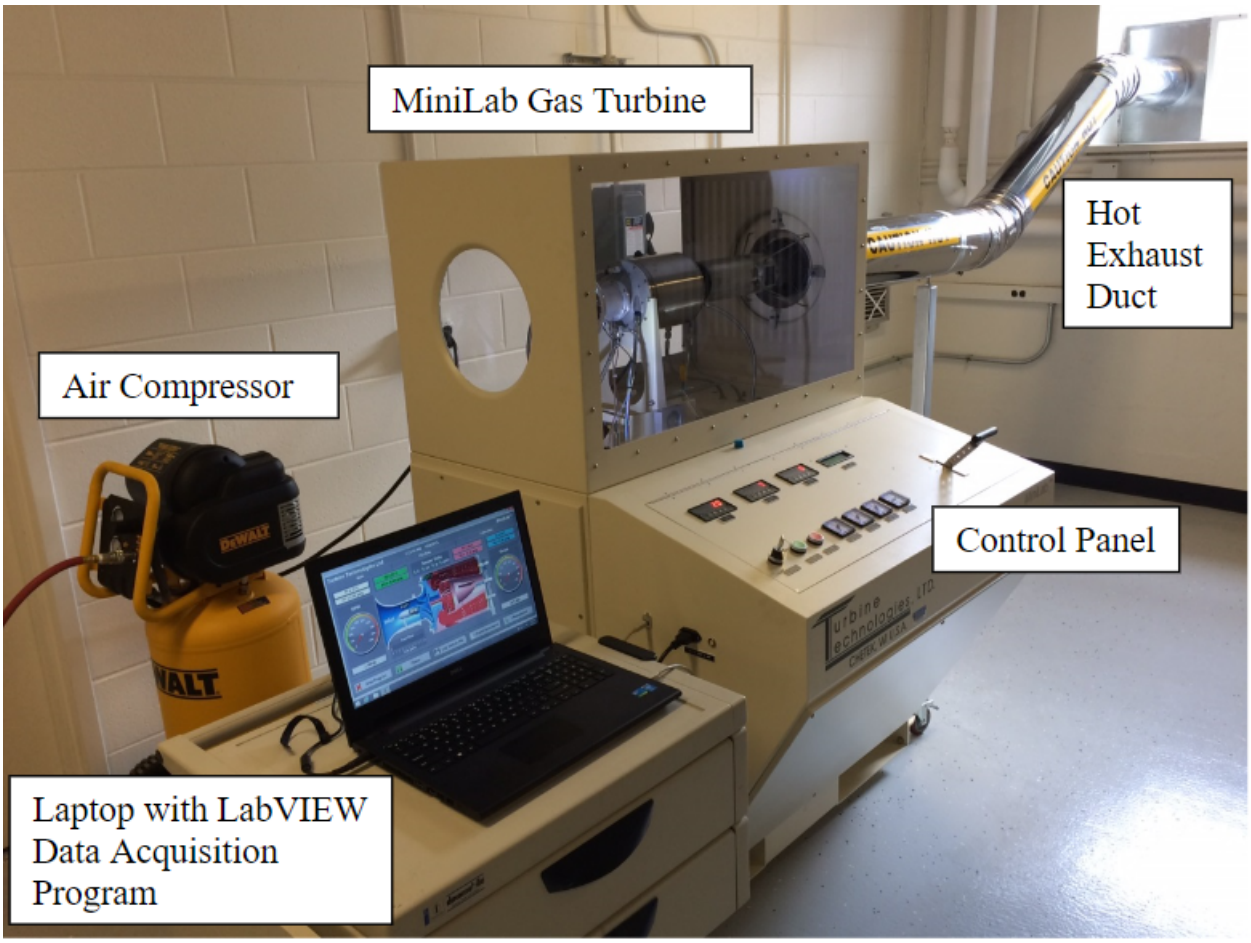

Figure 1: Turbine Technologies MiniLab Gas Turbine Power System

2.2 Air Compressor

Since a SR-30 turbojet was utilized during this lab, the air compressor was necessary to start the turbojet. Using compressed air that was delivered tangentially, the MiniLab caused the compressor to rotate. Once a stable value for the RPM was achieved, the fuel was introduced and thereby

the engine was started. The DeWalt D55168 compressor allowed for sufficient pressure (i.e. a minimum of 120 psi) and flow rate through the compressed air tank. It is vital to note that during this process, the air being supplied had to be free of moisture and particulates to allow the engine to remain undamaged.

2.3 MiniLab Gas Turbine Power System

The MiniLab Gas Turbine Power System contains is a completely self contained system consisting of the SR-30 turbojet engine, performance monitoring sensors, and controls to operate the engine. The SR-30 turbojet uses a centrifugal compressor, annular combustor, and axial flow turbine. While the SR-30 can use multiple different fuels, standard Jet A fuel (density of 0.81 kg/liter and energy content of 43.28 MJ/kg) has been used for this lab. The SR-30 engine behaves similar to large-scale turbojets, with ambient air first passing through the inlet, compressed within the compressor, mixed and ignited in the burner, decelerated through the turbine, and then accelerated through the nozzle to produce thrust. The pressure sensors used to analyze performance are a combination of Setra Systems Model 265 or 209 pressure transducers with an accuracy of ±0.25% and 1.0 F.S respectively. The K type thermocouples used have an uncertainty of the greater of ±2°C or 0.75%.[2]. The load cell is a Futek model FSH00873 with an uncertainty of ±0.3%.

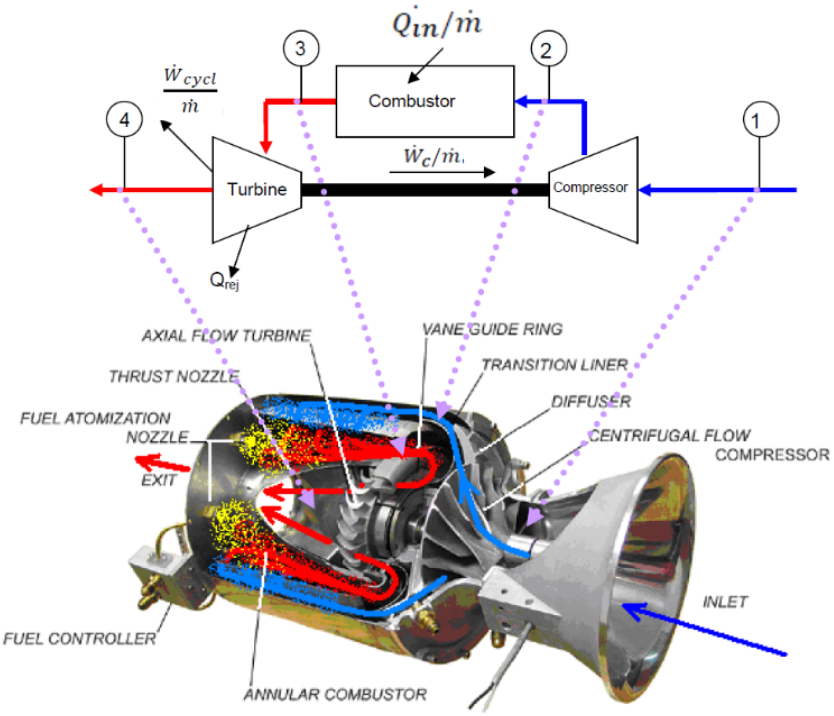

Figure 2: SR-30 turbojet and schematic of the Brayton cycle

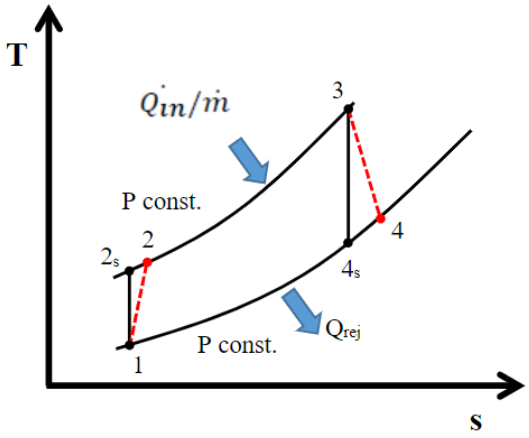

Figure 3: Temperature entropy diagram of the Brayton cycle

2.4 National Instruments LabVIEW Program

Using sensors attached to the SR-30 turbojet engine, data was collected and digitized by a 22-bit National Instruments 6218 USB DAQ Mddule. The module allowed for interfacing with

the computer through the USB port. The LabVIEW program provided a display of all the sensor information and allowed for measurements to be calibrated and recorded to a data file.

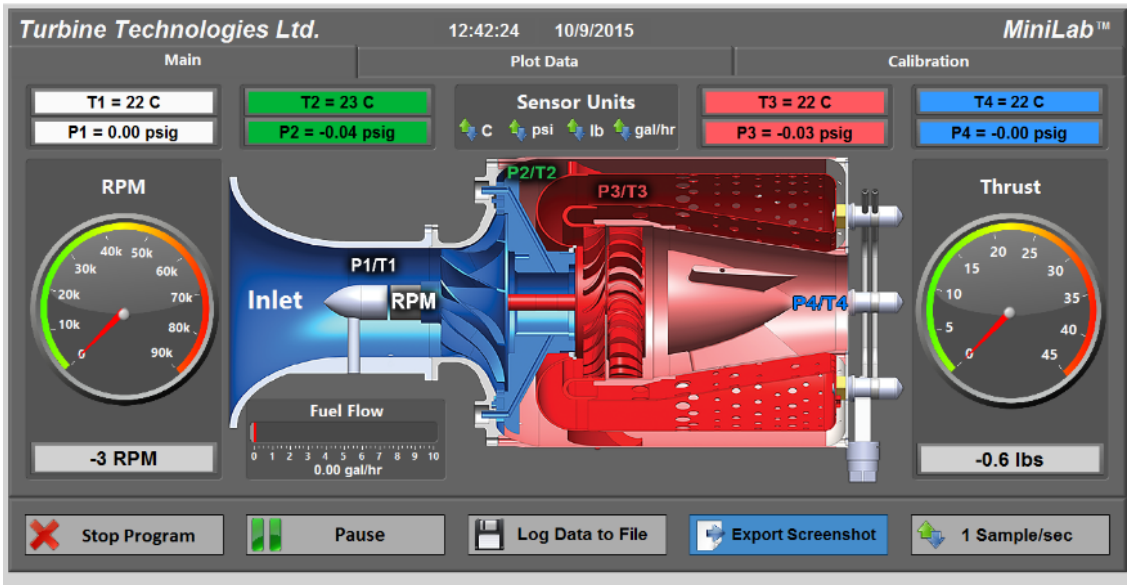

Figure 4: MiniLab LabVIEW program for data acquisition and sensor locations

2.5 Instrumentation Tolerance Matrix

Component Identification	Measurement Uncertainty	Size/Range	Use
Dewalt D55168 compressor	N/A	120 PSI minimum 15 gallons	Provide compressed air to start the turbojet
SR-30 Turbojet Engine	N/A	N/A	Provide thrust and serve as the component to investigate flow properties
Setra Systems Model 265 pressure transducer	+/- 0.25%	N/A	Measure pressure inside the turbojet
Setra Systems Model 209 pressure transducer	1.0% F.S	N/A	Measure pressure inside the turbojet
Futek Model FSH00873	+/- 0.3%	N/A	Load cell to measure thrust
K Type thermocouples	Greater of +/- 2°C or 0.75%	N/A	Measure temperature inside the turbojet

Figure 5: Tolerance Matrix

3 RESULTS AND DISCUSSION

3.1 Start Up and Experimental Observations

The reason that the compressor runs before ignition is to ensure that there is compressed air flowing through the entire jet prior to ignition. If the air is not compressed, ignition may not be possible thus leading to a failure starting the engine. Now we can address the smokey start up of the engine. The compressor running before ignition resolves this issue by ensuring that the air is sufficiently compressed to support ignition. At the start of the ignition process, to ensure that there is enough fuel in the system, the jet creates a fuel rich ignition environment. This fuel rich environment then leads to the soot being ejected from the engine once it is ignited. In addition to this, any build up in the engine from a previous run will be ignited at the start thus leading to a more smokey exhaust. An additional observation is as the engine ignited there was a visible flame expelled out the exhaust which corresponded to the fuel igniting. This may happen due to the excess fuel being present at the start thus leading to a more visible flame. Other than this, the engine ran smoothly throughout the experiment and did not expel excess smoke or flames at any other time.

3.2 Jet RPM v.s. Time

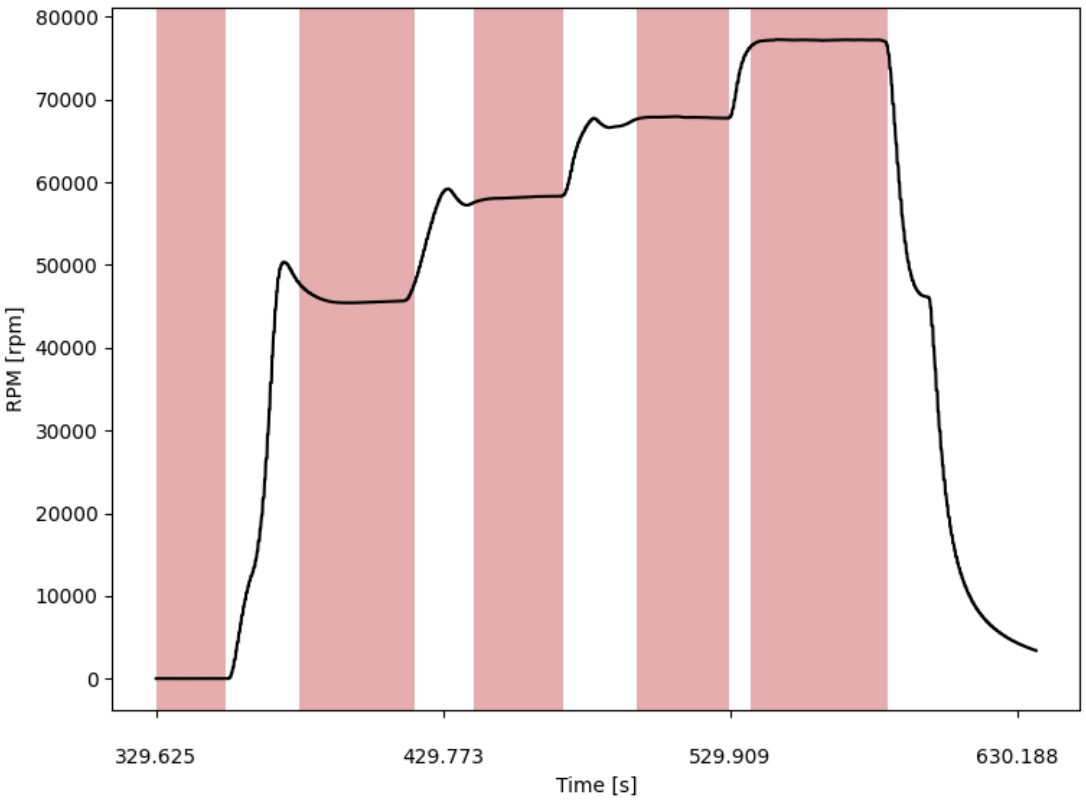

Figure 6: RPM vs Time [s]

In Figure 6 the RPM of the engine vs the time is plotted. It can be observed that there are clear areas of steady operation as highlighted by the shaded areas. The first shaded area corresponds to the pre-start conditions, the second to steady operations at 48,000 rpm, the third to steady operations at 58,000 rpm, the fourth to steady operations at 68,000, and the last shaded area corresponds to running the engine at its highest throttle position. An interesting observation that can be noted is the way the engine settles into the steady operation. For each step, the rpm values initially overshoot to just over the desired value before settling down and reaching the desired value. Additionally, within each regime of steady operation, it can be noted that the rpm is not perfectly constant. There are some small deviations from the desired value due to the engine being non-ideal. To account for the non-perfect engine, any rpm values within ±1000 rpm were counted to be

within the steady operation regime which is why the graph portions highlighted are not perfectly straight. An interesting observation here concerns the idle rpm of the jet. As seen from the second red band, it can be noted that the idle rpm is around 48000. It can be seen that once the jet is started, there is a rapid increase in its rpm with the rpm overshooting the idle value before settling back down. This overshoot may happen so that the jet can ensure that it is fired up and not leaking fuel that has not been ignited before throttling down.

3.3 Average Property Values

The following section outlines the steps taken to find the average property values of each of the following constant RPM areas highlighted by 6. The first step was to find the range of measurements that needed to be averaged by finding the indexes of any rpm number that were ±1000 rpm of the desired value. After these were found the corresponding properties at each of these indexes were then averaged as well. In addition to the average property values during constant rpm states, the pre-start values are tabulated in Table 1. The values for the steady rpm operations are tabulated in Table 2. A sample calculation of how the values were averaged is provided in Appendix A.1.

Table 1: Average Property Values Pre-Start

RPM [rpm]	3.417
T1 [K]	23.719
T2 [K]	23.550
T3 [K]	23.317
T4 [K]	23.808
P1 [kPa]	0.016
P2 [kPa]	-0.0004
P3 [kPa]	0.084
P4 [kPa]	0.024
Fuel Flow [L/hr]	0.009
Thrust [N]	0.608

Table 2: Average Property Values during "Constant" RPM

Target RPM	Average RPM	T1 [C]	T2 [C]	T3 [C]	T4 [C]
48000	47539.318	23.362	54.174	516.009	203.201
58000	58126.225	23.579	106.234	638.579	310.804
68000	67620.010	23.438	140.592	710.483	332.902
Max	77186.17837	23.193	178.694	791.509	349.963
	P1 [kPa]	**P2 [kPa]**	**P3 [kPa]**	**P4 [kPa]**	
48000	1.548	54.241	53.816	5.1805	
58000	2.585	91.808	91.017	10.319	
68000	3.901	136.726	135.498	16.797	
Max	5.833	195.065	192.722	25.872	
	Fuel Flow [L/hr]	**Thrust [N]**			
48000	12.228	22.936			
58000	14.4946	39.820			
68000	16.856	54.098			
Max	22.999	81.315			

There are some interesting patterns that can be noted from both Tables 1 and 2. Firstly, in Table 1, it would be expected that all values except temperature to be about 0 as the system was tared. It appears to have worked for all values except the Thrust as they hover at or around 0. As the thrust value is not tared, this must be noted down for future calculations as other thrust values may need to be adjusted to accommodate the non-zero starting value. The other values not being zero can be put down to floating point error/the sensors measuring the ambient conditions.

Looking at Table 2, there are some interesting observations. Firstly, the values at the first pressure and temperature sensors appear to hold steady for all steady rpm's. This is expected since the jet will not effect conditions outside it besides the small increase in pressure as it sucks more air in. The big changes occur at the sensor locations which are inside and at the exit of the jet. As seen, all the temperature and pressure values at locations 2, 3, and 4 increase as the rpm increase. This is expected as the pressures and temperatures will increase as the jet's rpm increases. An interesting note here is the Fuel Flow increases. For the increases from 48,000 -> 68,000 the fuel flow increases by roughly the same amount at each step. However going from 68,000 -> max rpm (roughly 77,000) there is a much greater in crease in fuel flow for a similar increase in rpm. This indicates that the efficiency of the jet decreases as the rpm increases. Saying that the thrust

produced does increase at a greater rate at the higher rpm's indicates that a trade off between fuel efficiency and thrust is needed to be made.

3.4 Enthalpies, Static and Relative Pressure's, Compressor Isentropic Enthalpy

To find the enthalpy, the following process was used. Firstly, the temperature as the desired position was noted from Table 2 and converted into Kelvins by adding 273.15 to the value. As enthalpy and temperature are directly related, a lookup table can be used to find the enthalpy that corresponds to a given temperature. In this case the look up table that was used was table A22 [3]. Using the table, the desired temperature was compared to those listed on the table and the corresponding enthalpy noted. If the desired temperature was not listed on the table, linear interpolation between the two closest listed temperature values was utilized to find the enthalpy using the following equation:

$$y = y_1 + (x - x_1)\frac{(y_2 - y_1)}{(x_2 - x_1)} \tag{1}$$

An example of this can be found in Appendix A.2. Once the values for h1-h4 were found, the next property that needed to be calculated was the static pressure P1-P4. These static pressures correspond to the placement of the pressure probes within the jet.

To find the static pressure P1 the following equation was used[5]:

$$P1 = P_{amb} - P_{1,vac} \tag{2}$$

P_{amb} is the ambient pressure in the room and $P_{1,vac}$ is the average pressure measured by the pressure probe at position 1 which can be found in Table 2. A sample calculation is available in Appendix A.3. To find the static pressures P2 and P3, which are measured within the turbine, the following equation was used:

$$P_{abs} = P_{gauge} + P_{amb} \tag{3}$$

Again, here P_{amb} is the ambient pressure while P_{guage} is the pressure measured by the sensor. A sample calculation is provided in Appendix A.4. Finally, the static pressure at the 4th position

could be calculated. Since the jet is subsonic, to achieve the static pressure at (4), it was assumed that it was equal to the ambient pressure, or that $P4 = P_{amb}$ [5]. Thus for all RPM's, the static pressure at position 4 was:

$$P4 = 97.6 \text{ kPa} \tag{4}$$

Now that the static pressures are known, the relative pressure was calculated. These are needed in order to find the isentropic enthalpy for the compressor, h_{2s}. To find p_{r1} the first step is to find the temperature that corresponds to the p_{r1} that you want to find from Table 2. After this the temperature will be compared against table A22 [3] and the corresponding p_r value will be found using. It can be interpolated as done above if needed. Once p_{r1} is found the value for p_{r2} can be found using the following equation where P1 and P2 are the static pressures found earlier:

$$p_{r2} = \frac{P2}{P1} * p_{r1} \tag{5}$$

A sample calculation is provided in Appendix A.5. Now that the value of p_{r2} is known it is possible for find h_{2s}. This is done by using table A22 [3] once again. The p_r value closest to the calculated p_{r2} is found and then the value for h_{2s} is then interpolated from those values. The results of the above calculations are tabulated in Table 3.

It has already been previously mentioned how it is palpable to observe the standard increase in the pressure values (outside of P_1 due to the idle rpm and P_4 due to the max rpm). The most important trends in this table are the increases in h_2, h_3, and h_4 as the RPM increased. This same trend also occurred with h_{2s}. One important point to note is that the first value of h_2 was less than the first value of h_{2s}, which should not be the case. This was attributed to some error that occurred when performing the lab and not maintaining the throttle at an RPM value for long enough. As the RPM's increase, the heat absorbed continues to increase in this process, which yields this increasing trend in the enthalpy values as demonstrated in the table.

Table 3: Calculated Properties

Target RPM	h1 [kJ/kg]	h2 [kJ/kg]	h3 [kJ/kg]	h4 [kJ/kg]
48000	296.688	327.648	810.068	478.749
58000	296.906	380.148	946.096	590.184
68000	296.764	414.914	1027.389	613.381
Max	296.518	453.685	1119.275	620.817
	P1 [kPa]	**P2 [kPa]**	**P3 [kPa]**	**P4 [kPa]**
48000	96.0520	151.841	151.416	97.6
58000	95.0149	189.408	188.617	97.6
68000	93.699	234.326	233.098	97.6
Max	91.767	292.665	290.322	97.6
	p_{r1}	p_{r2}	h_{2s}	
48000	1.330	2.103	338.283	
58000	1.334	2.659	361.857	
68000	1.331	3.331	385.909	
Max	1.328	4.235	413.386	

3.5 Isentropic Compressor Efficiency

In this section the isentropic compressor efficiency at each steady operation state is calculated. As a caveat there are some assumptions that are needed to be noted before any calculations can be done. Fistly it is assumed that the compressor and turbine processes are isentropic i.e. ideal Brayton cycle. Secondly it is assumed that the pressure is constant through the combustor and after exiting the turbine stage To find the isentropic compressor efficiency the following equation is used:

$$\eta_c = \frac{h_{2s} - h_1}{h_2 - h_1} \tag{6}$$

The values for h_{2s}, h_1, and h_2 can be found from Table 3. A sample calculation is provided in Appendix A.6. These calculations are preformed for each desired steady operation rpm and are graphed in Figure 7

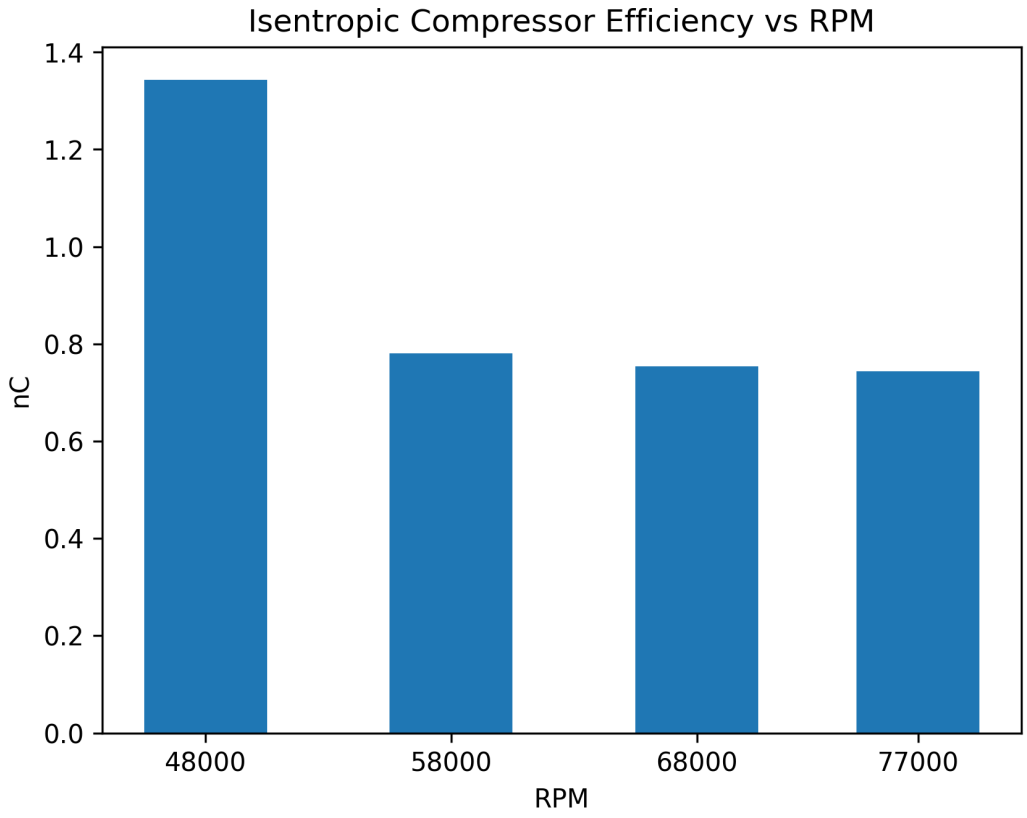

Figure 7: Compressor Efficiency (η_c) vs RPM

From Figure 7 it can be seen that the isentropic compressor efficiency for 48000 rpm is over 1. This is not physically possible. This unexpected value most likely rises from some temperature measurement issues as the value for h_{2s} is much higher than expected and is derived from the measurement of T1. Besides this oddity, it can be seen that the isentropic compressor efficiency for all steady state operations are relatively the same. This makes sense as an increase in the rpm will not drastically change the enthalpy in the pre-ignition section of the jet leading to similar efficiencies. There does appear to be a small decrease in efficiency at the max rpm which may be due to the slightly higher temperature that occurs at sensor position 2.

3.6 Thermal Efficiency

In this section the thermal efficiency of the jet is calculated. The thermal efficiency gives us an overview of the jets overall efficiency. The same assumptions from the previous section are used. The following equation will be used to calculate the efficiency at each steady operation state:

$$\eta = \frac{(h_3 - h_4) - (h_2 - h_1)}{h_3 - h_2} \tag{7}$$

A sample calculation is provided in Appendix A.7. The thermal efficiency was calculated for each steady operation state and graphed in Figure 8.

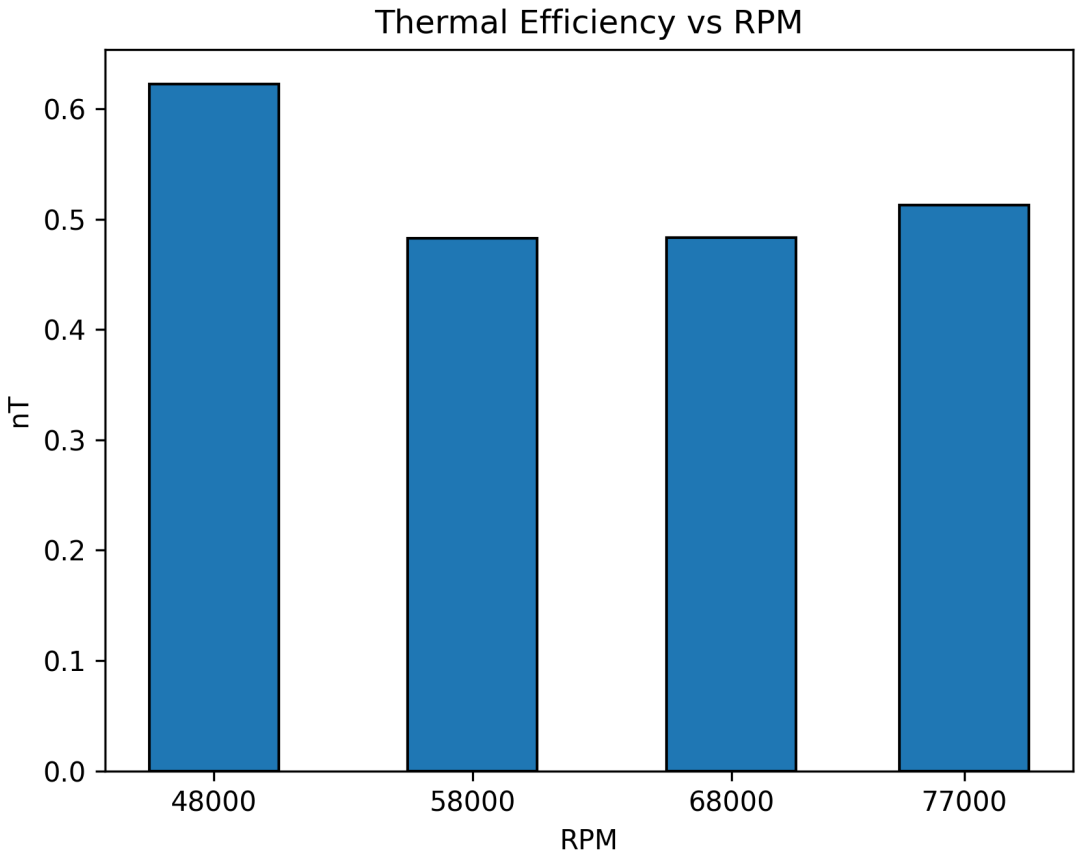

Figure 8: Thermal Efficiency (η) vs RPM

From Figure 8, the thermal efficiency decreases from the idle position to 58000 for the rpm

value. It then remains constant to 68000 and goes slightly up for the 77000 rpm value. Once again, there could be a slight issue with the first thermal efficiency value at the 48000 rpm value due to the oddities mentioned with h_2 previously. However, a slight decrease / constant trend is expected for the thermal efficiency due to the fact that the increase in the rpm will not drastically change enthalpy in the pre-ignition section of the jet leading to similar efficiencies. There is a slight increase in efficiency at the max rpm value at the end, which could be attributed to a slight sensor defect at that position; once again, the trend to be expected at the max rpm value would be an extremely slight decrease or continuation of the constant trend. However, the increase is very slight so the issue is minor.

3.7 Specific Fuel Consumption

This section outlines the calculation of the specific fuel consumption (SFC) at each steady operation state. The specific fuel consumption allows one to understand how fuel efficient the turbojet engine is relative to the thrust that the turbojet provides. In SI units the SFC is the ratio of the rate of the mass of fuel burned per time to the force of the thrust at that condition and is usually presented with units of $\frac{mg}{Ns}$ [4]. The following equation is used to calculate the SFC:

$$SFC = \frac{\text{mass of fuel burned per second}}{\text{Thrust}} \tag{8}$$

The mass of fuel burned per second can be found by the fuel flow section in Table 2. The thrust can also be found in the same table. However there must be a conversion performed as the units found in the raw measurements do not line up with the typical presentation units:

$$SFC = \frac{\text{mass of fuel burned per second}}{\text{Thrust}} * \frac{1000}{3600} \tag{9}$$

It is assumed that $1L$ of jet fuel equals $1000mg$. A sample calculation is provided in Appendix A.8. The SFC values for each steady operation states were calculated and then graphed in Figure 9:

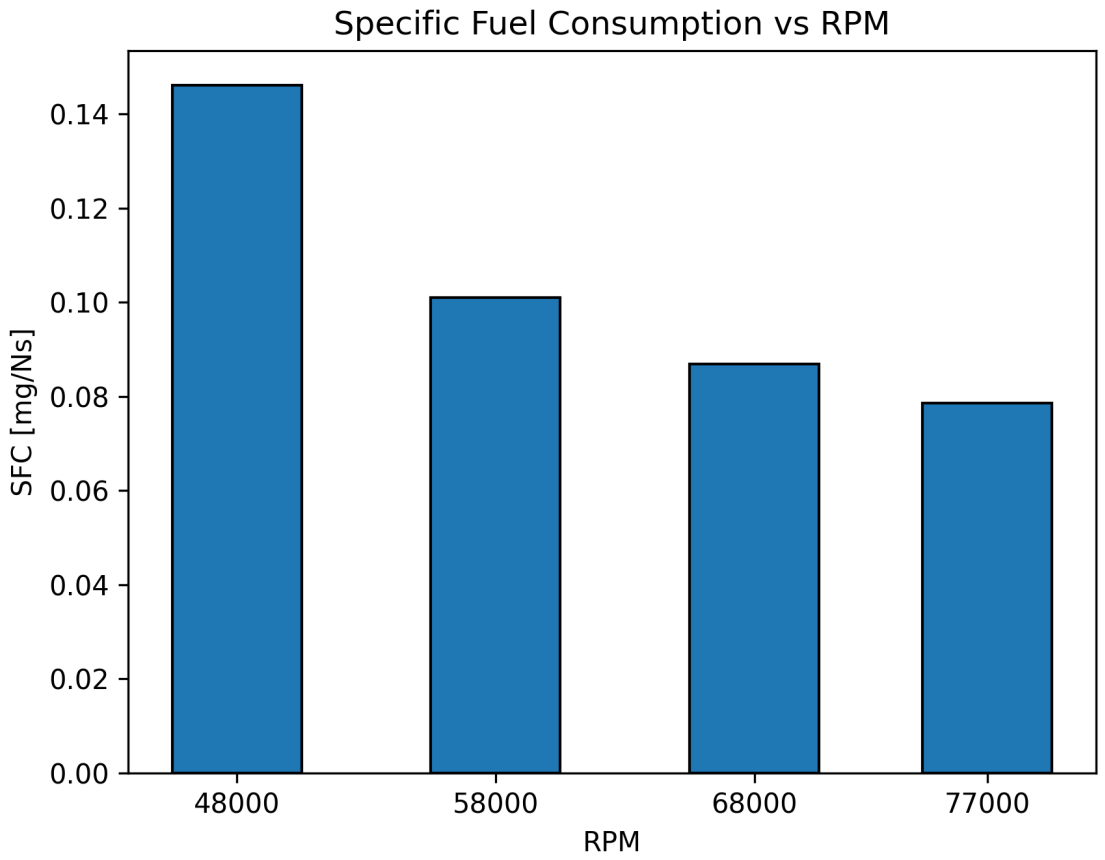

Figure 9: Specific Fuel Consumption (SFC) vs RPM

From Figure 9 it can be noted that the specific fuel consumption decreases as the jet rpm increases. While at first this may seem counter intuitive it makes sense once one looks at the fuel consumption and the thrust produced. The graphs shows that as the rpm increases, the thrust produced increases at a greater rate than the fuel consumed. This makes sense from a design perspective as the engine would be expected to be optimized for non idle rpm positions, which Figure 9 demonstrates as the SFC decreases. This indicates that less fuel is used to produce a unit of thrust.

3.8 Exit Mach Number

Utilizing the assumption of an isentropic process, the following formula can be used:

$$M_{isentropic} = \sqrt{\left(\left(\left(\frac{p_{0freestream}}{p}\right)^{\frac{\gamma-1}{\gamma}}\right)-1\right)*\frac{2}{\gamma-1}} \tag{10}$$

In this equation, the only value that varied for each corresponding RPM value was the value of $p_{0freestream}$ as gamma was equal to 1.4 and p was 97.6 kPa. One additional point to note is that all values had to be in SI units to maintain the proper conversion/cancellations of units when calculating the Mach number. A sample calculation can be seen in Appendix A.9. This calculation was performed for each data point to allow the mach number to be plotted against the RPM. This was able to be done as the exit static pressure stays constant and thus the only value that changes with rpm being the absolute stagnation pressure. The result of this calculation can be seen in Figure 10:

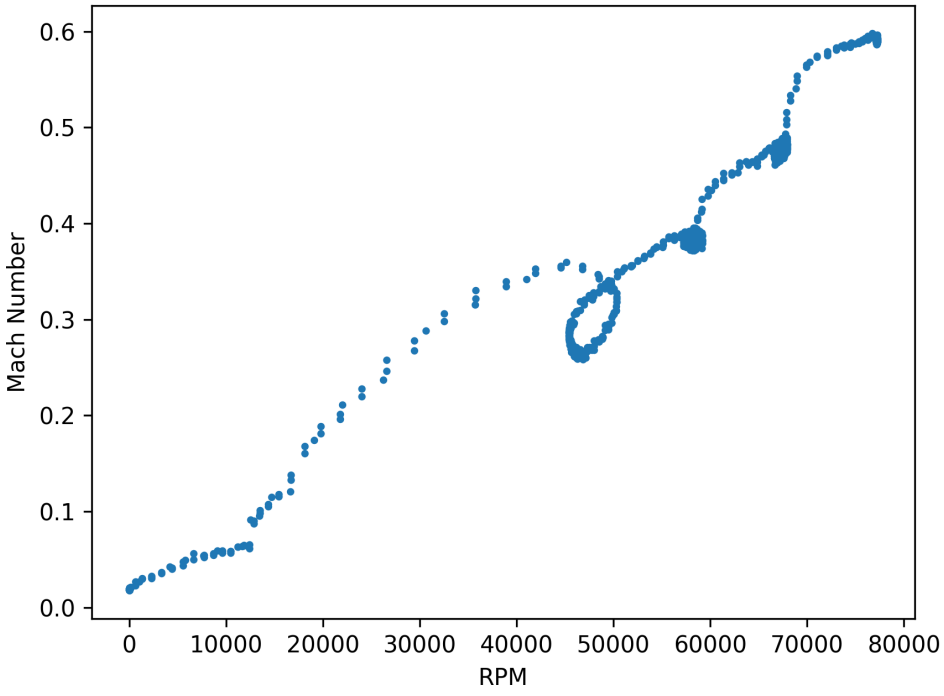

Figure 10: Mach Number vs RPM

This overall linear increase trend as shown in 10 is quite easy to explain. Due to the increase in rpm values, the Mach number is therefore continuously going up during this process since the ratio of the flow velocity past the boundary to the local speed of sound keeps gradually increasing. If the maximum rpm value were higher than 77000, the Mach number would be shown to be getting even higher than 0.6 as the graph shows. An interesting observation occurs at where the jet is held at a constant rpm which are denoted by the clumping of points as there are many calculations in a small range of rpm's. The first clumping, denoted by the big loop, occur at idle. This seems to be much more spread out as compared to the three other constant state positions which seem to indicate that the pressure readings at lower rpm's are not as accurate as those at higher rpm's where the points are much closer together. The spreading out of points at 48000 rpm may also have something to do with the jets start up procedure as it overshoots and then comes back down to the desired idle rpm. This trend is also seen in Figures 11 and 12.

3.9 Exit Velocity

To calculate exit velocity, the following equation was used:

$$V_{exit} = M_{exit} \sqrt{\gamma R T_{exit}} \tag{11}$$

In this equation, M_{exit} was calculated in the previous subsection and shown graphically in Figure 10. T_{exit} is equal to T_4. Therefore, for each RPM value, the value for M_{exit} and T_{exit} were acquired from the data and utilized to find and plot the values of V_{exit}. A sample calculation for this can be seen in Appendix A.10. The result of these calculations is shown in Figure 11

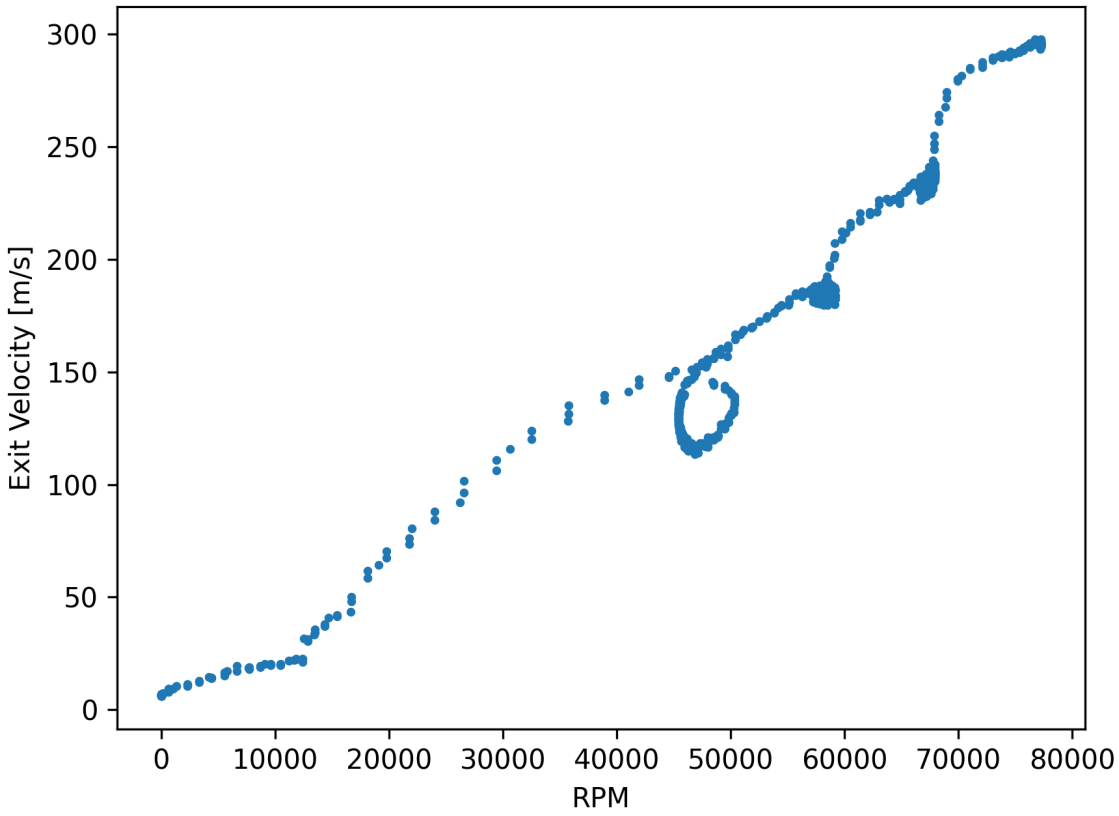

Figure 11: Exit Velocity [m/s] vs RPM

As previously mentioned, the Mach number increases as the RPM values are increased. Since the Mach number is quite literally the ratio of flow velocity past a boundary to the local speed of sound, it is obvious that the exit velocity should follow the same increasing trend. As Mach number goes up or down, the exit velocity will respond in exactly the same way by going up or down.

3.10 Calculated v.s. Measured Thrust

The first step in calculating the thrust produced by the jet is to find the density of the exiting air. This is done by using the following equation:

$$\rho = \frac{P_{exit}}{RT_{exit}} \tag{12}$$

In the above equation P_{exit} is the measured pressure in Pa, R is the gas constant, and T_{exit} is the temperature of the exiting air in K. A sample calculation is provided in Appendix A.11. This calculation is done for each data point to understand how the rpm effects the exit density. Once the density is calculated the mass flow ($\dot{m}$ can be calculated using the following equation:

$$\dot{m} = \rho A_{exit} V_{exit} \tag{13}$$

By taking the ρ and V_{exit} calculated for each data point and multiplying it by the exit area A_{exit} the mass flow is able to be found. A sample calculation is available in Appendix A.12. Now that the exit density and exit mass flow have been calculated the following equation can be used to calculate thrust:

$$Thrust = \dot{m} V_{exit} + A_{exit}(P04 - P4) \tag{14}$$

Again the above calculation must be performed for each data point using the corresponding values. A sample calculation is provided in Appendix A.13. Once the calculations were completed for all data point they were plotted against the rpm on the following graph:

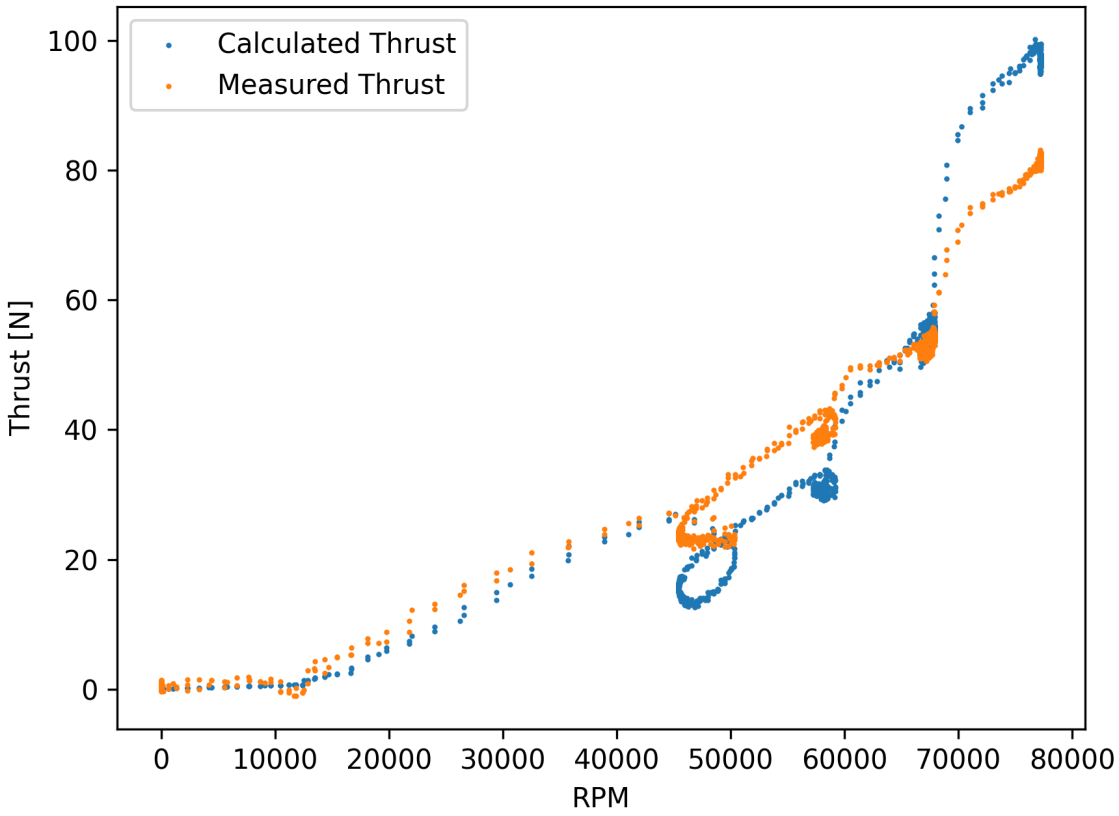

Figure 12: Thrust [N] vs RPM

The trends for the calculated thrust and measured thrust are quite similar with the calculated thrust being higher at the max rpm value and the measured thrust being a bit higher at the rpm value of 48000. The increasing trend in thrust can be attributed to the inherent proportional relationship between thrust and RPM on a jet engine. Since mass flow is increasing, using the standard thrust equation, it is easy to see that thrust will also increase accordingly. For the exit conditions, the calculated thrust, as mentioned before, was higher than the measured thrust. This could be due to the fact that the sensors did not relay the data necessary to match the calculated value due to an inherent delay in the instrumentation. Another reason for this could be that when considering the calculated values vs. the measured values, external factors such as bringing the throttle position back to its default or shutting off the engine itself cannot be done instantaneously. Therefore, the measured values will be slightly different at these boundary exit conditions.

4 CONCLUSIONS

The goal of this lab was to measure and analyze flow properties within the SR-30 turbojet using pressure and temperature sensors. Increasing the throttle (RPM) and holding close to the target RPM values of IDLE, 56000, 70000, and full throttle, allowed for the collection of more accurate data by taking the averages of the sensor readings. Figure 6 displays the graph of RPM values throughout time. The highlighted regions correspond to the time the throttle settings were held and the region in which averages were taken for all sensor readings. It is important to note that the RPM values in the graph were slightly off from the target RPMs which is due to human error. Also, for every step in the graph, the RPM values initially overshoot the desired value before eventually settling down. To account for any fluctuations in RPM at the target values, ±1000 RPM were included as part of the steady operation regime. Table 2 compiles the averages for each sensor reading corresponding to steady operation at the target values. Through interpolation of a temperature-enthalpy lookup table, enthalpy values for each sensor could be solved. Static pressures for each sensor were then used to calculate the relative pressures. This data was collected in Table 2. In order to find the compressor and thermal efficiencies, two assumptions were made: the compressor and turbine processes are isentropic, and the pressure is constant through the combustor and after exiting the turbine. Plotting the isentropic compressor efficiency vs RPM in Figure 7 shows that the greatest efficiency is achieved when the RPM is 48,000. The efficiency then seems to remain almost constant with the greater RPM values with a very slight decrease with an increase in RPM. Figure 8 displays the thermal efficiency with corresponding RPM and shows a similar trend to the compressor efficiency. The highest efficiency occurs for 48,000 rpm with 58,000 and 68,000 rpms showing a similar efficiency. It is important to note the rise in efficiency for the full throttle position. SFC values were calculated using the thrust and fuel flow averages and are graphed in Figure 9. This graph shows a decreasing SFC with an increase in RPM. Exit Mach number and exit velocity are plotted in Figures 10 and 11 respectively. Both figures show an increase in Mach and velocity with an increase in RPM. It is important to note the spiral that occurs

at approximately 50,000 rpm on both graphs. With the exit velocity found, thrust was calculated and plotted against the measured thrust by the Futek load cell in Figure 12. From the figure, the calculated thrust serves as a good approximation for the measured thrust. For RPM values greater than 70000, the error between both thrusts increases and the calculated thrust greatly overshoots the measured thrust.

This lab provides room for improvement in terms of extracting more accurate data. Since our measured RPM values were slightly off from the target values, trying to reduce human error by moving the throttle lever slower could yield closer values. Also, by holding the steady operation RPM for one minute rather than 10-20 seconds can provide better sensor reading averages and thus more reliable data.

5 REFERENCES

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6 GROUP MEMBER CONTRIBUTIONS

Group Member	Contribution to Laboratory Note for Experiment 3
Shyam Thyagarajan	Apparatus (2), Results and Discussions (3.1-3.10), Proofreading/Edits
Blizhaid Estrada	Introduction (1), Conclusions (4)
Dylan D'Silva	
Prahersh Kumar	Results and Discussions (3.1-3.10), Sample Calculations (Appendix A.1-A.13), Raw Data

APPENDIX

A Sample Calculations

A.1 Property Average Calculations

The following calculation is done for the finding the average temperature at the T1 probe at the first constant RPM (480000):

$$\begin{aligned}\text{Average T1 [C]} &= \frac{\sum T_i}{\text{Index Count}} \\ &= \frac{T1_1 + T1_2 + ... + T1_{51} + T1_{52}}{52} \\ &= \frac{23.729 + 23.729 + ... + 23.182 + 23.267}{52} \\ &= 23.362°C\end{aligned}$$

The procedure outlined above can be used to find all the other average

A.2 Linear Interpolation

The following example of linear interpolation for the enthalpy value corresponding to T1 at 48000 rpm:

$$y = y_1 + (x - x_1)\frac{(y_2 - y_1)}{(x_2 - x_1)}$$

$$\begin{aligned}h &= h_1 + (T - T_1)\frac{(h_2 - h_1)}{(T_2 - T_1)} \\ &= 296.688\frac{kJ}{kg}\end{aligned}$$

This method can be used to interpolate any value by substituting out the appropriate variables and solving.

A.3 P1 Static Pressure

This sample calculation is done for P1 at a steady state operation of 48000 rpm:

$$\begin{aligned} P1 &= P_{amb} - P_{1,vac} \\ &= 97.6 - 1.548 \\ &= 96.052 \text{ kPa} \end{aligned}$$

A.4 P2/P3 Static Pressure

This sample calculation is done for P2 at a steady state operation of 48000 rpm:

$$\begin{aligned} P2 &= P_{gauge} + P_{amb} \\ &= 54.241 + 97.6 \\ &= 151.841 \text{ kPa} \end{aligned}$$

A.5 p_{r2}

This sample calculation is done for p_{r2} at a steady state operation of 48000 rpm:

$$\begin{aligned} p_{r2} &= \frac{P2}{P1} * p_{r1} \\ &= \frac{151.841}{96.052} * 1.330 \\ &= 2.103 \end{aligned}$$

A.6 Isentropic Compressor Efficiency

The following calculation is performed for the following steady state $rpm \approx 58000$:

$$\begin{aligned}\eta_c &= \frac{h_{2s} - h_1}{h_2 - h_1} \\ &= \frac{361.857 - 296.906}{380.148 - 296.906} \\ &= 0.7802\end{aligned}$$

A.7 Thermal Efficiency

The following calculation is performed for the following steady state $rpm \approx 58000$:

$$\begin{aligned}\eta &= \frac{(h_3 - h_4) - (h_2 - h_1)}{h_3 - h_2} \\ &= \frac{(946.096 - 590.184) - (380.148 - 296.906)}{946.096 - 296.906} \\ &= 0.4818\end{aligned}$$

A.8 Specific Fuel Consumption

The following calculation is performed for the following steady state operation rpm: $rpm \approx 48000$:

$$\begin{aligned}SFC &= \frac{\text{mass of fuel burned per second}}{\text{Thrust}} * \frac{1000}{3600} \\ &= \frac{12.228}{22.936} * \frac{1000}{3600} \\ &= 0.1481 \frac{mg}{Ns}\end{aligned}$$

A.9 Mach Number

The following calculation was done for the following rpm: 47539.318:

$$\begin{aligned} M_{exit} &= \sqrt{\left(\left(\frac{P_{04}}{P4_{static}}\right)^{\frac{\gamma-1}{\gamma}} - 1\right) * \frac{2}{\gamma - 1}} \\ &= \sqrt{\left(\left(\frac{97.6 + 5.180}{97.6}\right)^{\frac{1.4-1}{1.4}} - 1\right) * \frac{2}{1.4 - 1}} \\ &= 0.273 \end{aligned}$$

A.10 Exit Velocity

The following calculation was done for the following rpm: 47539.318:

$$\begin{aligned} V_{exit} &= M_{exit}\sqrt{\gamma RT4} \\ &= 0.273 * \sqrt{1.4 * 287 * 476.351} \\ &= 119.357\ m/s \end{aligned}$$

A.11 Density at Exit

The following calculation was done for the following rpm: 47539.318:

$$\begin{aligned} \rho &= \frac{P4}{RT4} \\ &= \frac{1000 * 5.180}{287 * 476.351} \\ &= 0.03789\ kg/m^3 \end{aligned}$$

A.12 Mass Flow at Exit

The following calculation was done for the following rpm: 47539.318:

$$\begin{aligned} \dot{m} &= \rho * A_{exit} * V_exit \\ &= 0.03789 * 119.357 * 0.0025 \\ &= 0.0113\ kg/s \end{aligned}$$

A.13 Thrust

The following calculation was done for the following rpm: 47539.318:

$$\begin{aligned} Thrust &= \dot{m}V_{exit} + A_{exit}(P4_{static} - P4) \\ &= 0.0113 * 119.357 + 0.0025 * 5.180 * 1000 \\ &= 14.301\ N \end{aligned}$$

B Raw Data

We did not use the sheet to record any raw data and hence there is no attached sheet to this lab.

Time (sec)	RPM	T1 (C)	T2 (C)	T3 (C)	T4 (C)	P1 (kPa)	P2 (kPa)	P3 (kPa)	P4 (kPa)
329.625	2.032	23.726	23.44	23.152	23.752	0.016	0.002	0.083	0.025
329.824	6.05	23.693	23.56	23.542	24.211	0.017	0.009	0.085	0.023
330.025	5.638	23.763	23.501	22.754	23.825	0.016	-0.011	0.071	0.023
330.225	4.757	23.688	23.624	23.806	23.646	0.017	-0.004	0.09	0.023
330.426	6.705	23.732	23.668	22.941	24.15	0.017	0.011	0.072	0.024
330.627	5.573	23.76	23.5	22.924	23.631	0.016	-0.012	0.079	0.024
330.826	6.196	23.763	23.501	23.377	23.937	0.017	0.001	0.083	0.023
331.026	5.961	23.756	23.565	23.402	23.625	0.017	-0.013	0.086	0.023
331.227	5.04	23.685	23.618	22.945	24.142	0.017	0.001	0.086	0.024
331.427	7.368	23.783	23.561	23.171	23.61	0.016	-0.002	0.077	0.025
331.628	2.282	23.65	23.483	23.562	24.096	0.016	-0.004	0.089	0.024
331.829	1.506	23.619	23.573	23.46	24.138	0.017	0.008	0.094	0.025
332.029	5.751	23.722	23.578	22.923	23.793	0.017	0.003	0.082	0.023
332.229	2.743	23.632	23.498	22.924	24.287	0.017	-0.015	0.086	0.023
332.429	4.886	23.742	23.534	23.085	23.366	0.016	-0.009	0.08	0.024
332.63	4.862	23.69	23.602	23.656	23.438	0.017	-0.005	0.092	0.022
332.83	5.355	23.775	23.546	23.426	23.505	0.017	-0.015	0.079	0.025
333.031	4.28	23.659	23.568	23.486	23.958	0.017	-0.008	0.086	0.022
333.23	3.552	23.642	23.58	23.653	23.946	0.017	-0.008	0.094	0.024
333.43	2.234	23.64	23.569	23.643	23.787	0.017	0.001	0.092	0.025
333.63	5.864	23.728	23.501	23.112	23.823	0.017	-0.002	0.076	0.023
333.831	1.296	23.715	23.479	23.821	23.897	0.016	0.003	0.084	0.025
334.031	4.991	23.761	23.559	24.05	23.546	0.017	-0.004	0.078	0.025
334.232	3.334	23.738	23.445	23.578	23.887	0.016	-0.01	0.071	0.024
334.434	3.334	23.656	23.585	23.331	23.475	0.017	0.015	0.093	0.024
334.634	3.059	23.694	23.583	23.394	23.734	0.017	0	0.088	0.025
334.836	5.929	23.735	23.655	22.987	23.559	0.017	0.003	0.088	0.024
335.036	4.037	23.811	23.519	23.721	23.736	0.017	-0.001	0.081	0.024
335.237	4.692	23.827	23.555	23.209	23.991	0.016	-0.004	0.088	0.024
335.436	5.29	23.757	23.557	23.559	24.128	0.017	-0.007	0.082	0.024
335.636	3.511	23.739	23.656	22.392	24.052	0.017	0.004	0.074	0.023
335.836	5.509	23.803	23.546	23.254	23.806	0.016	-0.012	0.083	0.023
336.037	4.514	23.757	23.623	23.106	24.113	0.017	0.006	0.082	0.022
336.237	5.387	23.738	23.632	23.326	23.754	0.017	0.002	0.078	0.024
336.436	3.172	23.78	23.497	23.028	23.449	0.016	-0.01	0.082	0.025
336.636	4.538	23.78	23.551	23.305	23.8	0.016	-0.012	0.081	0.024
336.837	5.856	23.725	23.625	23.078	23.941	0.017	-0.002	0.082	0.023
337.036	2.646	23.752	23.487	23.25	23.668	0.016	-0.004	0.081	0.025
337.237	4.425	23.678	23.695	23.184	23.806	0.017	0.003	0.079	0.024
337.436	4.013	23.763	23.47	23.392	23.841	0.016	-0.003	0.081	0.023
337.638	4.288	23.649	23.606	23.626	23.809	0.017	0	0.081	0.022
337.838	6.317	23.75	23.617	23.408	23.409	0.017	-0.004	0.094	0.023
338.039	0.827	23.686	23.478	23.335	23.532	0.016	0.003	0.09	0.022
338.238	4.902	23.733	23.584	22.934	23.316	0.017	0.003	0.08	0.023

338.439	5.646	23.76	23.539	22.919	23.799	0.017	0.006	0.071	0.022
338.64	5.032	23.739	23.536	23.333	23.546	0.017	-0.007	0.087	0.023
338.839	-0.03	23.713	23.471	23.574	24.299	0.016	0.003	0.083	0.024
339.039	0.334	23.662	23.502	23.96	23.71	0.017	-0.011	0.076	0.024
339.239	4.902	23.666	23.672	23.043	23.66	0.017	0.004	0.083	0.022
339.439	2.614	23.683	23.641	23.601	23.361	0.017	0.005	0.069	0.023
339.639	1.822	23.744	23.489	23.428	23.894	0.016	0.005	0.08	0.022
339.841	1.288	23.672	23.606	23.795	24.073	0.017	0.001	0.084	0.023
340.04	3.843	23.717	23.576	23.681	23.538	0.017	0.005	0.095	0.023
340.241	1.45	23.71	23.48	23.739	23.889	0.016	-0.002	0.091	0.023
340.44	4.166	23.706	23.632	23.07	23.89	0.016	-0.011	0.097	0.021
340.64	5.581	23.778	23.555	23.387	23.777	0.016	0	0.092	0.024
340.84	5.088	23.713	23.651	23.582	23.574	0.017	-0.008	0.08	0.022
341.041	4.215	23.79	23.515	23.326	24.057	0.017	0.001	0.081	0.023
341.24	2.185	23.676	23.582	23.328	24.07	0.017	0.013	0.085	0.022
341.441	1.87	23.738	23.475	23.495	23.687	0.016	-0.009	0.081	0.023
341.64	2.161	23.757	23.463	22.79	23.692	0.016	0	0.083	0.023
341.841	5.153	23.767	23.597	22.798	23.91	0.017	0.002	0.072	0.022
342.041	2.962	23.792	23.51	23.472	23.825	0.017	-0.007	0.085	0.024
342.242	2.84	23.748	23.471	23.138	23.846	0.016	0	0.095	0.024
342.443	3.358	23.675	23.631	23.031	24.133	0.017	-0.004	0.09	0.024
342.643	1.369	23.694	23.566	23.639	24.051	0.017	-0.004	0.096	0.024
342.843	3.972	23.709	23.593	23.755	23.461	0.017	0.001	0.08	0.024
343.042	2.784	23.796	23.499	22.908	23.607	0.016	-0.007	0.091	0.025
343.242	3.681	23.754	23.514	23.497	24.003	0.016	0.001	0.093	0.024
343.442	3.875	23.71	23.617	23.315	24.271	0.017	-0.008	0.082	0.023
343.644	0.455	23.646	23.521	23.562	24.028	0.016	0.019	0.088	0.024
343.843	5.614	23.718	23.622	23.518	24.117	0.017	0.002	0.086	0.024
344.043	2.816	23.706	23.66	23.896	23.448	0.017	0.007	0.081	0.025
344.244	3.73	23.746	23.583	23.429	23.903	0.017	0.003	0.081	0.024
344.443	0.552	23.668	23.505	22.853	23.8	0.016	-0.002	0.079	0.023
344.643	2.921	23.658	23.596	23.237	23.782	0.017	0	0.088	0.024
344.844	1.142	23.676	23.455	23.548	23.691	0.016	-0.011	0.082	0.023
345.044	4.061	23.668	23.591	23.753	23.587	0.017	-0.001	0.087	0.024
345.246	1.053	23.703	23.429	23.21	23.654	0.016	0.001	0.081	0.025
345.446	1.87	23.746	23.469	22.791	23.849	0.016	0.002	0.077	0.024
345.647	2.137	23.746	23.472	23.412	23.399	0.016	-0.005	0.083	0.024
345.847	2.096	23.655	23.61	23.366	23.419	0.017	0.005	0.076	0.024
346.047	2.468	23.736	23.533	23.669	23.858	0.016	0.005	0.085	0.023
346.247	1.911	23.658	23.636	22.781	24.019	0.017	0.018	0.081	0.022
346.448	2.113	23.77	23.501	23	23.739	0.016	-0.006	0.07	0.024
346.649	2.76	23.752	23.447	22.838	24.156	0.016	-0.004	0.076	0.026
346.848	4.231	23.788	23.491	22.996	23.434	0.017	-0.004	0.083	0.023
347.05	0.568	23.685	23.578	23.582	24.024	0.016	0	0.077	0.023
347.249	4.951	23.807	23.522	23.32	23.648	0.016	-0.001	0.074	0.025

347.45	2.105	23.752	23.532	23.19	23.572	0.016	-0.009	0.075	0.024
347.65	2.258	23.696	23.617	23.851	23.718	0.017	0	0.077	0.023
347.852	3.568	23.799	23.58	23.099	23.916	0.017	-0.003	0.078	0.024
348.051	1.749	23.7	23.632	23.079	23.987	0.017	0.005	0.09	0.024
348.252	4.207	23.82	23.543	23.948	23.84	0.016	-0.001	0.08	0.024
348.451	1.264	23.738	23.481	23.039	23.667	0.016	-0.01	0.089	0.024
348.651	5.12	23.751	23.613	23.633	24.105	0.017	0.011	0.083	0.023
348.853	1.87	23.67	23.61	23.19	23.971	0.016	0.009	0.096	0.025
349.053	3.641	23.709	23.621	23.292	23.904	0.017	0.003	0.081	0.024
349.253	2.679	23.694	23.657	23.038	24.122	0.017	0.001	0.097	0.025
349.453	4.409	23.747	23.673	22.774	23.061	0.016	-0.005	0.09	0.024
349.654	4.449	23.736	23.601	23.466	23.687	0.017	0.002	0.072	0.024
349.853	3.762	23.742	23.658	23.243	23.658	0.017	-0.002	0.08	0.024
350.054	4.902	23.791	23.546	23.053	23.717	0.016	-0.007	0.083	0.024
350.253	4.474	23.67	23.641	23.373	23.316	0.017	-0.002	0.077	0.024
350.453	0.73	23.741	23.423	23.576	24.15	0.017	-0.001	0.081	0.026
350.653	0.787	23.691	23.482	22.975	24.309	0.017	-0.003	0.08	0.024
350.853	3.746	23.757	23.439	23.234	23.692	0.016	-0.007	0.079	0.022
351.053	2.501	23.727	23.408	23.027	23.548	0.016	0.002	0.066	0.025
351.254	3.358	23.765	23.494	23.39	23.838	0.016	-0.012	0.072	0.024
351.454	2.291	23.779	23.501	23.004	23.803	0.016	-0.011	0.071	0.025
351.655	0.245	23.655	23.525	23.384	23.65	0.016	0.01	0.09	0.023
351.856	3.536	23.748	23.472	23.534	23.533	0.016	-0.005	0.085	0.025
352.055	0.124	23.66	23.516	23.723	24.147	0.016	-0.009	0.085	0.024
352.255	2.994	23.778	23.551	23.379	24.039	0.017	-0.006	0.087	0.023
352.456	2.679	23.694	23.588	23.383	23.742	0.017	-0.006	0.078	0.024
352.656	3.495	23.675	23.615	23.114	23.858	0.016	0.003	0.089	0.022
352.855	1.345	23.636	23.548	23.765	23.85	0.016	0	0.084	0.025
353.055	4.563	23.712	23.604	23.721	23.785	0.017	0.001	0.079	0.024
353.255	2.25	23.736	23.442	23.075	23.736	0.017	-0.009	0.08	0.025
353.456	3.786	23.65	23.545	23.271	23.988	0.017	0.009	0.088	0.024
353.655	1.175	23.631	23.474	23.139	24.08	0.017	0.004	0.098	0.024
353.856	1.029	23.648	23.476	23.263	24.021	0.016	0.002	0.089	0.023
354.056	3.156	23.61	23.559	23.554	23.916	0.016	0.014	0.076	0.026
354.256	3.77	23.667	23.563	23.469	24.025	0.017	0.011	0.083	0.023
354.456	4.902	23.732	23.499	23.17	24.054	0.016	-0.008	0.077	0.026
354.657	2.153	23.692	23.394	23.178	23.904	0.017	-0.008	0.096	0.022
354.857	2.46	23.656	23.401	23.508	23.969	0.001	0.049	0.16	0.026
355.056	5.8	23.74	23.682	22.92	23.45	0	0.047	0.149	0.029
355.256	161.26	23.615	23.743	23.137	23.832	0.008	0.054	0.168	0.028
355.456	160.015	23.693	23.501	23.265	24.246	0.015	0.1	0.195	0.03
355.656	200.58	23.665	23.386	23.267	23.951	0.022	0.138	0.218	0.031
355.856	629.048	23.702	23.639	23.223	23.887	0.037	0.204	0.287	0.036
356.057	627.617	23.801	23.51	22.945	23.65	0.051	0.287	0.363	0.049
356.257	1061.397	23.548	23.872	23.411	23.326	0.059	0.365	0.418	0.049

356.457	1362.389	23.574	23.575	22.821	23.752	0.065	0.442	0.508	0.061
356.657	1362.041	23.5	23.554	23.54	23.893	0.063	0.532	0.592	0.062
356.857	2283.37	23.626	23.679	23.249	23.832	0.064	0.608	0.67	0.064
357.058	2283.281	23.458	23.527	23.782	24.062	0.068	0.734	0.779	0.068
357.257	2323.393	23.467	23.843	23.397	23.625	0.07	0.833	0.873	0.072
357.459	3319.999	23.491	23.546	22.769	24.024	0.076	0.929	0.985	0.087
357.658	3324.413	23.531	23.82	23.364	23.941	0.078	1.065	1.088	0.092
357.858	4169.795	23.489	23.209	23.163	23.951	0.078	1.196	1.212	0.122
358.058	4420.673	23.502	23.407	23.069	23.462	0.088	1.34	1.173	0.111
358.259	4417.803	23.406	23.823	23.068	23.74	0.095	1.462	1.467	0.117
358.46	5536.742	23.532	23.576	22.993	24.086	0.11	1.608	1.595	0.129
358.66	5535.812	23.448	23.349	23.731	23.58	0.107	1.718	1.713	0.154
358.861	5782.477	23.446	23.474	23.561	23.654	0.121	1.841	1.854	0.167
359.061	6646.003	23.557	23.493	23.211	24.423	0.126	1.981	1.979	0.169
359.261	6642.882	23.494	23.273	23.082	23.948	0.133	2.095	2.106	0.216
359.462	7658.229	23.53	23.423	23.389	23.761	0.132	2.191	2.214	0.199
359.662	7710.389	23.599	23.599	23.021	23.486	0.137	2.337	2.312	0.187
359.863	7709.548	23.578	23.213	23.27	23.77	0.144	2.455	2.437	0.205
360.064	8698.602	23.506	23.463	23.282	23.727	0.14	2.565	2.543	0.201
360.264	8699.257	23.528	23.386	23.115	24.037	0.146	2.652	2.649	0.216
360.465	9117.221	23.486	23.323	23.56	24.169	0.161	2.732	2.739	0.239
360.666	9615.298	23.497	23.171	24.113	23.737	0.148	2.841	2.826	0.22
360.866	9615.443	23.522	23.498	23.528	23.612	0.15	2.9	2.904	0.239
361.067	10444.63	23.505	23.433	23.165	23.978	0.154	2.975	2.986	0.221
361.266	10449.133	23.689	23.569	23.459	23.592	0.157	3.073	3.047	0.234
361.466	10446.861	23.609	23.504	23.431	24.251	0.147	3.157	3.119	0.232
361.667	11191.352	23.767	23.534	23.077	23.958	0.154	3.246	3.194	0.271
361.867	11192.751	23.731	23.523	23.278	23.523	0.156	3.326	3.256	0.274
362.067	11680.453	23.744	23.236	23.277	24.062	0.15	3.403	3.315	0.278
362.268	11851.713	23.71	23.367	23.314	24.113	0.16	3.472	3.359	0.282
362.469	11854.179	23.705	23.663	23.223	23.78	0.16	3.502	3.397	0.29
362.668	12416.22	23.679	23.255	23.437	23.764	0.154	3.538	3.431	0.293
362.869	12415.775	23.691	23.268	23.302	24.2	0.152	3.575	3.468	0.259
363.069	12532.433	23.743	23.54	23.067	23.715	0.208	5.212	5.101	0.572
363.269	12893.347	23.671	23.607	26.06	24.416	0.28	5.453	5.319	0.557
363.47	12896.144	23.717	23.288	35.219	25.623	0.308	5.948	5.758	0.524
363.669	13428.438	23.757	23.616	48.89	27.574	0.33	6.318	6.23	0.626
363.869	13512.56	23.777	23.393	65.102	30.164	0.35	6.8	6.693	0.661
364.07	13510.628	23.709	23.36	83.582	32.55	0.368	7.513	7.205	0.704
364.269	14360.182	23.816	23.413	105.89	35.319	0.389	8.197	7.8	0.754
364.47	14363.925	23.78	23.476	130.785	37.965	0.427	8.675	8.452	0.79
364.67	14722.356	23.706	23.724	157.801	40.645	0.455	9.238	9.095	0.904
364.87	15417.032	23.826	23.367	186.185	43.425	0.473	9.808	9.734	0.948
365.072	15416.523	23.714	23.771	215.825	46.724	0.516	10.533	10.493	0.915
365.272	16653.179	23.807	23.621	245.412	49.638	0.566	11.225	11.23	0.999

365.471	16672.463	23.953	24.271	275.349	52.556	0.601	12.046	12.036	1.214
365.671	16672.884	23.802	22.322	305.135	54.818	0.636	12.795	12.834	1.307
365.871	18105.76	23.78	23.72	334.816	58.096	0.668	14.33	14.344	1.768
366.072	18109.819	23.922	23.785	362.121	61.426	0.75	15.811	15.798	1.944
366.272	19090.366	23.921	23.571	385.699	65.236	0.799	17.258	17.299	2.089
366.472	19769.024	23.869	23.931	407.754	69.573	0.878	18.861	18.871	2.268
366.673	19771.078	23.934	23.95	426.755	73.327	0.936	20.649	20.675	2.453
366.874	21755.37	24.142	23.913	442.883	78.138	1.007	22.522	22.507	2.651
367.073	21756.05	24.058	24.208	455.575	82.888	1.09	24.266	24.243	2.804
367.273	21992.204	24.333	24.184	467.08	87.386	1.161	26.633	26.627	3.087
367.474	24030.16	24.337	24.307	477.579	92.678	1.235	29.259	29.183	3.344
367.675	24031.55	24.474	24.448	485.698	97.726	1.416	31.69	31.69	3.589
367.875	26225.662	24.397	24.69	493.557	102.376	1.526	34.396	34.362	3.893
368.075	26603.709	24.529	24.809	499.9	107.84	1.58	37.383	37.388	4.212
368.276	26604.194	24.586	25.008	504.077	113.547	1.563	40.758	40.761	4.621
368.475	29454.915	24.587	25.219	507.93	117.573	1.52	43.984	43.904	4.989
368.675	29460.809	24.635	25.506	511.477	122.611	1.384	47.44	47.286	5.381
368.875	30648.354	24.633	25.697	514.229	126.694	1.137	50.872	50.801	5.806
369.075	32544.611	24.848	27.033	515.813	131.039	1.139	54.217	54.033	6.196
369.276	32547.199	24.849	26.102	517.362	134.288	1.126	57.288	57.125	6.559
369.476	35730.259	24.828	26.797	518.293	138.056	1.208	60.575	60.391	6.974
369.676	35749.212	24.738	26.963	518.057	140.985	1.311	63.363	63.124	7.268
369.877	35757.305	24.864	27.682	518.08	144.452	1.391	66.121	65.764	7.658
370.077	38942.743	24.765	27.962	516.784	147.015	1.456	68.389	68.122	7.868
370.277	38944.675	24.66	28.596	515.003	149.618	1.537	70.705	70.321	8.102
370.478	41048.868	24.713	29.006	512.946	151.949	1.642	72.414	72.211	8.224
370.677	41926.454	24.678	29.884	510.493	154.112	1.699	74.157	73.825	8.533
370.878	41927.441	24.735	30.012	507.849	156.749	1.742	75.414	75.04	8.775
371.077	44571.375	24.615	30.791	504.409	158.797	1.804	76.489	76.033	8.84
371.279	44576.048	24.608	31.237	501.089	159.951	1.846	77.187	76.753	8.908
371.479	45170.682	24.368	32.143	496.803	162.06	1.886	78.081	77.622	9.128
371.68	46815.803	24.479	32.669	492.527	163.698	2.244	75.824	75.446	8.907
371.881	46815.948	24.437	33.415	489.222	165.182	2.206	74.482	74.112	8.744
372.08	48416.858	24.494	33.991	487.895	165.911	2.167	73.301	72.915	8.473
372.282	48490.582	24.468	34.73	486.773	167.822	2.124	72.088	71.672	8.354
372.482	48494.932	24.375	35.609	486.797	169.153	2.072	70.945	70.521	8.237
372.682	49508.379	24.334	36.134	487.864	170.464	2.039	69.811	69.546	8.162
372.883	49509.932	24.411	36.754	488.506	171.255	2.013	68.855	68.551	7.975
373.083	49801.771	24.283	37.466	488.503	172.465	1.967	68.027	67.694	7.884
373.283	50072.919	24.296	38.137	488.734	173.526	1.943	67.175	66.837	7.736
373.483	50069.749	24.225	38.716	489.43	174.439	1.892	66.358	66.056	7.655
373.683	50314.352	24.105	39.402	489.753	176.037	1.873	65.584	65.219	7.532
373.883	50316.786	24.166	39.972	491.521	177.012	1.841	64.802	64.396	7.346
374.084	50319.39	24.068	40.594	492.219	177.626	1.824	64.083	63.728	7.259
374.284	50360.545	24.041	41.308	493.548	178.652	1.804	63.411	63.044	7.105

374.486	50355.492	23.953	41.885	495.085	179.763	1.782	62.72	62.347	7.094
374.686	50275.784	23.914	42.444	495.932	180.684	1.742	62.082	61.691	6.894
374.886	50264.723	23.988	42.917	496.825	181.353	1.734	61.469	61.095	6.702
375.086	50265.281	23.932	43.464	498.335	182.143	1.716	60.85	60.481	6.675
375.286	50070.113	23.781	44.053	500.097	182.978	1.701	60.29	59.909	6.612
375.487	50074.002	23.824	44.574	501.121	183.924	1.688	59.859	59.484	6.52
375.688	49959.446	23.729	45.076	502.174	185.126	1.681	59.439	58.994	6.468
375.888	49800.719	23.729	45.474	502.746	185.672	1.669	58.927	58.578	6.387
376.09	49803.84	23.753	46.029	503.953	186.842	1.649	58.601	58.18	6.143
376.292	49489.629	23.681	46.48	504.117	187.613	1.635	58.3	57.931	6.093
376.492	49489.289	23.63	46.963	504.768	188.158	1.646	57.929	57.452	5.976
376.693	49484.438	23.648	47.423	505.255	188.649	1.624	57.62	57.119	5.846
376.893	49158.688	23.606	47.868	505.566	190.02	1.627	57.283	56.857	6.033
377.094	49161.397	23.653	48.272	505.688	190.051	1.618	57.06	56.637	5.828
377.293	48908.45	23.646	48.606	505.557	191.343	1.629	56.841	56.436	5.528
377.493	48829.858	23.607	49.123	506.271	192.106	1.603	56.573	56.153	5.57
377.695	48832.26	23.661	49.458	506.876	192.418	1.616	56.388	55.957	5.456
377.895	48518.097	23.57	49.806	507.234	193.356	1.618	56.177	55.753	5.43
378.095	48520.296	23.501	50.316	507.361	193.91	1.608	55.991	55.434	5.333
378.295	48429.981	23.48	50.64	507.434	195.102	1.587	55.774	55.323	5.417
378.495	48237.731	23.474	51.006	508.296	195.684	1.583	55.618	55.196	5.384
378.695	48234.279	23.519	51.241	509.087	196.098	1.583	55.376	54.925	5.355
378.895	47983.644	23.449	51.74	509.222	196.717	1.586	55.28	54.806	5.15
379.096	47981.816	23.405	52.032	509.256	197.487	1.579	55.104	54.614	5.012
379.295	47981.169	23.427	52.357	510.493	198.143	1.58	54.874	54.405	5.38
379.497	47741.951	23.318	52.682	511.423	198.692	1.576	54.836	54.325	5.093
379.697	47743.406	23.314	53.006	512.382	199.981	1.57	54.617	54.134	5.012
379.897	47607.505	23.372	53.197	513.096	200.769	1.567	54.55	54.027	5.082
380.099	47532.576	23.368	53.657	513.399	200.679	1.549	54.311	53.865	5.111
380.298	47533.409	23.382	53.974	514.493	201.981	1.546	54.119	53.692	5.07
380.498	47339.664	23.26	54.307	515.908	202.556	1.539	54.049	53.584	5.087
380.699	47335.249	23.299	54.5	516.071	203.128	1.545	53.875	53.398	5.107
380.898	47314.009	23.301	54.873	516.516	203.457	1.541	53.824	53.378	4.959
381.098	47160.78	23.326	55.14	517.819	204.701	1.541	53.716	53.27	4.703
381.299	47162.688	23.239	55.461	518.038	205.363	1.522	53.59	53.162	4.886
381.498	47017.763	23.323	55.56	517.889	205.964	1.535	53.446	53.022	4.884
381.699	47001.446	23.219	55.942	519.194	206.96	1.528	53.233	52.857	4.874
381.9	47002.489	23.267	56.128	519.387	206.664	1.518	53.187	52.75	4.967
382.1	46855.349	23.234	56.533	520.1	207.505	1.524	53.068	52.65	4.642
382.301	46855.074	23.157	56.713	520.875	208.116	1.5	52.939	52.582	4.816
382.501	46797.61	23.167	56.969	521.931	209.012	1.499	52.922	52.519	4.701
382.701	46721.995	23.275	57.104	522.464	209.285	1.51	52.804	52.368	4.834
382.9	46718.971	23.206	57.323	521.745	210.566	1.516	52.646	52.249	4.733
383.102	46599.111	23.263	57.568	521.559	210.427	1.507	52.584	52.192	5.029
383.302	46596.443	23.141	57.902	521.009	211.547	1.511	52.518	52.13	4.862

383.501	46597.372	23.213	58.009	521.618	211.764	1.5	52.372	51.925	4.917
383.703	46487.83	23.199	58.399	522.313	212.72	1.494	52.231	51.863	4.872
383.903	46484.773	23.154	58.555	522.655	213.267	1.489	52.079	51.753	4.766
384.104	46405.236	23.187	58.701	523.652	213.638	1.488	52.038	51.667	4.78
384.304	46376.751	23.207	58.959	524.49	213.653	1.479	51.912	51.549	4.933
384.505	46376.274	23.176	59.166	525.384	215.238	1.484	51.847	51.445	4.927
384.707	46276.054	23.157	59.53	526.627	215.306	1.478	51.747	51.297	4.949
384.907	46276.369	23.245	59.612	527.741	215.511	1.483	51.677	51.285	4.661
385.106	46246.946	23.177	59.873	528.705	216.816	1.476	51.685	51.304	4.678
385.306	46174.807	23.199	60.049	529.379	217.322	1.471	51.641	51.194	4.91
385.507	46176.586	23.114	60.255	529.582	217.5	1.47	51.494	51.119	5.11
385.706	46085.154	23.118	60.35	528.849	217.81	1.459	51.44	51.066	5.063
385.907	46085.502	23.182	60.572	530.397	218.241	1.455	51.309	50.98	4.847
386.106	46091.663	23.267	60.751	530.422	219.006	1.452	51.303	50.895	4.912
386.307	46007.93	23.298	60.934	530.801	219.51	1.445	51.204	50.862	4.99
386.507	46009.498	23.309	61.138	531.783	219.985	1.459	51.21	50.814	4.741
386.708	45948.808	23.204	61.302	533.648	220.783	1.455	51.122	50.724	5.124
386.909	45931.538	23.263	61.525	534.457	220.851	1.474	51.08	50.7	4.768
387.108	45925.845	23.219	61.66	536.019	222.067	1.463	50.998	50.562	5.081
387.309	45863.482	23.331	61.791	537.267	221.556	1.45	50.967	50.628	5.164
387.508	45862.56	23.197	61.994	538.478	222.745	1.454	50.963	50.604	5.019
387.71	45850.812	23.288	62.092	540.096	223.225	1.453	50.932	50.534	5.014
387.91	45797.003	23.193	62.202	541.533	223.793	1.455	50.857	50.479	5.127
388.11	45800.657	23.273	62.419	543.091	224.069	1.442	50.8	50.423	5.168
388.31	45743.751	23.21	62.615	544.583	224.786	1.45	50.753	50.377	5.233
388.512	45736.636	23.205	62.737	545.723	225.513	1.44	50.772	50.399	5.135
388.711	45739.668	23.175	62.943	546.957	226.06	1.444	50.701	50.337	5.123
388.911	45692.077	23.249	63.153	548.526	226.276	1.443	50.7	50.342	5.155
389.112	45690.88	23.27	63.217	549.732	227.123	1.444	50.724	50.337	5.25
389.311	45673.205	23.168	63.372	550.537	227.328	1.446	50.693	50.272	4.916
389.513	45643.936	23.21	63.492	551.706	227.709	1.436	50.592	50.257	5.102
389.712	45643.741	23.163	63.683	552.262	228.305	1.441	50.612	50.265	5.315
389.912	45608.076	23.222	63.891	553.217	228.513	1.453	50.587	50.24	5.134
390.112	45606.144	23.163	64.006	554.336	229.737	1.442	50.54	50.185	5.157
390.312	45604.915	23.249	63.958	554.368	230.029	1.438	50.545	50.15	5.356
390.512	45573.43	23.188	64.314	555.411	231.055	1.434	50.576	50.224	5.037
390.712	45575.71	23.261	64.341	556.391	230.853	1.441	50.505	50.08	5.411
390.913	45542.818	23.175	64.562	557.041	231.451	1.444	50.471	50.143	5.424
391.112	45542.106	23.276	64.658	557.179	231.806	1.433	50.459	50.05	5.247
391.314	45537.482	23.168	64.752	558.474	232.846	1.435	50.505	50.085	5.373
391.514	45512.182	23.187	64.913	559.215	232.913	1.437	50.48	50.088	5.309
391.716	45510.888	23.17	64.981	559.922	233.601	1.443	50.455	50.091	5.306
391.915	45511.026	23.251	65.297	561.056	234.393	1.447	50.441	50.084	5.197
392.117	45493.149	23.156	65.355	561.941	234.645	1.444	50.449	50.053	5.366
392.317	45494.58	23.288	65.445	562.029	235.231	1.429	50.42	50.079	5.349

392.516	45479.282	23.295	65.591	562.883	235.334	1.45	50.388	49.989	5.422
392.716	45476.023	23.248	65.707	563.792	236.349	1.443	50.444	50.046	5.346
392.916	45476.04	23.242	65.874	563.912	236.616	1.439	50.384	50.038	5.473
393.116	45465.189	23.321	65.989	564.332	237.146	1.442	50.343	49.992	5.428
393.316	45458.704	23.184	66.104	565.212	237.38	1.441	50.442	50.045	5.421
393.517	45459.278	23.293	66.288	565.588	237.535	1.443	50.445	50.063	5.3
393.717	45449.188	23.24	66.37	566.357	238.445	1.443	50.423	50.098	5.449
393.917	45452.996	23.308	66.539	566.6	239.111	1.451	50.423	50.018	5.38
394.117	45443.738	23.335	66.62	567.506	239.481	1.447	50.432	50.044	5.402
394.317	45442.242	23.304	66.85	568.234	240.534	1.452	50.39	50.042	5.436
394.518	45437.884	23.263	66.837	568.178	240.17	1.446	50.407	49.986	5.52
394.718	45434.852	23.244	67.005	568.681	241.503	1.454	50.467	50.038	5.684
394.92	45436.655	23.351	67.04	569.285	241.553	1.451	50.452	50.03	5.585
395.12	45434.561	23.323	67.325	570.065	241.911	1.446	50.425	49.997	5.549
395.321	45429.54	23.311	67.429	569.929	242.111	1.456	50.378	49.943	5.453
395.522	45432.548	23.298	67.576	570.833	243.312	1.443	50.437	50.054	5.575
395.722	45427.211	23.327	67.63	571.802	243.48	1.449	50.383	50.006	5.728
395.924	45430.049	23.406	67.771	571.99	243.824	1.446	50.42	50.02	5.583
396.124	45428.723	23.444	67.821	573.158	244.228	1.44	50.397	50.003	5.481
396.323	45429.766	23.485	67.913	573.355	244.82	1.437	50.373	49.965	5.673
396.523	45426.241	23.392	68.182	574.052	245.328	1.451	50.401	49.957	5.587
396.723	45424.543	23.436	68.117	574.332	245.814	1.452	50.399	49.982	5.611
396.924	45426.217	23.493	68.262	574.038	246.231	1.454	50.336	49.971	5.705
397.123	45425.812	23.506	68.311	574.868	246.676	1.444	50.408	50.028	5.625
397.324	45427.64	23.542	68.522	574.808	246.854	1.447	50.438	50.046	5.603
397.524	45421.454	23.409	68.624	575.692	248.142	1.441	50.397	50.028	5.756
397.725	45430.785	23.521	68.798	576.035	248.051	1.449	50.378	50.023	5.757
397.925	45426.395	23.472	68.731	576.584	248.852	1.446	50.376	50.029	5.806
398.125	45431.036	23.546	69.03	576.902	248.633	1.448	50.358	49.983	5.736
398.326	45428.618	23.456	69.101	576.707	249.871	1.439	50.418	50.03	5.772
398.526	45431.068	23.509	69.305	577.737	250.77	1.439	50.459	50.035	5.728
398.727	45436.307	23.561	69.385	578.519	250.437	1.441	50.456	50.07	5.499
398.927	45440.876	23.579	69.458	578.65	250.663	1.448	50.471	50.033	5.547
399.128	45434.529	23.466	69.439	578.973	251.294	1.438	50.433	50.084	5.7
399.327	45436.008	23.432	69.661	579.379	251.872	1.435	50.458	50.064	5.75
399.528	45440.091	23.538	69.661	579.03	251.906	1.445	50.454	50.074	5.684
399.728	45438.515	23.437	69.865	579.841	253.003	1.443	50.456	50.105	5.757
399.927	45448.298	23.486	69.889	579.079	253.15	1.438	50.451	50.076	5.833
400.127	45446.584	23.469	70.002	579.742	253.819	1.429	50.448	50.051	5.848
400.328	45452.624	23.434	70.163	579.727	254.42	1.432	50.46	50.067	5.887
400.527	45462.335	23.526	70.24	579.677	253.948	1.424	50.44	50.05	5.811
400.729	45460.604	23.511	70.357	580.384	254.832	1.439	50.435	50.085	5.922
400.928	45463.499	23.395	70.415	580.394	255.795	1.439	50.503	50.104	5.892
401.128	45467.776	23.498	70.508	581.187	255.812	1.447	50.54	50.086	5.889
401.329	45466.402	23.376	70.748	580.999	256.764	1.448	50.622	50.209	5.705

401.528	45477.196	23.47	70.717	580.885	257.12	1.448	50.521	50.094	5.889
401.729	45476.412	23.379	70.892	581.793	257.171	1.448	50.501	50.119	5.884
401.931	45486.818	23.425	70.999	582.355	257.581	1.455	50.519	50.13	5.915
402.131	45483.228	23.365	71.053	582.08	258.361	1.444	50.487	50.161	5.89
402.333	45489.251	23.471	71.169	582.447	258.362	1.446	50.496	50.116	5.948
402.534	45489.761	23.389	71.228	582.731	259.212	1.445	50.56	50.137	5.918
402.735	45490.925	23.417	71.256	583.098	259.07	1.444	50.563	50.136	5.729
402.934	45493.998	23.366	71.516	583.087	259.83	1.444	50.55	50.125	5.912
403.135	45505.131	23.517	71.557	583.211	259.938	1.447	50.543	50.099	5.962
403.335	45500.134	23.426	71.559	583.691	260.237	1.452	50.552	50.162	5.891
403.535	45511.204	23.498	71.809	583.303	260.934	1.449	50.465	50.072	5.946
403.736	45507.719	23.479	71.749	583.311	260.991	1.459	50.533	50.166	5.98
403.935	45509.586	23.422	71.946	583.755	261.896	1.449	50.531	50.181	6.035
404.136	45512.885	23.379	72.049	583.851	262.376	1.457	50.552	50.159	5.816
404.335	45514.842	23.406	72.138	583.729	262.699	1.452	50.565	50.176	5.979
404.536	45518.707	23.513	72.092	583.958	263.347	1.454	50.552	50.127	5.851
404.735	45518.028	23.393	72.317	583.871	263.515	1.451	50.534	50.158	5.896
404.936	45519.071	23.389	72.42	583.883	263.545	1.461	50.539	50.135	5.891
405.137	45525.232	23.537	72.426	584.341	263.268	1.448	50.497	50.133	5.922
405.336	45522.03	23.466	72.495	584.241	264.461	1.461	50.585	50.134	5.922
405.537	45528.216	23.472	72.695	585.165	264.515	1.465	50.568	50.134	5.876
405.737	45528.466	23.492	72.602	584.629	265.556	1.466	50.578	50.167	5.987
405.938	45532.937	23.534	72.834	585.291	265.699	1.46	50.596	50.168	5.926
406.137	45535.161	23.475	72.777	585.174	265.799	1.473	50.538	50.125	6.038
406.337	45538.63	23.478	72.97	585.638	266.22	1.454	50.598	50.18	5.986
406.538	45536.689	23.529	72.967	586.297	267.112	1.456	50.58	50.196	5.97
406.737	45539.568	23.428	73.08	586.1	266.947	1.454	50.635	50.175	6.055
406.937	45539.745	23.44	73.127	586.266	266.855	1.463	50.666	50.19	5.888
407.137	45541.33	23.406	73.262	586.892	267.438	1.455	50.671	50.264	5.89
407.338	45549.893	23.536	73.286	587.099	268.003	1.454	50.583	50.172	6.002
407.538	45547.111	23.447	73.392	586.936	268.516	1.449	50.639	50.25	5.927
407.738	45553.839	23.484	73.435	587.324	268.394	1.456	50.64	50.18	5.983
407.939	45556.313	23.505	73.515	587.074	268.832	1.451	50.569	50.15	6.173
408.14	45552.893	23.418	73.596	587.283	269.125	1.46	50.588	50.129	5.959
408.34	45561.698	23.461	73.803	587.354	270.028	1.455	50.566	50.121	6.09
408.54	45561.237	23.479	73.816	586.589	269.64	1.457	50.624	50.192	6.012
408.739	45558.771	23.449	73.778	586.433	270.352	1.449	50.577	50.163	6.003
408.94	45563.574	23.519	73.955	586.763	270.716	1.463	50.581	50.176	6.04
409.14	45562.336	23.475	74.047	586.89	270.803	1.466	50.632	50.173	5.977
409.341	45567.891	23.423	74.244	586.94	271.384	1.449	50.651	50.234	6.041
409.54	45570.01	23.527	74.238	587.582	271.868	1.463	50.631	50.221	5.893
409.741	45568.878	23.498	74.319	587.794	271.905	1.449	50.65	50.231	6.067
409.941	45574.109	23.576	74.305	588.556	272.144	1.464	50.644	50.233	5.923
410.142	45573.575	23.48	74.462	588.657	272.691	1.463	50.706	50.278	5.999
410.342	45578.799	23.495	74.452	587.988	273.099	1.467	50.686	50.268	6.1

410.542	45585.307	23.532	74.598	588.49	273.176	1.467	50.732	50.267	6.067
410.743	45582.825	23.553	74.602	588.986	273.733	1.463	50.649	50.268	6.065
410.943	45591.663	23.507	74.778	589.479	273.357	1.465	50.687	50.223	6.028
411.142	45591.63	23.592	74.718	589.076	273.978	1.467	50.763	50.295	6.036
411.343	45594.606	23.504	74.907	588.972	274.913	1.461	50.69	50.238	5.942
411.543	45595.94	23.572	74.818	588.844	274.568	1.461	50.74	50.3	6.03
411.743	45599.829	23.627	74.991	588.938	274.684	1.451	50.713	50.287	6.069
411.945	45610.817	23.607	75.112	589.241	274.964	1.461	50.728	50.293	6
412.144	45608.472	23.58	75.259	588.633	275.223	1.465	50.798	50.333	5.945
412.345	45608.44	23.598	75.189	589.533	275.619	1.46	50.758	50.334	6.009
412.544	45613.13	23.593	75.191	588.911	275.61	1.458	50.732	50.33	6.11
412.745	45613.663	23.623	75.291	589.193	276.621	1.461	50.724	50.31	5.982
412.946	45622.072	23.589	75.472	589.165	276.723	1.458	50.783	50.314	6.034
413.146	45622.59	23.655	75.47	589.569	276.708	1.46	50.763	50.35	6.019
413.345	45620.997	23.542	75.597	589.837	277.025	1.472	50.782	50.367	6.083
413.545	45629.163	23.595	75.579	589.645	277.317	1.457	50.739	50.305	6.092
413.746	45627.853	23.598	75.66	589.392	277.721	1.47	50.788	50.377	6.098
413.946	45636.392	23.644	75.761	590.358	277.714	1.461	50.781	50.347	6.099
414.147	45637.766	23.595	75.74	589.79	278.035	1.472	50.766	50.35	6.052
414.347	45638.098	23.611	75.928	589.48	278.719	1.468	50.837	50.399	6.088
414.546	45649.078	23.728	75.947	589.641	278.435	1.473	50.736	50.337	6.113
414.746	45650.436	23.696	76	589.696	278.791	1.468	50.815	50.36	6.011
414.946	45649.24	23.691	76.033	589.624	279.591	1.466	50.737	50.385	6.062
415.146	45652.183	23.609	76.233	589.77	279.624	1.455	50.759	50.363	6.083
415.347	45651.253	23.684	76.16	589.984	279.644	1.445	50.808	50.362	6.131
415.547	45657.01	23.59	76.347	590.263	279.736	1.441	50.965	50.533	6.079
415.747	45658.166	23.683	76.274	589.916	280.102	1.462	51.104	50.684	6.054
415.947	45658.748	23.594	76.422	590.353	280.301	1.462	51.319	50.94	6.016
416.148	45682.568	23.657	76.399	590.681	280.73	1.46	51.617	51.216	6.149
416.348	45686.805	23.675	76.574	591.307	280.978	1.459	52.047	51.597	6.071
416.549	45691.834	23.65	76.559	592.144	281.412	1.474	52.514	52.087	6.227
416.749	45762.663	23.582	76.653	593.436	282.188	1.476	53.024	52.582	6.087
416.95	45764.329	23.65	76.678	594.762	281.799	1.489	53.615	53.193	6.174
417.15	45910.92	23.582	76.974	596.918	282.301	1.504	54.192	53.827	6.051
417.35	45926.597	23.584	76.9	598.54	283.442	1.502	54.946	54.573	6.135
417.551	45929.945	23.658	76.888	601.746	283.489	1.516	55.877	55.362	6.53
417.751	46194.026	23.642	76.961	605.656	284.041	1.534	56.609	56.086	6.567
417.951	46192.829	23.542	77.11	609.041	284.67	1.551	57.312	56.759	6.663
418.15	46347.417	23.535	77.244	610.98	284.876	1.567	57.923	57.348	6.681
418.352	46559.629	23.527	77.37	612.939	284.809	1.578	58.614	58.055	6.716
418.551	46561.893	23.58	77.431	614.854	285.694	1.595	59.23	58.628	7.115
418.752	46989.472	23.53	77.566	616.396	286.062	1.604	59.814	59.208	6.978
418.952	46991.647	23.6	77.662	617.119	286.08	1.622	60.426	59.834	7.052
419.154	47002.279	23.624	77.814	618.728	286.662	1.63	61.029	60.427	7.213
419.353	47459.483	23.581	77.881	619.956	286.87	1.627	61.791	61.163	7.28

419.553	47460.696	23.542	78.203	621.094	287.513	1.665	62.449	61.827	7.406
419.753	47821.011	23.601	78.241	622.022	287.61	1.661	63.117	62.517	7.211
419.955	47965.411	23.545	78.313	623.891	287.725	1.677	63.977	63.422	7.362
420.154	47967.561	23.587	78.527	624.257	288.22	1.707	64.835	64.288	7.557
420.356	48514.102	23.48	78.739	626.53	289.007	1.727	65.605	65.118	7.593
420.555	48520.959	23.549	78.924	627.658	288.976	1.751	66.437	66.013	7.548
420.757	48693.027	23.574	79.065	628.184	289.508	1.775	67.405	66.879	7.856
420.956	49120.104	23.574	79.25	628.973	290.158	1.772	68.26	67.71	7.992
421.158	49115.439	23.475	79.435	629.957	290.298	1.803	69.32	68.884	7.731
421.357	49739.124	23.581	79.731	630.476	290.599	1.849	70.283	69.973	7.629
421.558	49751.39	23.484	79.953	632.316	290.969	1.868	71.404	70.907	8.135
421.758	49751.277	23.579	80.125	633.095	290.729	1.896	72.45	71.934	7.989
421.959	50417.103	23.501	80.321	635.092	291.895	1.934	73.489	72.894	8.623
422.158	50420.887	23.463	80.642	636.026	291.769	1.972	74.434	73.916	8.374
422.358	50834.324	23.532	80.695	636.383	292.144	2.007	75.336	74.772	8.631
422.559	51112.313	23.535	80.983	636.749	292.249	2.041	76.389	75.776	8.832
422.759	51109.547	23.402	81.39	637.302	292.981	2.074	77.32	76.671	8.774
422.959	51802.598	23.503	81.702	637.969	293.12	2.117	78.413	77.76	8.899
423.16	51801.191	23.542	81.792	639.169	293.267	2.164	79.397	78.734	8.951
423.36	51916.151	23.521	82.231	639.861	293.995	2.2	80.402	79.681	8.955
423.56	52496.449	23.484	82.342	640.941	293.988	2.245	81.313	80.569	9.221
423.76	52498.366	23.549	82.725	641.274	294.404	2.263	82.204	81.355	9.203
423.961	53162.292	23.466	83.111	642.27	294.864	2.287	83.011	82.165	9.351
424.161	53178.795	23.417	83.494	643.435	294.796	2.311	83.863	83.039	9.428
424.362	53179.199	23.523	83.652	644.669	295.399	2.329	84.667	83.825	9.463
424.563	53843.004	23.512	84.083	645.681	294.777	2.349	85.48	84.673	9.665
424.763	53836.641	23.479	84.343	646.089	296.014	2.373	86.303	85.587	9.602
424.963	54142.476	23.423	84.616	647.271	296.431	2.392	87.103	86.301	9.867
425.164	54477.451	23.431	84.986	647.499	296.01	2.419	87.911	87.112	9.979
425.364	54480.273	23.42	85.381	647.736	296.586	2.434	88.741	87.936	9.995
425.564	55107.855	23.427	85.696	647.795	296.912	2.45	89.481	88.782	9.963
425.764	55111.106	23.407	86.15	647.454	297.021	2.502	90.205	89.411	10.095
425.966	55146.819	23.486	86.464	648.543	296.998	2.501	91.105	90.247	10.268
426.165	55721.676	23.423	86.861	649.116	298.108	2.532	91.868	90.995	10.474
426.366	55724.789	23.483	87.117	649.22	297.951	2.569	92.58	91.723	10.567
426.566	56262.614	23.431	87.572	649.771	298.753	2.581	93.375	92.474	10.386
426.766	56311.588	23.468	88.006	649.382	298.38	2.598	94.131	93.258	10.494
426.967	56307.957	23.42	88.377	650.091	299.675	2.61	94.633	93.814	10.634
427.167	56864.727	23.539	88.739	651.018	299.641	2.626	95.44	94.554	10.527
427.369	56863.134	23.556	89.049	650.931	299.873	2.666	95.972	95.136	10.621
427.57	57050.645	23.48	89.338	651.5	299.909	2.672	96.501	95.536	10.728
427.769	57377.591	23.46	89.874	651.602	300.363	2.695	96.866	96.004	10.884
427.97	57379.588	23.558	90.127	652.017	300.325	2.722	97.336	96.439	10.478
428.169	57844.927	23.574	90.497	651.834	300.861	2.718	97.88	96.966	10.914
428.369	57847.934	23.521	90.967	651.927	300.62	2.739	98.214	97.26	10.841

428.569	57847.926	23.573	91.34	651.45	300.814	2.747	98.705	97.709	10.893
428.771	58261.25	23.494	91.638	651.086	301.139	2.776	98.757	97.718	11.066
428.971	58259.342	23.4	92.062	649.252	301.404	2.782	98.9	97.93	11.095
429.171	58508.983	23.466	92.35	648.98	301.692	2.789	98.991	97.979	10.814
429.372	58615.881	23.376	92.742	649.12	301.41	2.797	98.664	97.713	11.042
429.571	58615.744	23.418	92.971	648.443	301.399	2.795	98.459	97.518	10.836
429.773	58893.085	23.364	93.403	648.223	302.055	2.785	98.136	97.159	10.903
429.972	58891.671	23.356	93.748	647.518	302.579	2.798	97.907	96.949	10.654
430.172	58935.421	23.381	94.108	646.541	301.958	2.794	97.642	96.726	10.718
430.373	59062.671	23.354	94.386	646.186	301.962	2.772	97.463	96.531	10.799
430.572	59061.353	23.324	94.73	645.45	302.121	2.779	97.317	96.456	10.553
430.772	59161.015	23.384	95.022	645.167	302.345	2.778	97.147	96.209	10.804
430.972	59161.509	23.354	95.352	644.257	302.651	2.766	96.6	95.737	10.734
431.173	59167.484	23.417	95.688	644.168	302.998	2.776	95.964	94.976	10.649
431.374	59204.257	23.326	95.942	644.044	303.326	2.742	95.181	94.305	10.366
431.574	59207.273	23.396	96.23	643.478	303.444	2.717	94.388	93.537	10.311
431.775	59168.349	23.328	96.507	642.499	302.901	2.702	93.585	92.707	10.176
431.974	59144.351	23.434	96.684	641.079	302.875	2.68	92.656	91.862	9.907
432.175	59139.953	23.389	96.898	639.977	303.421	2.654	91.804	91.034	10.193
432.376	58978.145	23.379	97.217	638.55	303.093	2.631	91.099	90.32	10.007
432.576	58974.879	23.384	97.335	637.348	303.794	2.604	90.5	89.705	10.287
432.775	58955.441	23.451	97.651	637.035	303.307	2.582	90.222	89.374	10.141
432.975	58743.552	23.452	97.776	635.668	303.39	2.569	89.734	88.875	10.315
433.175	58741.15	23.363	98.059	635.085	303.555	2.547	89.44	88.575	9.978
433.377	58518.265	23.412	98.097	632.669	302.998	2.547	88.946	88.042	10.398
433.577	58485.834	23.346	98.366	631.166	303.235	2.537	88.534	87.718	10.162
433.777	58489.78	23.432	98.392	629.598	303.453	2.522	88.255	87.501	9.85
433.977	58238.368	23.412	98.736	629.01	302.866	2.524	88.126	87.296	10.021
434.177	58236.557	23.438	98.833	628.268	303.203	2.501	87.902	87.115	10.038
434.378	58140.663	23.412	99.197	628.904	303.087	2.519	87.64	86.898	9.865
434.578	58008.416	23.487	99.192	628.324	303.155	2.488	87.512	86.729	10.03
434.778	58003.516	23.4	99.3	628.42	303.492	2.488	87.362	86.587	10.092
434.979	57803.286	23.479	99.466	628.938	303.11	2.47	87.177	86.392	10.058
435.179	57797.804	23.39	99.725	629.151	303.279	2.461	87.123	86.337	9.946
435.38	57792.597	23.397	99.775	629.679	303.486	2.479	87.024	86.25	10.102
435.581	57620.003	23.374	99.913	629.969	303.317	2.465	86.917	86.187	10.088
435.78	57618.872	23.422	99.996	630.307	303.585	2.464	86.888	86.124	9.964
435.981	57514.083	23.535	100.242	630.58	303.049	2.472	86.869	86.068	9.962
436.181	57472.823	23.417	100.263	631.202	303.69	2.468	86.842	86.076	10.168
436.382	57475.515	23.449	100.59	632.074	304.148	2.465	86.797	86.053	10.167
436.582	57363.223	23.45	100.56	632.929	303.313	2.444	86.866	86.106	10.116
436.781	57358.049	23.374	100.766	633.247	303.73	2.435	86.906	86.201	10.075
436.981	57335.522	23.478	100.723	633.525	303.531	2.453	87.112	86.268	10.1
437.183	57276.344	23.375	100.935	634.387	303.586	2.446	87.203	86.414	10.019
437.382	57274.323	23.469	100.967	634.808	304.204	2.461	87.41	86.693	10.185

437.583	57238.205	23.487	101.039	635.516	304.067	2.467	87.631	86.891	10.014
437.785	57232.505	23.39	101.253	636.329	304.093	2.484	87.982	87.187	10.296
437.984	57236.645	23.424	101.475	636.565	304.321	2.488	88.275	87.44	10.25
438.184	57238.157	23.474	101.482	637.015	304.364	2.49	88.474	87.736	10.084
438.385	57238.27	23.452	101.616	637.457	304.916	2.495	88.757	87.971	10.409
438.585	57273.199	23.509	101.794	638.461	304.048	2.511	89.035	88.285	10.376
438.785	57289.039	23.398	101.978	639.895	305.2	2.502	89.218	88.372	10.195
438.986	57287.155	23.457	101.926	640.478	305.271	2.521	89.38	88.643	10.777
439.186	57372.352	23.549	102.166	640.482	305.362	2.525	89.494	88.747	10.552
439.385	57370.937	23.532	102.187	641.135	305.511	2.518	89.718	88.834	10.493
439.586	57382.596	23.422	102.418	641.167	305.288	2.529	89.787	88.959	10.525
439.785	57458.843	23.592	102.447	641.681	305.647	2.534	89.922	89.124	10.171
439.986	57452.455	23.522	102.643	641.96	305.884	2.528	90.031	89.225	10.515
440.186	57533.731	23.494	102.851	642.039	306.078	2.537	90.057	89.28	10.329
440.386	57537.135	23.557	102.888	641.421	306.548	2.534	90.112	89.36	10.349
440.587	57539.666	23.58	102.947	642.446	305.914	2.546	90.17	89.437	10.408
440.787	57617.731	23.616	103.161	642.399	306.73	2.552	90.209	89.439	10.453
440.988	57619.049	23.629	103.277	641.424	306.437	2.552	90.288	89.541	10.256
441.187	57653.647	23.547	103.475	642.194	307.11	2.551	90.375	89.607	10.167
441.388	57682.982	23.52	103.608	641.602	307.49	2.553	90.445	89.685	10.225
441.587	57680.896	23.526	103.735	642.185	307.514	2.557	90.409	89.686	10.501
441.787	57739.912	23.53	103.818	641.53	307.392	2.56	90.351	89.604	10.443
441.987	57743.186	23.617	103.942	641.015	308.02	2.567	90.444	89.718	10.168
442.187	57744.569	23.597	104.039	640.797	307.951	2.565	90.515	89.737	10.123
442.387	57789.298	23.52	104.109	641.346	308.98	2.566	90.528	89.814	10.381
442.587	57789.921	23.45	104.322	641.075	308.888	2.562	90.566	89.812	10.29
442.787	57825.125	23.46	104.362	640.947	308.481	2.576	90.608	89.812	10.365
442.988	57835.863	23.592	104.558	640.442	308.682	2.57	90.632	89.886	10.467
443.187	57834.318	23.531	104.638	641.165	309.021	2.583	90.748	89.914	10.228
443.389	57873.76	23.591	104.803	640.885	308.934	2.573	90.76	89.919	10.227
443.588	57873.557	23.563	104.849	640.548	309.165	2.569	90.777	90.056	9.946
443.788	57880.713	23.468	104.993	641.612	309.671	2.582	90.721	89.985	10.331
443.989	57910.848	23.544	105.096	641.489	309.61	2.565	90.955	90.09	10.264
444.189	57913.112	23.572	105.214	641.739	309.508	2.581	90.846	90.103	9.817
444.391	57944.896	23.536	105.336	640.768	309.597	2.566	90.98	90.126	10.141
444.591	57940.578	23.46	105.45	640.56	310.392	2.566	90.84	90.152	10.424
444.792	57943.481	23.584	105.481	640.738	310.239	2.564	90.93	90.166	10.117
444.992	57967.018	23.416	105.588	640.44	310.634	2.561	90.944	90.132	10.127
445.193	57966.808	23.547	105.672	640.16	310.564	2.564	90.897	90.163	9.905
445.394	57982.647	23.427	105.848	640.155	310.87	2.556	90.956	90.172	10.279
445.594	57987.385	23.457	105.899	639.613	311.281	2.563	91.028	90.201	10.026
445.793	57990.757	23.457	106.106	639.604	310.336	2.562	91.081	90.211	10.137
445.994	58020.124	23.518	106.047	639.353	311.195	2.551	91.2	90.4	10.256
446.194	58017.286	23.541	106.303	637.875	311.323	2.555	91.15	90.31	10.482
446.394	58020.908	23.57	106.259	636.946	311.648	2.576	91.139	90.324	10.426

446.594	58033.74	23.469	106.411	635.993	310.742	2.585	91.045	90.24	10.205
446.794	58038.51	23.555	106.407	636.085	310.61	2.575	91.064	90.26	9.945
446.995	58050.493	23.429	106.611	635.919	311.291	2.593	90.975	90.222	9.974
447.196	58053.735	23.529	106.62	635.936	311.467	2.567	90.979	90.236	10.437
447.396	58054.455	23.483	106.786	635.588	311.325	2.581	90.944	90.193	10.276
447.596	58065.451	23.561	106.79	635.602	310.933	2.571	90.97	90.189	10.312
447.796	58062.686	23.49	106.9	635.639	312.111	2.571	90.912	90.092	10.035
447.998	58064.845	23.524	106.937	635.624	311.262	2.576	90.873	90.088	10.288
448.197	58061.837	23.464	107.184	635.751	312.176	2.58	90.874	90.101	10.166
448.397	58061.869	23.446	107.222	635.919	311.35	2.569	90.846	90.074	10.366
448.599	58064.546	23.558	107.212	635.882	311.875	2.564	90.737	89.967	10.23
448.799	58065.581	23.568	107.286	636.203	311.698	2.567	90.794	90.052	10.103
448.998	58067.044	23.554	107.567	636.438	312.578	2.562	90.865	90.097	10.446
449.2	58067.367	23.628	107.56	636.554	312.446	2.57	90.891	90.12	9.997
449.399	58068.613	23.522	107.718	636.009	312.134	2.564	90.907	90.137	10.273
449.599	58069.769	23.631	107.754	636.718	312.094	2.575	90.808	90.079	10.382
449.799	58065.201	23.582	107.784	637.067	312.805	2.565	90.868	90.156	10.063
450	58070.189	23.566	107.961	637.668	312.947	2.559	90.891	90.155	9.853
450.201	58075.518	23.562	108.05	637.388	312.764	2.553	91.019	90.172	9.989
450.401	58075.243	23.648	108.046	637.882	313.091	2.577	90.961	90.252	10.103
450.601	58072.777	23.562	108.126	638.215	312.752	2.567	90.989	90.252	10.108
450.802	58082.326	23.605	108.296	639.188	313.314	2.566	91.031	90.225	10.398
451.003	58081.113	23.626	108.398	639.65	313.388	2.563	91.05	90.301	10.275
451.203	58088.083	23.643	108.44	640.021	313.092	2.572	91.083	90.318	9.952
451.403	58088.212	23.579	108.619	640.924	313.516	2.564	91.038	90.325	10.306
451.604	58089.74	23.664	108.545	640.756	313.417	2.578	91.09	90.366	9.955
451.804	58098.165	23.607	108.757	641.314	313.171	2.577	91.095	90.35	10.201
452.005	58101.302	23.608	108.819	641.735	313.812	2.577	91.281	90.436	9.956
452.205	58105.28	23.63	108.909	641.435	314.141	2.573	91.179	90.394	10.187
452.405	58109.436	23.705	108.846	640.93	314.239	2.577	91.138	90.409	10.138
452.605	58107.043	23.663	108.937	640.96	314.258	2.583	91.248	90.484	9.862
452.805	58119.446	23.733	109.024	641.626	314.127	2.584	91.156	90.463	10.216
453.005	58114.086	23.627	109.135	641.942	314.302	2.58	91.252	90.447	10.299
453.205	58121.266	23.704	109.118	642.689	314.421	2.594	91.103	90.371	10.057
453.405	58129.472	23.699	109.315	643.315	314.358	2.6	91.158	90.4	10.069
453.605	58129.804	23.707	109.389	643.752	314.627	2.581	91.151	90.413	10.288
453.805	58134.259	23.638	109.457	644.097	314.945	2.589	91.146	90.408	10.158
454.006	58134.461	23.718	109.466	644.858	315.109	2.585	91.257	90.478	10.406
454.205	58130.362	23.614	109.57	644.995	314.672	2.596	91.252	90.53	9.975
454.405	58140.606	23.699	109.735	644.744	314.942	2.565	91.198	90.534	10.345
454.605	58138.843	23.636	109.783	645.516	315.006	2.576	91.299	90.547	10.202
454.806	58146.63	23.674	109.848	645.585	315.124	2.58	91.214	90.457	10.234
455.005	58147.519	23.649	109.797	645.752	315.576	2.562	91.152	90.487	10.105
455.206	58147.495	23.619	110.021	646.084	314.859	2.555	91.24	90.487	10.588
455.405	58155.71	23.631	110.01	646.337	315.512	2.56	91.299	90.553	10.11

455.606	58161.41	23.722	110.138	646.673	315.239	2.578	91.195	90.495	10.329
455.806	58156.462	23.662	110.119	646.473	315.257	2.571	91.275	90.554	10.234
456.008	58170.636	23.761	110.246	646.746	315.585	2.57	91.295	90.561	10.32
456.209	58164.062	23.668	110.284	646.923	315.71	2.576	91.252	90.486	10.216
456.408	58177.46	23.686	110.512	647.3	315.444	2.575	91.281	90.569	10.09
456.608	58174.824	23.617	110.395	647.485	315.049	2.569	91.285	90.609	9.764
456.81	58180.136	23.677	110.514	647.407	315.816	2.609	91.266	90.572	10.068
457.011	58184.494	23.664	110.406	647.86	316.352	2.594	91.366	90.583	10.418
457.21	58183.694	23.629	110.57	648.048	316.411	2.587	91.365	90.634	10.005
457.41	58191.893	23.723	110.607	648.379	316.101	2.584	91.347	90.602	10.179
457.612	58196.946	23.702	110.676	647.852	316.345	2.591	91.348	90.638	10.334
457.811	58197.269	23.73	110.697	647.92	315.829	2.56	91.322	90.564	10.296
458.011	58207.579	23.647	110.914	648.258	316.07	2.578	91.306	90.571	10.187
458.212	58200.892	23.584	110.945	648.197	316.086	2.574	91.354	90.631	9.972
458.411	58202.913	23.6	111.029	648.602	316.889	2.558	91.241	90.562	10.129
458.612	58204.069	23.632	110.964	648.444	316.684	2.57	91.341	90.602	10.128
458.812	58207.91	23.681	111.088	648.548	316.617	2.567	91.284	90.627	10.137
459.012	58210.231	23.709	111.013	649.186	316.139	2.567	91.384	90.615	10
459.214	58213.077	23.629	111.225	649.601	316.39	2.574	91.404	90.683	10.259
459.414	58211.605	23.695	111.196	649.293	316.324	2.572	91.389	90.687	10.196
459.614	58223.24	23.632	111.304	649.762	317.176	2.578	91.383	90.644	10.264
459.813	58224.995	23.751	111.375	649.835	316.536	2.563	91.396	90.655	10.161
460.014	58223.564	23.631	111.433	649.681	316.845	2.593	91.414	90.662	10.381
460.214	58228.318	23.701	111.294	649.309	316.821	2.576	91.361	90.731	10.065
460.415	58229.232	23.663	111.561	649.99	317.422	2.57	91.693	90.847	10.171
460.615	58234.536	23.634	111.545	649.741	316.495	2.57	91.675	90.861	10.035
460.816	58236.67	23.667	111.723	648.79	316.299	2.562	91.848	91.05	10.099
461.016	58232.886	23.627	111.726	647.532	316.431	2.573	91.876	91.023	10.198
461.216	58250.133	23.616	111.666	646.93	316.212	2.559	91.893	91.03	10.232
461.416	58250.513	23.606	111.704	645.245	316.597	2.577	91.897	91.066	10.473
461.616	58269.457	23.659	111.878	644.109	316.678	2.573	91.917	91.122	10.191
461.818	58277.171	23.694	111.83	643.115	316.392	2.566	91.964	91.188	10.157
462.017	58278.933	23.717	111.904	642.197	316.358	2.576	91.71	90.938	10.139
462.217	58292.396	23.65	111.891	640.606	316.167	2.575	91.608	90.916	10.179
462.417	58292.371	23.685	111.948	639.25	316.195	2.581	91.615	90.839	10.25
462.617	58297.004	23.649	112.158	639.385	316.16	2.567	91.587	90.881	10.214
462.818	58297.886	23.633	112.174	639.059	316.524	2.548	91.792	91.011	10.341
463.018	58299.81	23.746	112.144	638.098	315.975	2.564	91.85	90.974	10.367
463.218	58304.54	23.668	112.28	637.432	316.223	2.584	91.795	90.989	10.358
463.418	58307.111	23.762	112.158	635.845	316.112	2.584	91.93	91.057	10.026
463.619	58307.071	23.726	112.368	635.979	316.084	2.58	91.915	91.039	10.337
463.819	58308.583	23.656	112.346	634.336	316.099	2.595	91.722	90.888	10.389
464.019	58313.353	23.64	112.49	633.042	315.63	2.588	91.616	90.924	9.978
464.219	58316.135	23.75	112.306	633.383	315.861	2.588	91.54	90.853	10.365
464.419	58318.763	23.675	112.551	633.349	315.646	2.578	91.619	90.85	9.919

464.62	58318.164	23.672	112.549	632.953	316.317	2.566	91.697	90.816	10.163
464.819	58317.032	23.678	112.555	633.19	315.96	2.573	91.793	90.94	10.146
465.02	58316.086	23.744	112.616	633.581	315.557	2.581	91.559	90.853	10.653
465.22	58315.116	23.669	112.723	633.002	315.866	2.592	91.582	90.829	10.414
465.422	58314.914	23.757	112.608	632.46	315.786	2.584	91.5	90.811	10.263
465.623	58313.2	23.643	112.732	632.188	315.826	2.583	91.464	90.799	10.147
465.822	58310.532	23.694	112.639	632.007	316.043	2.575	91.523	90.755	9.782
466.022	58306.594	23.616	112.7	631.678	315.979	2.565	91.57	90.77	10.613
466.223	58307.928	23.63	112.849	631.481	315.485	2.591	91.775	90.991	10.048
466.423	58305.648	23.606	112.905	630.821	315.997	2.597	91.802	90.938	10.077
466.622	58305.963	23.722	112.769	630.216	315.882	2.581	91.759	90.935	10.674
466.822	58310.92	23.671	113.001	629.613	315.989	2.598	91.814	91.084	10.39
467.022	58320.355	23.803	112.928	628.944	315.242	2.594	91.617	90.843	10.46
467.222	58318.286	23.683	112.97	628.153	316.216	2.6	91.636	90.823	10.608
467.422	58324.536	23.712	113.159	627.84	315.744	2.589	91.559	90.814	10.301
467.622	58322.239	23.65	113.173	627.415	315.818	2.587	91.495	90.833	10.327
467.823	58324.083	23.799	113.165	626.926	315.745	2.574	91.542	90.732	10.597
468.023	58314.534	23.647	113.166	626.563	315.973	2.577	91.542	90.784	10.189
468.223	58319.474	23.727	113.318	626.835	315.624	2.581	91.479	90.71	10.456
468.423	58307.985	23.618	113.239	626.78	315.893	2.591	91.433	90.629	10.222
468.624	58307.419	23.702	113.454	627.94	315.312	2.582	91.491	90.743	10.271
468.823	58308.906	23.738	113.319	627.213	316.092	2.577	91.652	90.781	10.045
469.025	58299.026	23.744	113.299	627.512	315.64	2.565	91.737	90.873	10.286
469.224	58296.35	23.627	113.441	627.652	315.783	2.562	91.729	90.95	10.293
469.424	58301.322	23.745	113.422	626.855	315.431	2.538	91.814	90.972	10.086
469.625	58301.104	23.695	113.396	626.514	315.761	2.543	91.745	90.942	10.229
469.825	58301.961	23.714	113.44	626.242	315.474	2.565	91.71	90.97	10.483
470.025	58312.795	23.699	113.571	625.376	315.463	2.568	91.826	91.036	10.491
470.225	58311.874	23.72	113.607	624.756	315.807	2.542	91.801	90.979	10.585
470.426	58311.785	23.664	113.631	623.74	315.389	2.553	91.742	90.89	10.34
470.626	58323.986	23.784	113.609	622.542	315.055	2.541	91.717	90.979	10.122
470.827	58320.905	23.654	113.729	622.459	315.266	2.527	92.149	91.38	10.027
471.027	58328.449	23.813	113.627	622.296	315.477	2.523	92.862	91.988	10.404
471.228	58331.093	23.702	113.793	622.867	315.328	2.534	93.782	92.89	10.237
471.427	58336.074	23.688	113.832	622.98	315.028	2.559	94.872	94.023	10.875
471.628	58435.704	23.83	113.8	622.935	315.824	2.589	96.164	95.391	10.628
471.828	58436.383	23.774	113.999	623.37	315.898	2.617	97.908	97.058	11.107
472.027	58459.604	23.694	114.01	624.204	315.714	2.664	99.52	98.736	10.959
472.228	58691.085	23.859	114.067	624.078	315.924	2.7	101.581	100.735	11.729
472.427	58689.12	23.74	114.06	625.081	315.953	2.764	103.667	102.752	11.595
472.627	59078.632	23.749	114.253	626.599	316.298	2.816	105.872	104.94	12.112
472.827	59132.482	23.753	114.171	627.569	316.692	2.896	107.991	107.141	12.288
473.027	59135.384	23.786	114.463	629.061	316.919	2.948	109.926	109.043	12.927
473.227	59753.418	23.792	114.481	629.793	317.449	3.021	112.183	111.312	13.144
473.427	59750.353	23.706	114.799	631.424	317.963	3.075	114.5	113.512	13.609

473.629	60128.125	23.677	114.944	633.851	317.496	3.163	116.782	115.714	13.539
473.829	60517.896	23.691	115.166	635.582	317.636	3.238	118.751	117.733	14.142
474.031	60517.653	23.74	115.37	637.645	318.27	3.305	120.559	119.472	13.868
474.231	61370.636	23.708	115.553	638.695	318.671	3.352	122.184	121.052	14.316
474.431	61367.782	23.674	115.958	639.489	318.825	3.422	123.532	122.26	14.207
474.633	61391.335	23.7	116.154	640.507	319.237	3.49	124.446	123.206	14.704
474.832	62240.703	23.708	116.455	640.736	319.595	3.528	125.33	124.144	14.594
475.032	62238.496	23.723	116.624	641.185	319.55	3.558	126.058	124.889	14.748
475.233	62843.091	23.582	117.008	642.194	319.994	3.557	126.779	125.603	14.758
475.433	63036.634	23.686	117.29	643.053	319.762	3.594	127.552	126.218	15.195
475.633	63029.13	23.611	117.58	643.813	320.494	3.622	128.03	126.817	15.467
475.834	63725.601	23.676	117.862	644.699	320.096	3.632	128.556	127.338	15.566
476.033	63720.71	23.572	118.134	645.875	320.824	3.655	129.071	127.816	15.537
476.233	63912.741	23.579	118.526	646.394	320.905	3.658	129.79	128.478	15.325
476.433	64321.723	23.676	118.751	646.988	321.17	3.687	130.011	128.78	15.496
476.635	64319.734	23.559	119.146	648.102	320.636	3.702	130.58	129.307	15.56
476.834	64823.381	23.576	119.477	649.647	321.141	3.731	130.918	129.71	15.495
477.034	64836.957	23.704	119.763	650.455	321.575	3.71	131.426	130.207	15.243
477.234	64834.871	23.664	120.095	652.138	321.612	3.746	132.066	130.853	15.766
477.434	65286.544	23.679	120.532	653.651	321.668	3.796	132.589	131.352	15.942
477.635	65286.577	23.555	120.781	655.237	321.108	3.8	132.873	131.753	16.048
477.835	65540.478	23.624	121.041	657.136	322.028	3.778	133.292	132.057	16.047
478.036	65682.711	23.515	121.397	659.187	322.221	3.804	133.824	132.59	16.279
478.235	65684.102	23.472	121.799	660.903	322.301	3.816	134.321	133.072	16.347
478.436	66036.986	23.557	122.086	662.621	322.21	3.815	134.916	133.766	16.556
478.636	66038.433	23.482	122.481	663.851	322.751	3.845	135.524	134.327	16.499
478.836	66091.555	23.549	122.69	664.411	322.173	3.855	136.284	134.974	16.582
479.037	66375.899	23.542	123.222	665.434	322.424	3.886	136.768	135.465	16.387
479.236	66373.481	23.527	123.352	666.634	322.4	3.893	137.481	136.07	16.303
479.436	66668.83	23.534	123.86	668.344	322.235	3.91	137.717	136.482	16.944
479.636	66693.41	23.533	124.167	669.813	322.421	3.923	138.012	136.741	16.807
479.836	66688.405	23.492	124.488	670.477	322.488	3.947	138.108	136.868	16.55
480.036	66986.008	23.543	124.782	672.428	322.303	3.956	138.327	137.169	16.839
480.238	66985.127	23.459	125.193	675.322	322.434	3.996	138.576	137.393	17.018
480.437	67101.462	23.477	125.378	677.481	322.87	3.99	138.873	137.654	16.777
480.637	67234.792	23.383	125.864	680.732	322.802	3.967	139.075	137.877	17.087
480.838	67239.061	23.488	126.107	682.918	323.4	3.991	139.377	138.175	16.913
481.04	67446.406	23.426	126.48	685.773	323.411	3.985	139.641	138.46	16.83
481.24	67452.939	23.547	126.727	688.651	323.136	3.978	139.92	138.778	17.199
481.439	67460.742	23.52	127.042	690.844	324.361	3.983	140.111	138.968	17.179
481.641	67645.787	23.449	127.467	694.202	323.972	4.017	139.648	138.454	16.942
481.841	67640.815	23.375	127.79	696.646	324.564	4.04	137.722	136.712	16.817
482.042	67741.043	23.483	128.068	697.836	323.718	3.93	136.335	135.231	16.112
482.243	67761.249	23.37	128.372	699.175	324.443	3.871	135.366	134.234	16.377
482.442	67763.294	23.361	128.534	700.33	324.523	3.836	134.533	133.191	16.236

482.642	67714.385	23.441	128.808	700.87	324.789	3.787	133.644	132.346	16.188
482.843	67713.932	23.385	128.98	700.577	324.949	3.791	132.798	131.493	16.417
483.043	67666.834	23.409	129.321	700.719	324.535	3.763	132.286	130.921	15.976
483.244	67572.541	23.339	129.425	699.666	324.306	3.755	131.969	130.654	15.807
483.443	67573.567	23.371	129.669	698.232	325.169	3.735	131.385	130.024	15.826
483.644	67391.166	23.354	129.866	696.788	325.111	3.741	131.28	129.822	16.094
483.843	67390.778	23.258	130.142	695.816	325.374	3.723	131.133	129.716	15.907
484.044	67391.829	23.283	130.297	694.062	325.005	3.716	130.791	129.452	15.997
484.245	67212.298	23.196	130.533	692.182	325.343	3.724	130.858	129.352	15.575
484.446	67209.767	23.259	130.531	691.036	325.332	3.713	130.465	129.139	15.665
484.645	67108.448	23.224	130.787	689.975	325.306	3.698	130.408	128.975	15.733
484.845	67061.317	23.315	130.945	688.398	325.781	3.695	130.39	129.001	15.829
485.045	67062.554	23.385	131.131	687.604	325.49	3.706	130.19	128.888	15.579
485.247	66927.372	23.393	131.266	686.88	325.692	3.699	130.107	128.806	15.491
485.447	66928.528	23.314	131.471	685.764	325.509	3.704	130.057	128.784	15.672
485.649	66902.129	23.29	131.571	684.702	326.116	3.708	130.029	128.699	15.478
485.848	66811.345	23.202	131.644	683.661	326.463	3.69	129.984	128.602	15.614
486.049	66809.033	23.221	131.81	683.558	326.27	3.684	129.976	128.549	15.732
486.25	66729.277	23.278	132.057	683.137	326.571	3.693	129.797	128.399	15.986
486.45	66723.205	23.193	132.031	681.873	326.586	3.688	129.819	128.421	15.576
486.649	66728.573	23.217	132.278	681.465	326.441	3.663	129.956	128.637	15.647
486.851	66647.031	23.231	132.302	680.563	326.579	3.663	130.201	128.868	15.804
487.051	66652.675	23.224	132.567	680.119	326.469	3.675	130.555	129.238	15.315
487.25	66625.58	23.161	132.566	680.485	327.416	3.7	130.752	129.507	16.05
487.451	66609.126	23.174	132.658	680.466	326.893	3.706	131.009	129.688	15.959
487.651	66609.838	23.205	132.77	680.179	326.99	3.708	131.132	129.938	16.042
487.851	66614.794	23.138	132.985	681.033	327.687	3.735	131.277	129.974	15.92
488.052	66616.969	23.237	132.973	681.37	327.654	3.726	131.483	130.191	15.906
488.252	66625.216	23.218	133.248	681.426	327.925	3.733	131.545	130.319	15.794
488.453	66648.163	23.148	133.313	682.245	328.405	3.737	131.558	130.217	15.733
488.652	66650.281	23.323	133.427	683.18	327.586	3.721	131.796	130.528	15.779
488.852	66681.96	23.242	133.49	683.516	328.43	3.713	131.795	130.562	15.747
489.053	66684.54	23.17	133.709	684.282	328.506	3.756	131.706	130.386	16.089
489.254	66682.251	23.194	133.667	684.46	328.885	3.738	131.75	130.409	15.947
489.455	66723.237	23.215	133.922	685.562	328.989	3.759	131.792	130.479	15.507
489.655	66720.868	23.158	134.118	686.065	328.727	3.731	131.684	130.355	15.829
489.855	66731.905	23.243	134.182	686.211	329.138	3.77	131.74	130.458	15.996
490.056	66744.065	23.262	134.231	686.985	328.771	3.754	131.666	130.419	15.922
490.256	66741.041	23.136	134.43	687.323	329.362	3.758	131.836	130.561	16.099
490.456	66753.348	23.094	134.503	686.826	329.8	3.748	131.822	130.48	16.214
490.656	66759.218	23.244	134.557	686.71	329.531	3.758	131.847	130.56	15.692
490.857	66752.911	23.101	134.668	686.557	329.081	3.752	132.094	130.807	16.006
491.057	66776.327	23.124	134.767	686.776	329.641	3.761	132.089	130.829	15.915
491.257	66778.461	23.082	134.771	686.946	329.538	3.749	132.236	131.061	16.037
491.459	66799.952	23.138	134.97	687.32	330.173	3.745	132.505	131.214	15.862

491.659	66806	23.245	135.126	688.158	330.464	3.777	132.627	131.368	15.951
491.858	66809.744	23.26	135.242	688.33	330.262	3.782	132.671	131.496	16.052
492.058	66854.586	23.165	135.427	689.785	330.352	3.788	132.863	131.667	16.062
492.259	66859.858	23.263	135.477	690.721	330.945	3.788	133.082	131.87	16.069
492.458	66874.186	23.177	135.674	692.021	330.647	3.77	133.14	132.07	16.307
492.659	66908.986	23.143	135.756	693.567	330.901	3.808	133.888	132.513	16.446
492.858	66909.447	23.275	135.796	695.301	331.152	3.802	133.832	132.582	16.695
493.059	66976.548	23.153	135.994	696.933	331.832	3.829	134.123	132.865	16.471
493.258	66978.659	23.295	136.049	697.807	331.661	3.82	134.073	132.942	16.346
493.459	66979.217	23.287	136.095	698.964	331.424	3.815	134.302	133.097	16.372
493.658	67055.39	23.226	136.377	699.904	331.598	3.822	134.576	133.419	16.371
493.859	67061.568	23.319	136.455	700.477	330.668	3.833	134.833	133.615	16.652
494.06	67107.049	23.273	136.455	701.189	331.997	3.86	135.174	133.99	16.598
494.26	67141.687	23.245	136.764	701.864	331.262	3.867	135.468	134.258	16.88
494.462	67137.806	23.2	136.754	701.812	332.505	3.87	135.728	134.486	16.761
494.661	67238.463	23.31	136.832	703.065	332.26	3.88	136.04	134.819	16.618
494.862	67233.943	23.196	136.955	704.758	332.452	3.887	136.13	134.997	16.804
495.061	67255.919	23.213	137.269	706.152	332.205	3.892	136.377	135.19	16.842
495.262	67340.381	23.354	137.257	707.068	332.283	3.907	136.534	135.311	16.794
495.461	67340.64	23.329	137.356	707.602	332.314	3.906	136.632	135.446	16.582
495.662	67429.006	23.305	137.431	708.695	332.321	3.918	136.689	135.559	16.421
495.863	67435.685	23.338	137.59	709.116	332.75	3.916	136.805	135.58	17.058
496.062	67435.159	23.228	137.837	710.62	332.763	3.9	137.172	135.864	17.317
496.263	67525.313	23.257	138.03	710.682	332.589	3.931	137.003	135.803	16.87
496.462	67527.059	23.346	138.003	711.021	332.442	3.922	136.984	135.773	16.724
496.662	67561.245	23.351	138.147	711.884	332.774	3.906	136.935	135.852	16.84
496.862	67596.87	23.266	138.272	712.863	332.646	3.898	137.011	135.829	16.803
497.062	67602.376	23.377	138.383	713.896	332.704	3.912	137.032	135.896	16.949
497.263	67657.73	23.302	138.624	714.68	333	3.913	136.987	136.065	16.977
497.463	67661.279	23.387	138.671	715.826	333.19	3.93	137.164	136.139	16.943
497.664	67658.021	23.312	138.717	717.676	333.343	3.94	137.186	135.988	16.735
497.864	67711.911	23.342	138.969	720.022	332.989	3.91	137.183	136.033	16.823
498.065	67707.65	23.256	138.904	721.281	333.689	3.921	137.102	135.929	16.859
498.265	67743.307	23.377	139.076	722.598	333.622	3.938	137.105	135.951	17.082
498.464	67746.452	23.305	139.2	724.373	333.924	3.911	137.158	135.955	17.066
498.664	67749.743	23.427	139.294	724.496	333.765	3.924	137.136	136.017	17.06
498.866	67777.606	23.328	139.299	724.959	334.462	3.942	137.102	135.993	16.734
499.066	67782.635	23.392	139.581	725.816	333.77	3.935	137.081	135.863	16.949
499.266	67790.146	23.435	139.592	726.084	334.354	3.907	137.152	136.024	17.003
499.466	67806.277	23.395	139.779	727.086	333.519	3.925	137.428	136.259	16.878
499.666	67802.129	23.25	139.937	727.178	334.249	3.954	137.202	136.022	16.955
499.868	67827.227	23.403	140.068	726.076	334.559	3.932	137.19	136.305	17.115
500.068	67824.728	23.257	140.154	727.113	334.825	3.94	137.368	136.275	17.394
500.269	67826.879	23.427	140.156	727.474	335.06	3.941	137.353	136.14	16.886
500.469	67846.696	23.334	140.13	728.66	334.506	3.95	137.337	136.07	16.798

500.67	67851.758	23.334	140.407	729.289	334.872	3.941	137.233	135.973	16.993
500.87	67855.372	23.296	140.47	730.035	334.867	3.93	137.197	136.013	16.836
501.069	67863.951	23.309	140.625	731.842	334.635	3.909	137.192	136.057	17.015
501.27	67860.644	23.3	140.622	732.28	334.928	3.922	137.111	135.961	16.827
501.472	67869.692	23.284	140.796	732.463	335.014	3.918	137.389	136.218	16.964
501.671	67870.945	23.32	140.838	732.298	334.985	3.922	137.522	136.321	17.081
501.871	67877.915	23.408	140.941	731.554	335.159	3.955	137.402	136.283	16.67
502.071	67884.804	23.4	140.938	729.995	334.933	3.966	137.32	136.093	16.721
502.273	67888.175	23.41	141.062	728.954	335.055	3.928	137.189	135.96	16.877
502.472	67895.307	23.288	141.227	728.808	335.214	3.931	137.268	136.019	16.812
502.672	67896.859	23.406	141.231	728.589	335.152	3.94	136.956	135.845	16.797
502.873	67894.264	23.245	141.447	728.18	335.548	3.914	137.011	135.85	16.82
503.072	67888.579	23.33	141.355	727.813	334.853	3.931	136.94	135.79	16.934
503.274	67891.822	23.338	141.635	728.17	335.37	3.921	136.918	135.754	16.518
503.473	67887.819	23.398	141.639	727.567	335.763	3.884	136.849	135.628	16.842
503.675	67879.605	23.281	141.757	728.13	335.462	3.892	136.808	135.649	16.855
503.874	67879.281	23.377	141.666	727.914	335.663	3.904	136.725	135.611	16.82
504.075	67869.611	23.256	141.955	728.285	335.697	3.87	137.011	136.068	16.959
504.275	67868.147	23.364	141.865	729.276	335.877	3.885	137.356	136.267	17.18
504.476	67871.543	23.371	142.052	731.767	335.708	3.944	137.288	136.082	16.97
504.675	67876.12	23.381	142.119	732.042	335.862	3.919	137.147	136.009	16.606
504.875	67876.346	23.268	142.248	732.786	335.657	3.904	137.253	136.017	16.648
505.075	67881.108	23.356	142.105	732.983	335.981	3.92	137.366	136.174	17.113
505.276	67883.874	23.31	142.403	732.257	336.111	3.934	137.436	136.165	17.179
505.475	67884.868	23.425	142.317	731.274	336.074	3.923	137.196	136.014	16.635
505.675	67894.474	23.306	142.499	730.727	335.846	3.928	137.139	135.862	16.786
505.875	67895.703	23.395	142.524	729.429	335.92	3.93	137.003	135.829	16.356
506.075	67889.542	23.324	142.629	728.765	335.961	3.912	136.971	135.66	17.03
506.275	67890.536	23.413	142.647	728.214	335.891	3.922	137.062	135.843	16.908
506.475	67891.975	23.303	142.848	727.983	335.786	3.902	137.278	135.996	17.007
506.676	67885.208	23.32	142.725	726.51	336.144	3.901	137.353	136.116	16.969
506.875	67884.229	23.266	142.909	725.856	336.022	3.934	137.467	136.205	16.864
507.075	67885.378	23.268	142.977	723.851	335.912	3.936	137.536	136.25	16.953
507.275	67892.404	23.272	142.954	721.869	336.028	3.92	137.83	136.457	16.949
507.476	67896.131	23.294	143.147	720.441	335.133	3.932	137.42	136.178	16.733
507.676	67905.818	23.271	143.169	719.685	335.629	3.931	137.315	136.07	16.609
507.876	67913.734	23.378	143.186	719.693	335.903	3.92	137.043	135.889	16.821
508.076	67912.408	23.303	143.189	719.744	335.339	3.931	137.135	135.884	16.476
508.275	67913.475	23.307	143.281	719.984	336.051	3.904	137.036	135.827	16.273
508.475	67914.194	23.255	143.406	720.395	336.032	3.917	136.927	135.719	16.668
508.676	67914.55	23.369	143.41	720.437	335.504	3.895	136.882	135.73	16.475
508.876	67902.414	23.298	143.565	721.705	335.858	3.91	136.827	135.944	17.064
509.076	67908.276	23.389	143.493	723.37	335.909	3.909	136.9	136.13	17.379
509.276	67902.398	23.318	143.568	725.475	336.016	3.915	137.453	136.258	16.996
509.477	67902.842	23.376	143.52	725.755	335.675	3.932	137.495	136.245	16.98

509.678	67906.651	23.371	143.779	725.49	335.936	3.938	137.59	136.362	16.88
509.878	67922.102	23.35	143.779	725.211	335.386	3.929	137.708	136.406	16.853
510.078	67919.612	23.302	143.864	723.719	335.417	3.943	137.513	136.272	17.226
510.279	67927.616	23.358	143.928	722.959	335.866	3.948	137.588	136.313	16.834
510.479	67936.47	23.333	143.973	721.961	335.428	3.94	137.544	136.321	16.899
510.679	67935.532	23.386	144.008	719.811	335.604	3.925	137.667	136.324	16.906
510.879	67948.412	23.371	144.104	718.86	335.166	3.935	137.579	136.321	17.039
511.079	67949.229	23.38	144.21	717.37	335.21	3.956	137.426	136.182	16.52
511.279	67953.539	23.456	144.272	716.823	335.102	3.939	137.069	135.92	16.679
511.48	67949.245	23.479	144.177	716.33	334.891	3.92	136.909	135.733	16.75
511.679	67949.504	23.425	144.424	716.194	335.206	3.935	136.862	135.635	16.606
511.879	67936.381	23.495	144.299	716.396	335.407	3.917	136.778	135.531	16.743
512.08	67935.233	23.508	144.338	716.675	334.932	3.916	136.531	135.313	16.821
512.28	67937.974	23.412	144.548	716.997	335.028	3.887	136.491	135.287	16.389
512.479	67907.467	23.45	144.593	717.341	335.493	3.894	136.434	135.172	16.897
512.679	67908.138	23.56	144.454	717.55	335.029	3.913	136.44	135.217	16.544
512.88	67893.981	23.498	144.6	717.474	335.018	3.915	136.502	135.241	16.647
513.079	67880.922	23.501	144.69	717.594	335.004	3.894	136.472	135.088	17.168
513.28	67879.936	23.487	144.736	717.292	334.807	3.902	136.439	135.161	16.681
513.48	67857.345	23.568	144.67	717.46	335.448	3.901	136.372	135.203	16.757
513.68	67856.868	23.457	144.915	717.035	335.122	3.872	136.313	135.141	16.897
513.881	67858.833	23.556	144.973	716.897	334.878	3.894	136.323	135.129	16.886
514.08	67844.085	23.569	144.839	716.684	334.983	3.866	136.379	135.243	16.816
514.28	67840.357	23.51	144.91	716.646	335.02	3.857	136.619	135.39	16.925
514.48	67839.557	23.648	144.904	716.3	335.723	3.869	136.74	135.445	16.919
514.681	67832.652	23.5	145.055	715.44	335.66	3.899	136.636	135.406	16.852
514.88	67834.827	23.621	145.011	714.915	335.454	3.878	136.726	135.519	16.792
515.08	67841.077	23.611	145.101	714.665	335.401	3.859	136.612	135.522	16.815
515.28	67842.767	23.588	145.282	714.149	334.692	3.881	136.6	135.372	16.847
515.48	67842.686	23.666	145.16	713.063	335.101	3.881	136.544	135.33	16.748
515.68	67849.308	23.68	145.187	712.707	335.23	3.889	136.602	135.431	16.644
515.88	67846.818	23.647	145.166	712.627	334.953	3.868	136.629	135.414	16.793
516.08	67850.254	23.638	145.319	712.147	335.14	3.887	136.636	135.477	16.463
516.281	67854.378	23.634	145.39	712.477	335.297	3.883	136.722	135.462	16.515
516.482	67853.941	23.6	145.541	712.396	335.087	3.886	136.72	135.459	16.783
516.682	67858.186	23.602	145.503	711.784	334.982	3.897	136.861	135.596	16.677
516.882	67860.442	23.624	145.639	713.258	334.874	3.891	136.747	135.496	16.773
517.083	67864.63	23.717	145.57	713.117	335.364	3.897	136.69	135.388	16.746
517.282	67870.702	23.641	145.646	713.052	335.104	3.916	136.381	135.244	16.915
517.483	67865.609	23.603	145.635	713.31	335.287	3.902	136.398	135.104	16.922
517.682	67864.153	23.632	145.816	713.937	335.117	3.893	136.306	135.009	17.016
517.883	67864.113	23.669	145.826	713.684	335.428	3.87	136.147	134.904	16.746
518.083	67857.62	23.592	145.846	713.962	335.397	3.858	136.181	135.283	17.064
518.284	67845.532	23.704	145.853	714.645	335.299	3.882	136.534	135.436	16.96
518.483	67841.667	23.645	145.713	717.01	334.964	3.909	136.466	135.212	16.98

518.684	67841.336	23.617	145.808	718.325	335.295	3.906	136.503	135.272	16.549
518.885	67845.184	23.643	146.022	718.825	334.986	3.888	136.547	135.281	17.394
519.087	67841.603	23.595	145.923	719.396	335.133	3.895	136.446	135.168	16.791
519.286	67844.093	23.701	145.925	719.46	335.375	3.892	136.35	135.124	16.835
519.486	67841.239	23.592	146.09	719.486	335.727	3.891	136.389	135.139	16.923
519.688	67838.142	23.622	146.037	719.787	335.514	3.887	136.149	134.863	16.871
519.887	67832.24	23.604	146.038	718.873	335.438	3.9	136.369	135.202	16.548
520.087	67834.406	23.584	146.234	718.915	335.723	3.905	136.33	135.253	16.51
520.288	67828.383	23.662	146.245	718.953	335.001	3.901	136.333	135.126	16.93
520.488	67829.086	23.678	146.274	718.809	335.711	3.907	136.437	135.201	16.719
520.689	67825.512	23.63	146.379	718.593	334.779	3.896	136.457	135.194	16.737
520.889	67828.407	23.628	146.356	718.075	335.069	3.916	136.496	135.183	16.888
521.088	67822.464	23.598	146.351	718.188	335.3	3.919	136.385	135.185	16.803
521.288	67826.782	23.61	146.402	717.669	334.984	3.906	136.521	135.249	16.699
521.488	67823.548	23.664	146.243	717.506	335.539	3.897	136.284	134.97	16.833
521.69	67825.706	23.704	146.379	716.994	334.969	3.902	136.337	135.068	17.328
521.89	67819.788	23.574	146.533	716.296	335.571	3.895	136.197	134.935	16.689
522.092	67825.108	23.743	146.496	715.284	335.805	3.905	136.162	134.904	16.696
522.292	67814.823	23.623	146.512	714.697	335.4	3.867	136.204	134.912	17.063
522.494	67806.042	23.597	146.632	714.298	335.603	3.896	136.198	134.898	16.937
522.693	67812.689	23.75	146.621	713.534	334.756	3.893	136.113	134.89	16.668
522.894	67803.625	23.763	146.615	713.365	335.168	3.925	136.105	134.865	17.104
523.095	67799.574	23.654	146.723	713.089	335.029	3.917	136.12	134.904	17.014
523.295	67801.442	23.776	146.598	712.502	334.964	3.905	136.337	135.007	16.759
523.494	67787.745	23.652	146.641	711.873	334.937	3.905	136.31	135.045	16.882
523.695	67789.815	23.613	146.815	711.819	335.222	3.909	136.259	134.998	16.789
523.895	67795.297	23.751	146.827	711.473	334.87	3.903	136.369	135.136	16.609
524.097	67793.736	23.792	146.779	711.492	335.125	3.915	136.36	135.103	16.896
524.296	67789.782	23.628	146.892	711.298	335.002	3.905	136.23	134.874	16.536
524.496	67792.289	23.733	147.019	710.645	334.941	3.903	136.121	134.846	16.659
524.698	67791.602	23.73	146.957	711.461	334.963	3.909	136.012	134.8	16.603
524.897	67790.009	23.786	146.914	711.187	335.557	3.893	136.071	134.843	16.497
525.097	67775.35	23.667	146.963	711.74	335.332	3.887	136.056	134.824	16.774
525.297	67776.741	23.732	146.943	712.038	335.457	3.904	136.157	134.942	16.649
525.498	67778.204	23.835	146.982	711.482	335.445	3.914	136.246	134.985	16.704
525.699	67777.323	23.804	147.029	711.7	335.397	3.913	136.214	134.995	16.534
525.9	67779.417	23.771	147.129	711.467	335.272	3.917	136.356	135.099	16.324
526.099	67773.118	23.743	147.111	711.705	335.386	3.909	136.209	134.977	16.577
526.3	67780.274	23.779	147.199	712.175	335.194	3.904	136.12	134.831	16.617
526.5	67778.236	23.827	147.148	712.069	335.174	3.894	136.106	134.86	16.769
526.701	67783.387	23.804	147.243	711.52	335.56	3.91	136.278	134.927	17.109
526.902	67775.342	23.7	147.131	711.184	335.395	3.899	136.043	134.786	16.748
527.104	67771.614	23.752	147.257	710.581	335.386	3.922	136.043	134.727	16.778
527.303	67768.437	23.694	147.25	709.611	335.183	3.909	135.969	134.679	16.728
527.504	67767.07	23.712	147.227	708.781	335.036	3.892	136.117	134.844	17.232

527.704	67756.082	23.738	147.234	708.564	335.796	3.925	135.991	134.804	16.602
527.905	67756.818	23.746	147.248	708.568	335.587	3.929	136.067	134.803	16.645
528.106	67750.802	23.623	147.361	708.329	335.859	3.923	136.014	134.825	16.633
528.305	67754.877	23.702	147.441	708.822	334.598	3.929	135.932	134.744	16.72
528.505	67747.519	23.615	147.379	708.608	335.291	3.956	135.972	134.657	16.73
528.705	67748.732	23.691	147.435	709.193	335.303	3.922	136.092	134.983	16.655
528.905	67751.093	23.672	147.48	709.449	335.027	3.892	136.714	135.561	16.617
529.105	67752.921	23.658	147.401	709.835	335.551	3.908	137.591	136.4	17.195
529.306	67756.017	23.57	147.557	710.647	335.881	3.905	139.44	138.313	17.13
529.506	67755.039	23.663	147.447	712.198	335.664	3.982	141.489	140.421	17.665
529.707	67888.305	23.62	147.713	713.916	335.657	4.041	144.523	143.391	18.419
529.909	67882.176	23.65	147.613	716.731	335.939	4.122	148.299	147.117	18.813
530.109	67892.323	23.563	147.745	719.364	336.037	4.227	152.627	151.402	19.397
530.309	68278.245	23.624	147.95	722.357	337.036	4.403	156.765	155.528	20.381
530.509	68274.962	23.679	147.985	725.673	337.194	4.491	160.278	159.056	20.865
530.71	68826.889	23.706	148.243	728.083	337.058	4.572	164.541	163.363	21.451
530.909	68985.882	23.602	148.606	731.142	337.681	4.724	168.73	167.327	22.14
531.109	68984.961	23.588	148.779	734.797	337.833	4.867	172.606	171.147	22.605
531.31	69953.655	23.576	149.105	738.128	338.199	5.052	175.941	174.583	23.448
531.51	69958.296	23.701	149.303	740.62	337.793	5.232	179.078	177.577	23.633
531.71	70290.579	23.61	149.66	743.515	338.71	5.297	181.518	179.983	23.882
531.91	71036.283	23.591	150.059	746.506	339.399	5.377	183.707	182.096	24.353
532.11	71037.075	23.558	150.549	749.365	339.586	5.508	185.427	183.733	24.485
532.312	72076.421	23.633	150.858	752.241	340.027	5.582	186.877	185.053	24.512
532.511	72089.94	23.634	151.346	755.201	339.912	5.608	187.88	186.047	24.684
532.712	72098.009	23.528	151.763	758.967	340.179	5.627	189.406	187.352	24.904
532.912	73011.787	23.587	152.17	761.441	340.947	5.671	190.292	188.244	25.074
533.112	73018.603	23.662	152.604	763.151	340.768	5.718	191.032	188.942	25.28
533.311	73518.11	23.47	153.199	764.279	340.678	5.75	191.465	189.449	25.416
533.512	73815.73	23.567	153.565	765.121	340.389	5.743	191.443	189.416	25.289
533.712	73813.369	23.468	154.148	765.746	340.604	5.784	191.494	189.46	25.545
533.913	74455.255	23.462	154.5	766.664	340.598	5.775	191.652	189.672	25.322
534.112	74454.924	23.55	154.869	768.138	341.497	5.769	192.296	190.252	25.634
534.314	74546.549	23.515	155.362	769.478	340.946	5.766	192.895	190.802	25.774
534.513	74961.158	23.435	155.87	770.045	340.887	5.834	192.917	190.931	25.631
534.713	74958.312	23.494	156.17	770	340.977	5.81	193.281	191.159	25.646
534.914	75368.669	23.399	156.735	771.609	341.219	5.813	193.487	191.496	25.711
535.114	75379.075	23.454	157.113	772.815	341.193	5.846	193.507	191.633	25.805
535.315	75375.38	23.383	157.545	774.081	341.821	5.866	193.935	192.102	25.852
535.514	75717.042	23.418	157.845	775.579	341.47	5.846	194.294	192.278	25.878
535.714	75715.247	23.411	158.395	777.457	342.445	5.856	194.442	192.561	26.06
535.916	75858.692	23.356	158.69	777.989	341.66	5.83	195.099	193.082	26.118
536.115	76003.124	23.44	159.097	779.137	342.523	5.859	195.521	193.443	26.186
536.315	75996.567	23.323	159.431	778.81	342.429	5.859	195.994	193.88	26.168
536.515	76246.903	23.321	159.936	778.975	342.452	5.884	196.012	193.924	26.454

536.715	76247.849	23.353	160.14	778.624	343.151	5.892	196.016	193.839	26.046
536.916	76263.268	23.466	160.693	778.144	342.534	5.921	196.156	194.138	26.278
537.117	76454.806	23.186	161.041	778.925	343.123	5.935	196.12	194.066	26.244
537.317	76457.894	23.468	161.307	779.068	343.261	5.924	196.131	194.101	26.234
537.517	76582.557	23.377	161.588	779.674	343.269	5.942	196.202	194.121	26.336
537.718	76617.397	23.345	162.024	780.5	343.596	5.932	196.452	194.411	26.465
537.917	76614.05	23.257	162.411	780.617	343.591	5.956	196.686	194.679	26.259
538.117	76747.906	23.327	162.596	780.65	344.117	5.974	196.554	194.543	26.411
538.317	76745.076	23.224	163.099	781.079	343.713	5.953	196.722	194.684	26.694
538.517	76786.07	23.295	163.326	780.444	343.562	5.965	196.715	194.707	26.55
538.717	76855.565	23.293	163.549	779.872	343.937	5.952	196.701	194.709	26.36
538.917	76855.217	23.258	164.024	780.169	344.485	5.972	196.827	194.794	26.454
539.119	76941.425	23.197	164.374	780.382	344.011	5.967	196.772	194.641	26.35
539.318	76944.999	23.26	164.634	779.567	344.097	5.957	196.688	194.559	26.409
539.519	76940.228	23.204	164.756	779.373	344.687	5.975	196.505	194.598	26.501
539.721	77011.486	23.236	165.073	778.92	344.805	5.962	196.723	194.773	26.527
539.921	77009.618	23.154	165.449	779.198	344.849	5.94	196.689	194.674	26.359
540.121	77053.029	23.227	165.669	778.641	345.332	5.961	196.576	194.555	26.383
540.321	77063.654	23.159	166.043	779.208	345.611	5.937	196.641	194.618	26.41
540.522	77066.209	23.282	166.253	778.78	345.609	5.934	196.7	194.49	26.288
540.721	77100.969	23.196	166.604	778.192	345.426	5.942	196.634	194.541	26.353
540.921	77100.936	23.227	166.758	777.809	345.657	5.967	196.367	194.287	26.489
541.121	77105.472	23.168	167.098	777.533	346.108	5.953	196.238	194.082	26.27
541.321	77127.004	23.327	167.4	777.137	345.991	5.928	196.395	194.257	26.318
541.522	77126.551	23.218	167.538	777.371	346.189	5.827	195.924	193.762	26.188
541.721	77132.874	23.123	167.868	777.227	345.827	5.852	196.088	193.772	26.093
541.922	77133.715	23.182	168.133	777.313	346.324	5.842	196.096	193.762	26.039
542.121	77130.57	23.186	168.211	777.652	347.328	5.851	196.155	193.972	26.039
542.321	77145.576	23.138	168.618	778.803	346.37	5.927	196.335	194.153	26.228
542.521	77146.361	23.203	168.588	779.323	346.106	5.938	196.468	194.333	26.37
542.721	77154.6	23.164	169.015	779.807	346.767	5.832	196.249	193.965	26.05
542.922	77160.122	23.135	169.072	779.824	346.783	5.836	196.249	193.802	26.094
543.122	77164.278	23.141	169.459	780.896	346.515	5.833	196.353	193.976	26.038
543.324	77172.445	23.163	169.504	781.027	347.277	5.822	196.272	194.049	26.251
543.523	77172.121	23.144	169.855	782.011	346.58	5.842	196.379	194.027	26.166
543.724	77170.213	23.135	170.025	782.388	346.825	5.944	196.508	194.23	26.398
543.926	77188.236	23.184	170.261	781.991	346.938	5.914	196.175	194.062	26.442
544.126	77186.319	23.219	170.432	782.088	347.13	5.907	195.925	193.809	26.144
544.325	77182.26	23.156	170.628	782.311	346.919	5.798	195.846	193.392	26.004
544.525	77183.845	23.13	170.918	782.272	347.361	5.83	196.15	193.8	25.993
544.725	77183.069	23.144	171.05	782.607	347.519	5.821	196.557	194.166	26.084
544.926	77184.71	23.112	171.165	782.771	347.574	5.85	196.66	194.173	25.92
545.125	77191.559	23.158	171.394	782.281	346.781	5.833	196.974	194.496	25.896
545.325	77200.081	23.059	171.659	782.521	347.261	5.851	197.186	194.674	26.407
545.526	77221.411	23.169	171.788	782.101	347.563	5.879	197.081	194.647	26.36

545.726	77223.278	23.177	172.005	781.912	346.391	5.877	196.911	194.502	26.25
545.925	77253.55	23.092	172.223	781.751	346.802	5.88	196.787	194.404	26.213
546.125	77252.96	23.118	172.403	781.264	346.958	5.955	196.751	194.519	26.528
546.326	77252.976	23.139	172.498	780.827	346.751	5.908	196.63	194.507	26.443
546.525	77263.002	23.129	172.48	781.264	346.914	5.902	196.257	194.229	26.547
546.727	77261.28	23.007	172.686	779.94	347.233	5.835	196.168	193.798	26.148
546.928	77256.979	23.16	172.838	779.924	346.861	5.853	196.08	193.756	26.126
547.127	77253.809	23.031	173.104	780.257	347.367	5.824	196.204	193.896	26.08
547.327	77250.89	23.04	173.132	780.22	346.966	5.822	196.077	193.814	26.201
547.528	77253.696	23.127	173.306	780.862	346.973	5.847	196.139	193.77	26.111
547.727	77252.241	23.07	173.557	781.911	347.309	5.882	196.184	193.986	26.186
547.927	77254.286	23.132	173.621	781.762	347.148	5.923	196.096	193.911	25.872
548.129	77241.762	23.045	173.737	783.095	347.212	5.915	196.482	194.235	26.247
548.329	77243.104	23.058	173.848	782.615	347.672	5.928	196.273	194.139	26.025
548.529	77242.635	23.153	174.07	783.593	347.597	5.955	195.845	193.692	26.16
548.729	77239.021	23.152	174.112	783.537	347.771	5.845	195.802	193.46	26.154
548.931	77241.43	23.085	174.439	784.005	347.483	5.808	195.883	193.516	26.018
549.13	77228.073	23.151	174.431	783.722	347.736	5.826	195.951	193.523	25.964
549.332	77225.219	23.121	174.491	784.299	348.106	5.844	195.798	193.526	25.885
549.531	77222.001	23.117	174.621	784.72	347.802	5.85	195.998	193.654	25.962
549.731	77219.373	23.121	174.836	785.406	348.158	5.847	195.9	193.614	26.023
549.931	77216.972	23.102	174.973	785.808	348.347	5.857	195.889	193.484	26.114
550.131	77215.759	23.063	175.18	785.55	348.441	5.919	196.186	193.957	26.13
550.331	77216.373	23.162	175.195	785.682	348.551	5.932	195.731	193.702	26.078
550.531	77216.317	23.067	175.402	786.48	348.423	5.935	195.559	193.486	26.038
550.731	77204.827	23.085	175.41	786.187	348.465	5.897	195.865	193.604	26.142
550.932	77204.261	23.141	175.474	786.952	348.969	5.9	196.047	193.813	25.947
551.133	77192.101	23.2	175.74	786.471	348.749	5.883	196.181	193.914	26.171
551.332	77195.092	23.18	175.996	786.962	349.054	5.885	196.237	193.938	26.093
551.533	77188.389	23.141	175.973	786.84	349.512	5.907	196.362	194.14	26.276
551.732	77194.979	23.174	176.149	787.24	348.906	5.93	195.896	193.77	26.052
551.934	77197.146	23.253	176.067	787.246	349.057	5.886	195.732	193.639	25.977
552.133	77197.332	23.183	176.328	787.995	348.751	5.882	195.993	193.68	26.004
552.334	77189.909	23.155	176.347	788.755	349.453	5.82	196.108	193.652	25.968
552.534	77188.244	23.1	176.386	789.055	349.581	5.847	196.042	193.7	26.012
552.734	77197.639	23.11	176.631	789.314	349.434	5.843	196.013	193.634	26.062
552.935	77202.393	23.166	176.61	788.809	349.085	5.828	195.873	193.543	26.077
553.134	77194.72	23.115	176.686	788.384	349.699	5.849	195.976	193.493	25.93
553.334	77209.937	23.154	176.83	788.35	349.646	5.852	196.038	193.616	25.757
553.534	77203.816	23.131	176.975	787.478	349.489	5.876	195.891	193.505	25.972
553.734	77213.737	23.191	177.077	787.871	348.855	5.837	195.985	193.56	25.894
553.936	77209.743	23.094	177.018	788.25	349.867	5.828	195.796	193.539	26.187
554.135	77214.069	23.063	177.305	788.561	349.365	5.813	195.848	193.459	25.867
554.336	77216.098	23.176	177.299	789.03	348.946	5.841	195.94	193.477	26.057
554.535	77220.521	23.174	177.452	789.384	349.044	5.842	195.685	193.521	25.839

554.735	77212.646	23.074	177.469	789.311	348.903	5.846	195.912	193.413	25.967
554.936	77218.969	23.144	177.624	788.606	349.664	5.859	195.716	193.409	25.935
555.136	77213.026	23.11	177.73	789.326	350.289	5.842	195.802	193.451	25.896
555.336	77217.489	23.195	177.816	788.793	349.578	5.848	195.787	193.421	26.02
555.538	77213.374	23.115	177.845	789.896	349.153	5.931	196.024	193.782	26.396
555.737	77218.67	23.157	178.038	789.482	349.151	5.895	195.862	193.593	26.213
555.938	77213.123	23.055	178.158	789.343	349.679	5.931	195.969	193.662	25.979
556.137	77216.511	23.21	178.132	789.54	349.612	5.85	195.619	193.244	25.863
556.337	77212.597	23.213	178.27	788.577	349.556	5.826	195.655	193.353	25.924
556.539	77205.725	23.281	178.32	789.079	349.787	5.856	195.506	193.106	25.899
556.738	77206.266	23.16	178.382	789.78	349.637	5.827	195.679	193.308	25.901
556.939	77201.811	23.214	178.503	789.597	349.605	5.839	195.771	193.377	25.836
557.138	77198.666	23.121	178.597	790.841	349.954	5.823	195.774	193.361	25.89
557.338	77196.709	23.129	178.682	791.482	349.784	5.853	195.746	193.361	25.762
557.538	77200.566	23.164	178.861	791.689	350.187	5.843	195.729	193.302	25.793
557.738	77199.442	23.166	178.799	792.418	349.703	5.86	195.649	193.291	25.839
557.939	77204.512	23.264	179.016	792.983	349.369	5.872	195.685	193.376	26.063
558.139	77203	23.27	178.923	792.409	349.98	5.86	195.75	193.356	25.963
558.339	77202.393	23.163	179.162	793.448	350.079	5.841	195.702	193.271	25.837
558.539	77198.965	23.11	179.207	793.506	349.77	5.846	195.654	193.184	26.062
558.739	77204.035	23.244	179.158	793.816	350.053	5.87	195.504	193.145	25.856
558.94	77196.976	23.143	179.243	794.052	349.954	5.831	195.524	193.174	25.936
559.14	77199.523	23.136	179.421	793.966	349.337	5.827	195.471	193.15	25.915
559.34	77197.477	23.132	179.301	793.95	349.915	5.841	195.457	193.097	25.808
559.54	77195.707	23.186	179.45	793.95	350.239	5.82	195.536	193.145	25.599
559.74	77191.284	23.164	179.545	794.272	350.226	5.844	195.346	193.033	25.729
559.94	77195.189	23.197	179.682	794.604	349.928	5.813	195.517	193.135	25.868
560.14	77186.78	23.155	179.728	794.832	349.713	5.811	195.443	193.168	25.844
560.341	77191.171	23.217	179.938	795.13	349.805	5.826	195.382	193.004	25.906
560.54	77188.195	23.127	179.889	795.754	350.119	5.903	195.363	193.201	26.163
560.74	77186.376	23.205	179.79	795.642	349.831	5.885	195.233	193.056	25.755
560.94	77187.969	23.164	179.892	795.182	349.84	5.889	195.109	192.892	25.883
561.14	77177.425	23.195	180.01	795.419	350.1	5.803	194.66	192.324	25.761
561.341	77170.633	23.093	180.088	795.629	350.837	5.809	195.036	192.679	25.785
561.542	77169.307	23.194	180.076	795.23	350.54	5.799	195.158	192.707	25.75
561.741	77154.495	23.087	180.191	795.291	350.755	5.812	195.214	192.951	25.798
561.943	77157.333	23.212	180.193	795.147	350.518	5.839	195.289	193.042	25.886
562.142	77153.541	23.032	180.305	794.537	350.681	5.838	195.397	192.995	25.837
562.342	77160.357	23.186	180.338	794.976	350.883	5.85	195.382	193.053	25.818
562.543	77153.864	23.132	180.509	794.737	351.232	5.838	195.511	193.122	25.825
562.743	77167.359	23.241	180.469	794.465	350.864	5.863	195.468	193.171	25.986
562.943	77162.799	23.112	180.545	794.505	350.777	5.85	195.591	193.211	25.848
563.144	77171.345	23.199	180.633	794.95	350.57	5.849	195.508	193.222	25.795
563.343	77169.388	23.234	180.603	795.658	350.806	5.844	195.563	193.17	25.719
563.544	77174.806	23.234	180.795	795.374	350.987	5.842	195.605	193.14	25.86

563.744	77172.525	23.14	180.757	795.781	351.001	5.854	195.568	193.175	25.817
563.944	77176.39	23.232	180.805	796.062	350.862	5.822	195.44	193.029	25.804
564.146	77176.641	23.248	180.842	796.387	350.834	5.838	195.453	193.067	25.801
564.345	77184.597	23.329	180.884	796.871	351.011	5.857	195.474	193.17	25.7
564.546	77180.231	23.18	181.058	797.029	351.499	5.836	195.523	193.172	25.716
564.746	77183.732	23.218	181.059	797.073	351.091	5.84	195.446	193.087	25.754
564.946	77188.187	23.166	181.195	797.548	350.678	5.825	195.587	193.255	25.684
565.147	77184.185	23.226	181.192	798.047	351.172	5.816	195.493	193.152	25.869
565.348	77191.106	23.333	181.19	797.905	350.816	5.831	195.608	193.167	25.779
565.547	77189.788	23.276	181.217	797.907	350.768	5.851	195.619	193.242	25.879
565.748	77192.658	23.196	181.427	797.632	350.805	5.829	195.709	193.307	25.644
565.95	77192.747	23.163	181.457	798.203	351.496	5.851	195.538	193.256	25.975
566.149	77198.027	23.249	181.578	798.414	350.671	5.839	195.496	193.184	25.748
566.349	77200.364	23.284	181.494	798.394	351.371	5.823	195.484	193.248	25.608
566.55	77196.968	23.181	181.651	798.162	350.949	5.838	195.378	193.13	25.786
566.75	77194.413	23.205	181.675	799.316	351.179	5.813	195.545	193.143	26.007
566.95	77204.302	23.3	181.671	798.881	351.278	5.806	195.479	193.078	25.673
567.15	77198.795	23.184	181.787	798.873	351.462	5.798	195.739	193.148	25.597
567.351	77203.938	23.272	181.725	798.838	350.601	5.796	195.781	193.309	25.872
567.55	77198.747	23.152	181.834	798.918	351.503	5.814	195.505	193.209	25.89
567.75	77202.66	23.211	181.883	798.783	351.78	5.799	195.695	193.203	25.775
567.951	77207.754	23.233	181.97	798.884	350.827	5.829	195.638	193.146	25.787
568.15	77206.671	23.216	181.859	799.148	351.339	5.821	195.622	193.159	25.808
568.351	77208.458	23.171	181.999	799.704	351.338	5.824	195.773	193.278	26.024
568.55	77211.19	23.295	181.923	799.273	351.059	5.822	195.547	193.219	25.868
568.75	77208.15	23.217	181.909	800.006	351.016	5.818	195.552	193.196	25.983
568.95	77218.29	23.32	181.976	799.621	351.264	5.822	195.512	193.11	25.825
569.15	77220.448	23.243	182.047	799.684	351.028	5.835	195.763	193.225	25.836
569.35	77212.686	23.145	182.052	799.984	351.218	5.804	195.61	193.197	25.848
569.55	77216.543	23.189	182.069	799.352	351.041	5.773	195.636	193.213	25.874
569.751	77224.37	23.216	182.217	799.465	351.549	5.824	195.464	193.073	25.854
569.951	77223.723	23.239	182.332	799.167	351.397	5.818	195.444	193.086	25.859
570.151	77220.246	23.204	182.188	798.935	351.081	5.815	195.408	193.161	26.017
570.351	77223.852	23.134	182.326	798.388	351.214	5.811	195.547	193.09	25.691
570.551	77227.329	23.208	182.334	798.491	351.285	5.826	195.495	193.215	25.965
570.751	77224.612	23.166	182.514	798.722	351.183	5.843	195.556	193.119	25.9
570.952	77227.313	23.261	182.439	798.519	350.896	5.816	195.643	193.151	25.801
571.152	77224.709	23.11	182.431	798.694	351.692	5.904	195.552	193.247	26.088
571.354	77228.356	23.215	182.535	798.209	350.74	5.873	194.942	192.838	26.001
571.553	77218.573	23.281	182.463	797.558	350.949	5.807	195.108	192.793	25.991
571.753	77213.972	23.153	182.542	797.483	351.593	5.804	195.154	192.853	25.843
571.954	77213.188	23.131	182.585	796.992	352.043	5.779	195.222	192.882	25.798
572.153	77206.088	23.243	182.575	797.148	351.074	5.794	195.413	192.961	25.801
572.353	77200.323	23.162	182.683	798.07	351.625	5.805	195.463	193.069	25.662
572.554	77205.846	23.275	182.577	797.648	351.727	5.82	195.651	193.233	25.835

572.754	77198.262	23.185	182.723	797.653	351.63	5.818	195.721	193.29	26.003
572.954	77202.668	23.329	182.707	798.057	351.44	5.827	195.675	193.324	25.861
573.154	77206.048	23.306	182.741	797.596	351.631	5.844	195.705	193.248	25.899
573.353	77207.972	23.274	182.835	797.515	351.423	5.818	195.651	193.312	25.728
573.553	77210.511	23.306	182.837	797.442	351.779	5.836	195.749	193.35	25.925
573.754	77212.67	23.281	182.763	797.899	351.772	5.837	195.788	193.268	26.011
573.954	77213.915	23.203	182.897	797.91	351.735	5.829	195.827	193.308	25.985
574.154	77220.974	23.307	182.931	797.707	352.021	5.84	195.617	193.367	26.114
574.355	77216.996	23.289	182.932	797.828	352.093	5.832	195.764	193.35	25.948
574.554	77218.807	23.312	182.939	797.657	351.866	5.858	195.752	193.26	25.957
574.853	77223.278	23.232	183.102	798.075	352.34	5.85	195.793	193.31	26.205
575.055	77224.709	23.338	183.055	797.249	352.19	5.831	195.723	193.26	26.184
575.254	77224.976	23.237	183.112	797.606	352.083	5.845	195.627	193.282	25.911
575.454	77225.146	23.223	183.162	797.467	352.293	5.837	195.506	193.159	26.046
575.656	77224.774	23.216	183.244	797.547	351.97	5.825	195.645	193.201	26.091
575.857	77218.475	23.188	183.219	796.985	352.025	5.819	195.607	193.243	26.059
576.058	77219.025	23.287	183.237	796.318	351.827	5.831	195.458	193.14	25.941
576.257	77220.667	23.306	183.316	796.358	351.547	5.831	195.565	193.126	26.074
576.458	77218.184	23.224	183.493	795.539	351.978	5.816	195.52	193.15	26.102
576.658	77213.026	23.159	183.432	795.683	351.936	5.83	195.558	193.221	26.061
576.859	77212.581	23.215	183.51	795.212	351.987	5.824	195.533	193.127	26.093
577.06	77213.01	23.227	183.564	795.123	352.192	5.823	195.543	193.062	26.063
577.26	77211.853	23.3	183.512	794.487	352.16	5.844	195.468	193.094	26.092
577.46	77207.633	23.329	183.492	794.529	352.334	5.829	195.561	193.146	25.896
577.66	77208.959	23.301	183.599	795.254	352.357	5.846	195.597	193.083	25.944
577.86	77201.027	23.183	183.54	795.073	352.63	5.822	195.459	193.107	26.121
578.061	77202.709	23.303	183.515	795.112	352.084	5.825	195.546	193.167	25.81
578.26	77199.604	23.223	183.624	795.656	352.594	5.839	195.528	193.063	26.142
578.46	77206.153	23.251	183.709	795.457	352.081	5.832	195.658	193.125	26.039
578.661	77203.347	23.198	183.755	795.76	351.992	5.861	195.466	193.017	25.991
578.86	77205.425	23.289	183.696	795.138	352.172	5.83	195.443	192.937	26.016
579.06	77202.684	23.29	183.68	795.513	352.253	5.846	195.535	193.169	25.957
579.26	77201.658	23.209	183.782	795.412	352.267	5.834	195.501	193.064	25.964
579.461	77199.693	23.253	183.742	795.181	352.227	5.831	195.512	193.167	25.825
579.66	77201.787	23.308	183.763	795.402	351.823	5.818	195.536	193.114	26.003
579.861	77203.105	23.278	183.814	794.945	351.808	5.828	195.522	193.103	25.832
580.06	77204.973	23.292	183.923	795.235	351.987	5.834	195.704	193.3	25.97
580.26	77197.833	23.194	183.884	795.448	351.943	5.836	195.706	193.335	25.933
580.461	77212.201	23.196	183.945	795.358	352.402	5.849	195.589	193.197	25.899
580.66	77211.296	23.238	183.964	795.439	351.725	5.833	195.603	193.169	25.941
580.861	77207.075	23.206	183.958	795.921	352.504	5.83	195.708	193.316	26.082
581.061	77214.352	23.268	184.042	795.882	351.966	5.824	195.708	193.181	25.924
581.26	77216.058	23.281	184.058	795.943	351.894	5.82	195.66	193.207	26.015
581.53	77211.562	23.224	183.958	795.893	352.047	5.82	195.403	193.01	26.044
581.729	77216.22	23.209	184.138	796.121	352.171	5.802	195.167	192.78	25.927

581.93	77220.262	23.289	184.054	796.043	351.704	5.8	194.783	192.4	25.824
582.13	77208.627	23.333	184.02	796.108	351.581	5.8	194.597	192.085	25.639
582.33	77208.466	23.34	184.045	796.268	352.287	5.755	194.388	191.834	25.813
582.529	77178.387	23.182	184.107	796.884	352.353	5.756	193.931	191.5	25.821
582.729	77175.291	23.222	184.229	796.845	351.902	5.709	193.654	191.219	25.762
582.929	77178.808	23.226	184.245	796.546	351.947	5.71	193.255	190.846	25.567
583.131	77119.864	23.16	184.152	796.354	352.36	5.735	192.962	190.434	25.313
583.33	77125.185	23.31	184.065	796.311	352.19	5.717	192.468	190.152	25.431
583.53	77094.306	23.178	184.013	796.398	352.005	5.694	192.202	189.703	25.228
583.732	77052.763	23.26	184.17	796.488	352.556	5.693	191.633	189.343	25.365
583.931	77048.033	23.183	184.117	796.687	352.524	5.713	190.255	188.02	25.142
584.132	76955.009	23.256	184.025	795.975	352.446	5.701	185.773	183.316	24.455
584.333	76954.087	23.216	184.172	794.963	352.058	5.606	178.041	175.616	23.062
584.534	76950.764	23.22	184.077	792.511	351.546	5.382	168.877	166.641	21.996
584.734	76546.593	23.342	183.927	788.287	351.258	5.119	160.362	158.202	20.539
584.934	76543.269	23.19	183.873	782.81	350.498	4.866	152.34	150.224	18.806
585.134	75750.508	23.231	183.598	775.105	349.923	4.618	144.465	142.551	17.37
585.335	75434.162	23.307	183.226	767.235	349.668	4.337	136.65	134.933	16.043
585.534	75435.205	23.249	182.927	759.204	348.411	4.093	129.893	127.974	15.59
585.734	73755.226	23.192	182.394	750.576	348.188	3.875	123.839	121.976	14.75
585.935	73760.24	23.285	182.035	742.481	347.034	3.709	117.384	115.865	13.682
586.135	73229.789	23.158	181.547	734.827	346.226	3.553	111.672	110.178	12.939
586.335	71715.062	23.293	180.987	726.345	345.34	3.4	106.396	104.914	12.214
586.536	71712.491	23.256	180.405	717.798	345.23	3.221	101.477	100.167	11.73
586.735	69479.277	23.329	179.75	709.267	344.382	3.08	96.92	95.775	11.352
586.936	69437.58	23.429	179.215	701.949	343.88	2.943	92.777	91.74	10.895
587.137	69432.058	23.329	178.582	693.941	342.518	2.821	88.862	87.822	10.713
587.338	67040.634	23.459	177.928	686.167	341.947	2.69	85.292	84.329	10.275
587.538	67033.495	23.404	177.265	679.195	340.933	2.581	82.074	81.029	9.809
587.738	65618.415	23.476	176.668	672.156	340.448	2.467	78.754	77.772	9.372
587.939	64620.798	23.446	175.885	665.318	339.526	2.348	75.546	74.687	9.031
588.138	64626.604	23.58	175.161	658.816	338.505	2.274	72.82	71.97	8.703
588.339	62274.694	23.567	174.353	652.359	338.245	2.168	70.276	69.504	8.58
588.54	62274.064	23.575	173.712	646.105	337.723	2.081	68.005	67.205	8.335
588.74	61915.697	23.552	173.016	639.978	337.275	2.02	65.972	65.19	8.167
588.941	60027.153	23.613	172.236	634.772	336.579	1.966	64.218	63.478	7.943
589.141	60024.25	23.688	171.397	629.098	335.778	1.907	62.656	61.92	7.831
589.341	58036.578	23.657	170.793	624.17	335.294	1.854	61.21	60.424	7.668
589.542	57920.664	23.766	169.899	619.997	335.29	1.814	59.944	59.165	7.46
589.742	57922.305	23.834	169.103	615.453	334.47	1.78	58.764	57.983	7.23
589.943	55996.948	23.897	168.352	612.275	334.039	1.75	57.721	57.01	7.21
590.142	55995.985	23.933	167.671	608.58	333.471	1.699	56.848	56.12	7.146
590.342	55203.822	23.859	166.86	605.891	333.234	1.673	55.98	55.327	7.085
590.544	54276.017	23.938	166.113	603.001	333.185	1.654	55.28	54.623	6.886
590.745	54275.596	24.01	165.291	601.183	332.911	1.633	54.535	53.924	6.842

590.945	52778.553	24.068	164.422	599.736	332.327	1.609	53.996	53.379	6.815
591.144	52777.535	24.083	163.717	598.53	332.893	1.574	53.454	52.861	6.7
591.345	52707.91	24.123	162.97	597.215	332.16	1.551	52.958	52.395	6.654
591.546	51493.521	24.086	162.303	597.178	332.471	1.537	52.579	51.992	6.641
591.745	51492.543	24.127	161.627	596.083	332.081	1.517	52.221	51.694	6.609
591.946	50623.915	24.102	160.82	595.885	332.343	1.521	51.914	51.373	6.417
592.147	50404.102	24.112	160.164	594.921	331.691	1.501	51.613	51.028	6.51
592.347	50404.975	24.222	159.373	594.485	332.191	1.508	51.31	50.815	6.523
592.548	49502.121	24.219	158.81	594.323	331.348	1.496	51.117	50.612	6.449
592.747	49503.229	24.307	158.169	594.394	332.326	1.482	50.893	50.431	6.463
592.947	49237.636	24.323	157.353	595.139	332.747	1.469	50.712	50.236	6.53
593.148	48747.467	24.247	156.808	595.262	332.189	1.469	50.595	50.075	6.413
593.348	48750.572	24.264	156.195	595.74	331.996	1.455	50.441	49.981	6.36
593.548	48140.333	24.353	155.44	595.244	331.909	1.447	50.306	49.849	6.35
593.748	48134.374	24.305	154.84	596.824	332.097	1.434	50.185	49.73	6.349
593.949	48134.487	24.371	154.195	596.522	332.073	1.44	50.15	49.663	6.199
594.148	47637.688	24.419	153.566	597.041	332.458	1.443	50.084	49.654	6.272
594.349	47639.208	24.374	153.131	598.273	331.789	1.432	50.003	49.535	6.222
594.549	47370.583	24.419	152.498	598.932	332.099	1.447	49.939	49.502	6.213
594.75	47238.773	24.401	151.907	599.791	332.269	1.442	49.903	49.456	6.267
594.951	47234.172	24.419	151.321	600.725	332.561	1.428	49.921	49.432	6.099
595.151	46925.823	24.53	150.668	601.474	332.56	1.423	49.849	49.433	6.274
595.35	46925.354	24.521	150.167	601.858	332.545	1.42	49.883	49.419	5.992
595.55	46867.841	24.586	149.522	603.249	332.478	1.429	49.901	49.455	6.18
595.752	46679.473	24.547	149.127	604.272	332.709	1.429	49.951	49.508	6.101
595.951	46678.284	24.606	148.508	605.496	332.449	1.423	49.953	49.504	5.886
596.151	46506.782	24.547	148.019	606.412	332.402	1.419	50.023	49.575	5.982
596.351	46496.069	24.561	147.504	607.468	332.741	1.419	50.035	49.584	6.069
596.552	46491.986	24.569	146.961	607.713	332.739	1.44	50.097	49.648	6.029
596.752	46363.927	24.677	146.341	608.852	332.694	1.445	50.085	49.686	6.158
596.951	46361.453	24.619	145.872	610.261	333.314	1.425	50.151	49.71	6.102
597.151	46318.575	24.619	145.457	610.912	333.175	1.428	50.197	49.725	6.062
597.352	46268.413	24.637	145.035	611.907	333.9	1.427	50.309	49.827	6.061
597.553	46267.054	24.623	144.495	612.296	333.169	1.429	50.361	49.952	6.146
597.752	46212.089	24.653	144.022	613.154	333.188	1.414	50.396	49.934	6.05
597.952	46211.766	24.73	143.429	614.434	333.647	1.388	50.44	49.98	6.001
598.152	46205.702	24.637	142.963	614.573	333.573	1.403	50.47	50.04	6.067
598.353	46177.265	24.646	142.62	615.325	333.219	1.426	50.525	50.098	6.114
598.553	46180.701	24.725	142.135	615.812	332.869	1.424	50.554	50.117	6.016
598.753	46164.457	24.742	141.609	616.748	333.681	1.433	50.602	50.167	6.196
598.953	46159.46	24.735	141.352	617.72	333.808	1.458	49.781	49.368	6.243
599.153	46159.654	24.803	140.857	617.847	332.818	1.652	38.657	37.917	4.798
599.354	46036.69	24.772	140.255	614.899	332.723	1.446	34.574	33.915	4.338
599.553	46038.153	24.679	139.762	608.957	331.668	1.281	30.953	30.355	3.798
599.753	45662.524	24.711	139.261	600.957	330.202	1.187	27.829	27.328	3.333

599.953	44772.389	24.66	138.898	592.012	328.624	1.082	25.063	24.642	3.022
600.154	44774.992	24.735	138.394	582.589	327.147	0.971	22.902	22.434	2.704
600.354	42688.216	24.743	137.831	573.497	325.494	0.879	20.935	20.56	2.363
600.553	42657.313	24.7	137.471	564.535	324.411	0.775	19.121	18.784	2.171
600.753	42654.677	24.645	136.994	555.796	323.734	0.741	17.638	17.339	1.959
600.953	40129.665	24.643	136.486	547.057	322.628	0.693	16.262	16.003	1.795
601.153	40128.873	24.758	135.895	538.583	320.883	0.66	15.074	14.824	1.65
601.353	38733.724	24.68	135.452	530.737	320.124	0.612	13.957	13.75	1.49
601.553	37470.191	24.796	134.974	522.869	318.494	0.563	12.952	12.741	1.358
601.753	37465.186	24.778	134.452	515.198	317.609	0.535	12.085	11.889	1.285
601.953	34840.754	24.859	134.006	508.074	316.101	0.498	11.313	11.132	1.153
602.154	34831.319	24.829	133.535	501.216	314.73	0.447	10.578	10.428	1.079
602.353	34730.516	24.814	133.244	494.586	313.242	0.43	9.94	9.797	0.995
602.554	32310.778	24.804	132.69	488.15	312.632	0.409	9.366	9.247	0.956
602.755	32312.395	24.913	132.237	481.429	310.94	0.4	8.862	8.731	0.882
602.956	30437.492	24.89	131.766	476.047	310.445	0.376	8.382	8.264	0.821
603.157	29962.532	24.97	131.432	469.556	309.455	0.36	7.909	7.81	0.758
603.358	29955.748	24.917	130.985	464.038	308.875	0.341	7.474	7.394	0.703
603.558	27787.591	24.942	130.529	459.004	307.049	0.322	7.097	7.008	0.646
603.759	27787.607	25.006	130.205	453.629	306.412	0.314	6.759	6.664	0.615
603.958	27074.416	25.12	129.775	448.309	305.452	0.307	6.391	6.331	0.583
604.158	25813.883	25.06	129.412	443.599	304.658	0.278	6.079	6.005	0.55
604.358	25811.109	25.069	128.954	438.433	303.661	0.273	5.791	5.752	0.523
604.559	24041.997	25.041	128.583	433.519	303.285	0.263	5.536	5.47	0.482
604.759	24022.252	25.164	128.238	429.014	301.781	0.243	5.276	5.219	0.452
604.959	24020.74	25.229	127.729	424.479	301.25	0.244	5.022	4.979	0.429
605.158	22396.148	25.166	127.49	420.867	300.394	0.219	4.831	4.775	0.409
605.359	22392.364	25.215	126.998	415.631	299.03	0.218	4.608	4.553	0.381
605.559	21593.927	25.307	126.733	412.268	298.279	0.206	4.391	4.362	0.362
605.76	20929.693	25.247	126.325	408.128	297.468	0.197	4.224	4.205	0.346
605.961	20930.93	25.276	125.95	404.163	297.282	0.191	4.053	4.043	0.333
606.161	19615.246	25.379	125.568	400.392	295.991	0.179	3.906	3.869	0.31
606.361	19613.855	25.388	125.38	397.036	295.403	0.177	3.76	3.738	0.298
606.562	19509.843	25.463	125.009	393.332	294.104	0.171	3.607	3.596	0.289
606.762	18420.836	25.541	124.659	389.67	293.723	0.169	3.461	3.444	0.277
606.962	18415.726	25.487	124.353	386.579	293.096	0.162	3.337	3.337	0.259
607.162	17563.787	25.51	123.981	382.814	292.691	0.158	3.224	3.204	0.253
607.361	17347.984	25.522	123.705	379.782	291.75	0.154	3.098	3.106	0.242
607.561	17351.211	25.58	123.496	376.406	290.492	0.151	2.99	2.988	0.231
607.761	16377.196	25.676	123.095	373.485	290.755	0.141	2.88	2.885	0.216
607.961	16377.867	25.651	122.93	371.019	289.961	0.136	2.787	2.782	0.205
608.162	16162.048	25.701	122.549	368.12	288.928	0.135	2.703	2.699	0.21
608.361	15497.192	25.734	122.406	364.847	288.616	0.131	2.605	2.618	0.194
608.561	15500.006	25.813	122.02	362.32	287.641	0.126	2.513	2.518	0.181
608.762	14711.012	25.8	121.673	358.978	287.282	0.122	2.434	2.451	0.179

608.961	14695.715	25.842	121.507	356.443	286.768	0.121	2.357	2.364	0.176
609.162	14692.78	25.933	121.113	353.658	285.932	0.113	2.28	2.298	0.173
609.362	13965.883	25.844	120.86	351.165	285.476	0.113	2.209	2.229	0.165
609.563	13967.783	25.888	120.67	348.698	284.504	0.109	2.153	2.167	0.162
609.762	13648.259	25.948	120.41	346.286	283.783	0.103	2.066	2.102	0.156
609.962	13299.992	25.97	119.985	344.623	283.818	0.098	2.014	2.036	0.154
610.163	13299.79	26.008	119.78	341.41	282.75	0.096	1.962	1.983	0.149
610.362	12688.75	26.063	119.493	338.85	282.183	0.096	1.895	1.945	0.148
610.563	12686.034	26.038	119.3	336.898	281.756	0.095	1.861	1.879	0.137
610.763	12685.726	26.135	119.128	334.515	281.204	0.09	1.81	1.835	0.133
610.962	12128.028	26.249	118.788	332.439	280.939	0.089	1.758	1.78	0.131
611.162	12127.656	26.27	118.573	330.136	279.897	0.086	1.696	1.728	0.135
611.363	11792.616	26.297	118.335	327.787	279.349	0.087	1.651	1.689	0.124
611.563	11609.325	26.27	118.115	325.894	279.172	0.084	1.62	1.667	0.125
611.763	11608.848	26.316	117.881	323.437	279.003	0.082	1.57	1.612	0.12
611.963	11131.932	26.313	117.776	322.031	278.107	0.081	1.532	1.577	0.114
612.164	11132.781	26.388	117.534	319.901	277.34	0.08	1.487	1.53	0.116
612.364	11106.438	26.376	117.293	317.457	276.786	0.078	1.456	1.508	0.11
612.563	10690.438	26.509	117	315.89	275.941	0.076	1.412	1.451	0.111
612.764	10686.161	26.458	116.835	314.244	276.192	0.075	1.383	1.43	0.108
612.964	10369.944	26.516	116.539	311.997	275.797	0.074	1.349	1.392	0.102
613.165	10275.739	26.465	116.449	310.425	274.902	0.071	1.321	1.35	0.109
613.365	10277.923	26.564	116.226	308.754	274.504	0.071	1.28	1.314	0.105
613.565	9892.833	26.568	115.988	307.012	273.92	0.069	1.25	1.289	0.1
613.766	9894.531	26.595	115.824	305.005	273.882	0.068	1.23	1.275	0.101
613.967	9836.437	26.709	115.574	303.397	272.984	0.067	1.203	1.246	0.099
614.167	9533.173	26.647	115.397	301.886	272.717	0.065	1.186	1.222	0.1
614.368	9535.283	26.701	115.232	299.422	272.196	0.063	1.153	1.196	0.092
614.567	9237.995	26.748	114.905	298.274	272.102	0.064	1.103	1.169	0.095
614.768	9196.549	26.766	114.719	296.58	271.723	0.062	1.088	1.152	0.093
614.968	9198.748	26.806	114.645	295.488	271.077	0.061	1.07	1.119	0.096
615.169	8880.979	26.791	114.358	293.649	270.293	0.06	1.054	1.099	0.087
615.369	8883.752	26.977	114.2	292.502	269.563	0.058	1.023	1.064	0.086
615.569	8782.731	26.984	114.005	290.242	268.855	0.058	1.007	1.051	0.087
615.77	8586.714	26.913	113.801	289.216	269.756	0.057	0.975	1.027	0.083
615.97	8590.442	27.009	113.688	287.443	268.771	0.056	0.963	1.015	0.086
616.169	8317.806	26.983	113.529	285.929	268.524	0.056	0.943	0.991	0.085
616.37	8311.637	27.053	113.329	284.579	267.613	0.055	0.931	0.97	0.08
616.569	8311.046	27.156	113.086	283.02	267.662	0.053	0.902	0.949	0.082
616.771	8050.215	27.177	112.954	281.654	267.504	0.053	0.882	0.936	0.083
616.97	8048.995	27.18	112.812	280.55	266.823	0.051	0.88	0.906	0.078
617.171	7936.444	27.3	112.523	278.986	266.373	0.051	0.846	0.892	0.079
617.373	7801.537	27.215	112.529	277.203	266.22	0.05	0.843	0.886	0.077
617.572	7799.354	27.268	112.23	276.48	265.765	0.05	0.824	0.873	0.077
617.773	7567.882	27.349	111.982	274.707	265.546	0.049	0.792	0.853	0.074

617.975	7570.825	27.448	111.921	273.642	265.279	0.049	0.773	0.835	0.075
618.175	7567.72	27.394	111.8	272.891	264.925	0.049	0.762	0.831	0.071
618.374	7348.036	27.453	111.482	271.729	264.562	0.047	0.751	0.81	0.074
618.575	7347.349	27.478	111.326	269.927	263.97	0.046	0.739	0.795	0.076
618.776	7214.472	27.548	111.214	269.21	263.067	0.046	0.725	0.775	0.072
618.977	7138.759	27.485	111.093	267.871	262.836	0.045	0.721	0.769	0.073
619.177	7137.441	27.543	110.818	266.237	262.744	0.045	0.694	0.768	0.069
619.377	6938.691	27.558	110.776	265.304	262.178	0.044	0.696	0.752	0.068
619.579	6939.071	27.583	110.622	264.295	261.948	0.044	0.687	0.738	0.072
619.778	6935.982	27.643	110.46	262.519	261.859	0.043	0.665	0.735	0.069
619.978	6749.95	27.715	110.301	261.988	260.362	0.042	0.658	0.714	0.069
620.18	6749.95	27.8	110.014	261.159	260.951	0.041	0.641	0.698	0.07
620.38	6622.789	27.787	109.946	259.538	260.687	0.041	0.614	0.692	0.066
620.58	6565.56	27.849	109.702	258.103	260.257	0.041	0.609	0.679	0.066
620.781	6567.258	27.887	109.587	257.411	259.722	0.041	0.605	0.666	0.067
620.981	6392.643	27.88	109.405	256.635	259.38	0.04	0.589	0.651	0.066
621.181	6393.621	27.86	109.373	255.864	258.995	0.04	0.592	0.657	0.067
621.38	6384.129	27.901	109.252	254.265	258.239	0.039	0.586	0.642	0.065
621.58	6228.749	28.042	109.019	253.168	258.509	0.039	0.579	0.629	0.064
621.78	6227.739	28.067	108.806	251.93	257.628	0.038	0.551	0.617	0.064
621.981	6125.716	28.057	108.672	251.713	258.054	0.039	0.545	0.614	0.062
622.18	6070.491	28.041	108.64	250.771	257.23	0.038	0.544	0.613	0.062
622.38	6067.993	28.098	108.387	249.256	257.128	0.038	0.534	0.601	0.063
622.58	5915.613	28.134	108.371	248.236	256.437	0.039	0.533	0.601	0.059
622.78	5916.284	28.222	108.151	247.247	256.758	0.038	0.514	0.574	0.061
622.981	5908.522	28.157	108.092	246.586	256.278	0.037	0.519	0.568	0.062
623.181	5769.435	28.184	107.913	245.535	256.244	0.037	0.502	0.578	0.059
623.382	5770.769	28.292	107.671	245.092	255.758	0.037	0.487	0.545	0.057
623.581	5690.245	28.4	107.58	243.734	254.95	0.036	0.481	0.548	0.059
623.782	5631.528	28.423	107.43	242.743	255.429	0.035	0.478	0.545	0.059
623.982	5627.672	28.384	107.371	242.09	255.313	0.036	0.471	0.552	0.059
624.181	5493.08	28.476	107.167	241.103	254.508	0.035	0.463	0.533	0.057
624.381	5491.034	28.458	107.028	240.179	253.778	0.034	0.464	0.528	0.058
624.581	5493.072	28.571	106.978	239.565	253.575	0.034	0.458	0.532	0.058
624.781	5369.097	28.595	106.868	238.615	253.518	0.034	0.448	0.512	0.056
624.981	5366.315	28.531	106.749	237.5	252.634	0.034	0.441	0.508	0.054
625.181	5289.131	28.63	106.657	237.192	252.813	0.034	0.44	0.483	0.056
625.381	5242.623	28.696	106.456	236.004	252.83	0.033	0.414	0.481	0.053
625.581	5241.434	28.724	106.267	235.61	252.404	0.033	0.425	0.488	0.055
625.781	5120.111	28.696	106.159	234.596	252.192	0.033	0.411	0.487	0.054
625.981	5123.467	28.772	106.047	233.13	251.564	0.032	0.414	0.484	0.052
626.182	5120.75	28.755	106.013	232.804	251.422	0.032	0.413	0.46	0.051
626.382	5007.092	28.841	105.768	231.945	251.086	0.032	0.405	0.474	0.05
626.583	5006.655	28.857	105.641	230.911	250.979	0.032	0.392	0.456	0.051
626.785	4922.258	28.825	105.653	230.562	250.598	0.032	0.402	0.459	0.051

626.985	4894.307	28.833	105.402	229.814	250.436	0.031	0.378	0.45	0.053
627.185	4894.282	28.84	105.349	229.615	249.865	0.031	0.38	0.454	0.052
627.385	4790.214	28.994	105.16	227.877	249.442	0.031	0.371	0.436	0.049
627.584	4788.629	28.952	105.018	227.924	249.457	0.031	0.367	0.436	0.049
627.784	4775.498	28.957	105.016	227.472	249.215	0.031	0.375	0.417	0.051
627.984	4687.212	29.018	104.837	226.487	249.134	0.03	0.365	0.439	0.048
628.185	4690.746	29.104	104.712	225.566	248.71	0.03	0.341	0.422	0.049
628.385	4609.882	29.155	104.593	224.673	248.31	0.03	0.342	0.422	0.051
628.585	4587.89	29.053	104.489	224.768	248.593	0.03	0.339	0.412	0.05
628.786	4590.509	29.217	104.382	222.891	247.675	0.029	0.323	0.416	0.047
628.986	4490.685	29.217	104.217	222.534	247.765	0.029	0.331	0.409	0.05
629.186	4490.144	29.123	104.176	222.021	247.581	0.029	0.336	0.404	0.051
629.387	4467.011	29.139	104.134	221.122	246.369	0.029	0.329	0.399	0.048
629.587	4398.818	29.193	104.015	221.338	246.09	0.029	0.311	0.392	0.048
629.787	4400.467	29.317	103.789	220.144	246.229	0.029	0.299	0.392	0.048
629.988	4320.76	29.321	103.66	219.207	246.549	0.028	0.304	0.385	0.047
630.188	4310.023	29.292	103.658	218.542	245.771	0.028	0.299	0.386	0.045
630.387	4314.502	29.421	103.56	218.076	245.43	0.028	0.302	0.37	0.047
630.587	4220.572	29.334	103.394	217.508	245.65	0.028	0.306	0.379	0.048
630.788	4220.799	29.359	103.253	217.073	245.261	0.028	0.288	0.379	0.046
630.988	4207.118	29.406	103.189	216.548	245.758	0.028	0.284	0.369	0.046
631.188	4136.515	29.515	103.006	216.031	245.072	0.027	0.286	0.359	0.047
631.389	4137.235	29.547	102.931	215.613	244.663	0.028	0.285	0.364	0.046
631.588	4068.848	29.524	102.897	214.845	244.584	0.027	0.284	0.359	0.046
631.789	4048.731	29.535	102.724	213.814	244.289	0.027	0.277	0.362	0.043
631.988	4052.717	29.605	102.792	213.987	243.355	0.027	0.278	0.359	0.045
632.188	3970.738	29.608	102.602	213.537	243.943	0.027	0.276	0.362	0.044
632.388	3969.97	29.613	102.559	212.861	243.395	0.027	0.273	0.337	0.043
632.588	3969.913	29.683	102.482	211.909	243.435	0.026	0.271	0.33	0.044
632.79	3893.198	29.774	102.269	211.186	242.973	0.026	0.26	0.339	0.043
632.989	3896.448	29.817	102.296	211.034	243.115	0.026	0.264	0.321	0.044
633.19	3844.539	29.771	102.193	209.765	242.894	0.026	0.266	0.318	0.043
633.389	3819.28	29.838	102.085	209.637	241.926	0.026	0.26	0.332	0.043
633.589	3815.633	29.805	101.943	209.115	241.812	0.026	0.248	0.317	0.043
633.789	3743.478	29.923	101.809	209.185	241.584	0.026	0.245	0.322	0.044
633.99	3746.615	29.946	101.85	208.179	241.686	0.026	0.249	0.314	0.043
634.191	3742.516	29.944	101.685	207.809	241.868	0.025	0.238	0.318	0.042
634.392	3673.401	30.046	101.589	207.465	241.244	0.025	0.238	0.301	0.041
634.591	3668.655	30.011	101.413	206.406	240.795	0.025	0.24	0.325	0.042
634.792	3637.647	30.008	101.337	206.12	241.236	0.025	0.234	0.318	0.042
634.991	3602.555	30.081	101.382	206.146	239.791	0.025	0.229	0.302	0.039
635.192	3598.205	30.047	101.2	205.194	240.65	0.025	0.233	0.305	0.04
635.392	3534.783	30.104	101.194	204.768	240.371	0.025	0.227	0.305	0.039
635.592	3531.209	30.09	101.061	204.949	240.041	0.025	0.223	0.304	0.042
635.792	3529.317	30.108	100.888	204.391	240.035	0.024	0.214	0.311	0.039

635.992	3466.363	30.151	100.945	203.614	240.019	0.025	0.226	0.292	0.04
636.192	3465.021	30.243	100.643	202.997	239.613	0.024	0.216	0.29	0.04
636.392	3448.809	30.12	100.651	202.766	239.137	0.024	0.203	0.296	0.041
636.592	3397.66	30.299	100.46	201.752	238.242	0.024	0.206	0.281	0.041
636.792	3396.197	30.298	100.393	201.129	238.292	0.024	0.207	0.289	0.041

Fuel Flow (L/hr)	Thrust (N)
0.009	0.045
0.009	0.966
0.01	1.016
0.009	1.147
0.009	1.087
0.01	0.544
0.01	1.301
0.01	1.136
0.009	0.939
0.01	1.125
0.009	0.253
0.009	0.418
0.01	0.966
0.009	0.391
0.009	1.06
0.009	1.41
0.01	1.12
0.009	0.939
0.009	0.944
0.009	0.094
0.009	1.213
0.009	0.237
0.009	1.142
0.009	0.144
0.009	0.703
0.009	0.796
0.009	1.268
0.01	0.593
0.01	0.665
0.009	1.038
0.01	1.136
0.01	0.747
0.01	0.9
0.01	0.928
0.01	0.199
0.009	0.462
0.009	0.966
0.009	0.182
0.009	1.01
0.01	0.55
0.009	0.983
0.009	1.268
0.009	-0.322
0.009	1.153

0.009	1.038
0.01	0.725
0.009	0.023
0.009	0.188
0.009	0.785
0.009	0.868
0.009	0.21
0.009	0.253
0.009	1.219
0.009	-0.026
0.009	0.714
0.009	0.517
0.009	1.197
0.01	0.654
0.009	0.709
0.009	0.237
0.009	-0.202
0.009	1.142
0.009	0.149
0.009	-0.174
0.009	0.676
0.009	0.253
0.009	0.868
0.009	-0.021
0.009	-0.114
0.009	0.89
0.009	0.078
0.009	1.12
0.009	0.796
0.009	0.928
0.009	-0.289
0.009	0.544
0.009	-0.3
0.009	0.95
0.009	-0.032
0.009	0.111
0.01	0.38
0.009	0.994
0.009	0.116
0.009	0.741
0.01	-0.037
0.01	-0.202
0.01	0.27
0.009	0.385
0.01	0.555

0.01	-0.191
0.009	0.621
0.01	0.61
0.009	0.785
0.01	0.528
0.009	-0.081
0.01	0.966
0.01	0.44
0.009	1.317
0.009	1.081
0.009	1.29
0.009	0.983
0.009	1.109
0.01	0.61
0.009	1.043
0.01	-0.081
0.009	-0.109
0.01	0.127
0.01	-0.081
0.01	0.434
0.01	-0.109
0.009	-0.004
0.01	0.577
0.009	0.188
0.01	1.06
0.009	1.054
0.01	1.389
0.009	0.319
0.01	1.202
0.01	0.632
0.009	1.389
0.009	0.089
0.009	0.451
0.009	1.114
0.009	1.169
0.01	0.347
0.01	0.242
0.01	0.061
0.01	0.484
0.009	0.632
0.01	-0.207
0.009	-0.284
0.01	0.561
0.01	0.089
0.009	0.884

0.01	0.391
0.009	0.204
0.01	-0.174
0.009	0.698
0.009	1.548
0.009	0.029
0.009	1.498
0.01	0.714
0.009	1.443
0.009	1.421
0.009	0.33
0.009	1.213
0.009	1.087
0.01	1.811
0.009	0.632
0.009	1.871
0.01	1.306
0.009	1.548
0.009	1.213
0.009	1.197
0.01	1.01
0.009	1.652
0.009	1.109
0.009	1.251
38.145	-0.333
38.162	-0.41
38.165	-0.503
38.165	-0.125
38.166	-0.964
38.165	-1.024
38.165	0.193
38.165	-0.531
38.165	-0.492
38.166	-0.054
38.165	0.884
38.166	2.951
38.166	3.248
38.166	2.946
38.166	4.279
38.166	2.546
38.167	4.569
38.166	3.368
38.166	4.953
30.678	4.986
30.49	5.364

30.491	5.315
30.489	6.417
30.489	7.805
10.036	7.081
-0.208	7.13
-0.211	7.317
-0.211	8.868
-0.211	8.83
-0.212	10.546
38.139	12.241
38.164	12.356
38.165	13.146
38.165	14.517
38.166	15.147
38.166	16.102
38.166	16.727
38.166	17.999
38.166	18.421
38.166	19.375
38.166	21.07
38.165	21.92
38.166	21.936
36.715	22.764
18.378	23.839
18.374	24.64
18.399	25.572
18.412	25.336
18.412	26.351
18.411	27.091
18.411	27.162
18.411	26.795
20.493	27.442
20.493	25.896
21.847	26.296
23.483	24.53
23.483	26.488
23.372	23.971
23.371	24.93
23.371	23.631
16.331	25.199
16.329	23.022
16.558	23.927
17.123	23.006
17.123	23.483
16.235	23.302

16.138	23.291
16.138	23.082
15.648	23.444
15.647	22.353
15.605	23.51
15.306	22.567
15.306	23.17
13.06	22.112
12.319	23.856
12.319	22.008
12.281	22.803
12.28	22.775
12.311	22.995
12.507	23.104
12.507	22.337
12.436	22.677
12.394	22.945
12.393	22.112
12.167	23.346
12.166	23.093
12.166	23.565
12.281	22.391
12.28	23.455
12.262	23.784
12.243	23.132
12.242	23.187
12.092	22.989
12.091	22.348
12.091	23.609
12.053	23.576
12.052	22.836
12.018	22.123
11.939	23.357
11.939	22.479
12.144	23.417
12.167	22.814
12.166	23.258
12.318	22.825
12.318	23.181
12.341	23.176
12.507	22.94
12.507	23.647
12.335	21.717
12.28	22.545
12.28	23.285

11.487	22.463
11.485	23.219
11.489	22.868
11.712	22.293
11.712	22.737
11.903	22.43
12.015	23.587
12.015	22.567
12.052	23.718
12.052	22.616
12.052	23.488
12.204	22.413
12.204	22.764
12.12	23.477
12.015	23.378
12.015	23.378
12.128	22.764
12.129	23.768
12.128	22.781
12.432	22.649
12.431	23.653
12.486	22.49
12.621	23.055
12.621	23.274
12.053	23.565
11.977	22.528
11.976	23.801
11.901	23.916
11.901	23.735
11.925	23.581
12.128	23.121
12.128	23.34
11.889	23.614
11.787	23.258
11.788	22.249
12.09	23.428
12.091	23.291
12.078	23.461
11.826	23.307
11.825	22.474
12.073	23.066
12.28	22.737
12.28	23.949
12.016	23.505
12.015	23.521

12.015	23.143
11.826	23.028
11.826	23.225
12.012	23.905
12.204	23.318
12.204	24.174
11.84	23.406
11.826	24.256
11.826	23.773
11.901	24.13
11.901	23.318
11.938	22.989
12.091	23.28
12.09	24.344
12.059	23.477
12.052	24.102
12.052	23.45
12.053	24.185
12.053	23.57
12.063	23.302
12.204	23.691
12.204	23.006
12.153	23.658
12.129	23.702
12.129	23.894
12.317	23.357
12.318	24.486
12.318	22.879
12.431	24.283
12.431	23.439
12.373	24.261
12.318	23.708
12.318	24.519
12.205	23.285
12.204	23.411
12.204	23.335
11.901	23.543
11.901	23.34
12.005	23.313
12.166	23.609
12.166	24.25
12.237	23.74
12.242	23.62
12.243	23.219
12.204	24.272

12.204	23.439
12.171	23.751
11.977	24.662
11.976	23.675
12.124	24.453
12.166	24.009
12.166	23.06
11.863	23.669
11.863	24.102
11.852	23.093
11.637	24.81
11.637	23.477
11.493	24.892
11.408	24.228
11.409	24.497
11.862	23.559
11.863	24.415
11.863	24.004
12.204	24.009
12.204	23.411
12.034	24.283
11.826	23.071
11.826	24.706
12.161	23.565
12.166	24.574
12.167	23.653
12.166	24.124
12.166	23.499
12.134	23.581
12.053	23.976
12.052	24.228
12.35	23.954
12.356	24.015
12.356	23.927
12.204	24.585
12.204	24.448
12.075	23.313
11.674	24.327
11.674	24.316
12.187	24.958
12.281	24.497
12.28	24.711
12.393	24.124
12.393	24.722
12.389	24.042

12.053	25.117
12.053	23.79
12.095	24.727
12.129	24.492
12.128	24.481
12.053	24.08
12.053	24.53
12.053	24.854
11.75	25.089
11.75	24.168
11.707	23.702
11.637	24.163
11.637	25.232
11.673	24.355
11.674	24.519
11.674	23.581
11.862	24.217
11.863	24.93
11.863	23.823
11.863	24.695
11.863	24.568
11.685	24.168
11.674	24.289
11.674	24.996
11.863	23.916
11.862	24.788
11.873	23.762
12.015	24.601
12.015	24.256
12.188	25.457
12.28	24.272
12.28	24.958
12.318	24.579
12.318	26.471
12.318	25.83
12.243	26.17
12.242	26.362
12.078	27.113
11.901	27.426
11.901	27.667
12.014	28.243
12.015	28.308
12.015	27.853
12.469	29.087
12.469	27.963

12.482	29.153
12.507	28.55
12.507	28.868
12.686	29.531
12.696	29.416
12.696	30.71
13.075	30.047
13.075	30.979
13.121	30.847
13.34	31.769
13.34	32.613
13.606	33.107
13.678	32.569
13.679	33.134
13.793	32.772
13.793	33.31
13.802	34.231
14.208	35.24
14.209	34.5
14.231	35.657
14.247	35.563
14.247	35.679
14.472	35.892
14.473	36.803
14.473	37.044
14.813	37.9
14.813	36.786
14.974	37.22
15.191	37.73
15.191	37.943
14.822	37.932
14.813	39.106
14.814	40.455
15.153	39.896
15.154	39.627
15.11	40.164
15.041	41.294
15.04	41.108
15.263	41.76
15.306	41.069
15.306	41.343
15.608	42.117
15.608	41.848
15.588	41.771
15.457	42.698

15.457	42.934
15.43	42.308
15.419	43.01
15.419	42.627
15.418	42.446
15.419	41.941
15.419	42.067
15.419	42.999
15.419	42.599
15.369	42.396
15.267	41.782
15.267	42.04
15.156	41.848
15.154	41.788
15.153	41.129
14.852	41.628
14.851	40.384
14.841	40.389
14.776	39.298
14.776	40.279
14.519	39.227
14.435	39.621
14.435	39.32
14.36	39.446
14.36	38.322
14.359	38.815
14.058	38.563
14.058	38.81
13.984	38.135
13.944	38.695
13.944	38.508
13.756	37.872
13.755	38.76
13.755	38.261
14.208	37.921
14.208	38.13
14.196	37.724
14.171	38.437
14.17	38.338
14.424	38.459
14.434	38.777
14.434	37.971
14.625	37.296
14.624	38.843
14.617	38.042

14.586	38.706
14.586	38.711
14.552	39.106
14.549	38.135
14.548	37.993
14.663	39.117
14.662	39.133
14.663	38.799
14.663	39.227
14.663	39.292
14.662	38.771
14.662	39.364
14.662	38.437
14.361	39.654
14.359	38.574
14.36	38.76
14.133	39.462
14.134	39.506
14.26	39.419
14.397	39.972
14.397	39.183
14.613	39.649
14.625	39.599
14.625	39.386
14.398	38.667
14.397	39.484
14.373	38.859
14.247	39.709
14.246	38.777
14.53	39.89
14.625	39.309
14.624	39.216
14.625	39.698
14.625	39.956
14.618	39.484
14.548	39.501
14.549	39.545
14.389	39.27
14.322	38.261
14.322	39.654
14.322	38.651
14.322	39.715
14.322	39.808
14.548	39.929
14.549	38.919

14.671	39.276
14.889	38.667
14.888	38.919
14.814	38.558
14.813	39.797
14.814	39.007
14.322	38.793
14.322	38.212
14.352	39.249
14.473	38.941
14.473	38.799
14.473	38.739
14.473	39.704
14.473	38.59
14.473	40.356
14.473	39.561
14.473	38.985
14.548	40.016
14.549	39.907
14.401	39.205
14.322	38.618
14.323	40.077
14.322	39.874
14.323	38.865
14.322	39.731
14.246	39.117
14.246	39.627
14.233	39.956
14.208	39.561
14.209	39.155
14.171	39.249
14.171	39.013
14.17	38.832
14.36	38.881
14.359	40.186
14.347	40.022
14.246	40.164
14.247	39.506
14.442	39.117
14.511	40.334
14.511	39.599
14.662	39.813
14.663	39.281
14.662	39.572
14.511	39.249

14.511	40.077
14.572	39.068
14.625	40.225
14.625	39.375
14.136	40.636
14.133	39.72
14.133	40.285
14.283	39.254
14.283	39.687
14.259	39.287
14.209	39.775
14.209	39.265
14.278	40.46
14.283	39.594
14.284	40.438
14.133	39.024
14.133	40.532
14.195	39.331
14.586	39.885
14.587	39.188
14.45	40.011
14.398	40.268
14.397	39.846
14.586	39.002
14.586	40.4
14.586	39.682
14.7	40.219
14.7	39.397
14.562	39.709
14.435	39.627
14.435	40.252
14.473	39.528
14.473	40.296
14.473	38.87
14.36	39.232
14.36	40.268
14.348	40.082
14.323	39.654
14.322	40.153
14.562	39.528
14.586	40.159
14.587	38.865
14.435	40.17
14.436	39.205
14.439	40.115

14.473	40.12
14.473	40.449
14.158	39.539
14.095	40.389
14.095	39.369
14.058	40.192
14.058	39.166
14.058	39.144
14.057	39.972
14.057	39.627
14.132	39.205
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14.171	39.111
14.283	39.484
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14.549	40.071
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14.283	40.071
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14.171	39.254
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14.625	43.307
14.919	44.858
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14.927	45.686
15.646	46.394
15.646	46.86

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16.214	49.882
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16.971	53.627
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15.797	52.064
15.608	51.39
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16.251	53.43
16.178	53.441
16.175	52.596
16.175	53.534
16.441	52.771
16.441	52.744
16.602	52.563
16.97	53.676
16.971	53.578
16.94	53.824
16.933	53.567
16.933	53.737
16.819	54.082
16.819	54.636
16.82	53.819
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16.857	53.665
16.856	54.406
16.857	54.543
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17.009	53.956
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16.932	54.126
17.233	54.406
17.235	53.994
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16.82	54.422
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16.933	54.817
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16.819	54.296

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16.744	54.131
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17.237	53.961
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17.122	54.861
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17.178	54.592
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17.047	53.6

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16.782	54.071
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16.706	53.698
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16.707	54.433
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16.82	55.168
16.819	54.757
16.71	54.768
16.63	53.638
16.63	54.044
16.63	54.587
16.631	54.674
16.631	55.157
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17.085	54.921
17.065	54.334
16.933	54.356
16.933	53.786
16.908	54.455
16.895	53.802
16.895	53.66

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16.782	53.923
16.781	54.652
16.668	54.888
16.668	53.797
16.688	54.587
16.744	55.042
16.745	54.329
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17.729	58.211
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17.729	61.195
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21.706	74.328
21.705	74.646
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22.839	76.412
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22.85	76.132
22.954	77.174
22.955	76.659
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22.879	77.257
22.878	77.476
22.879	78.359
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22.879	77.975
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22.993	79.401
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22.954	82.543
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23.068	81.468
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22.803	81.589
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21.596	69.113
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14.872	57.466
12.319	54.011
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10.954	36.907
10.954	35.322
10.885	34.911
10.841	34.302
10.841	33.984
11.331	33.326
11.333	33.874
11.333	32.767
11.031	33.31
11.03	32.366

10.838	31.429
10.538	31.845
10.538	30.99
10.795	31.303
10.803	31.286
10.802	30.233
10.954	29.882
10.954	29.411
11.001	30.485
11.143	30.518
11.144	28.934
10.985	29.454
10.954	29.553
10.954	28.868
10.575	28.615
10.576	28.857
10.593	28.78
10.878	29.685
10.878	29.164
11.103	29.361
11.219	29.142
11.219	29.816
10.804	29.537
10.803	28.873
10.803	29.63
10.766	29.131
10.765	29.444
10.932	29.762
11.106	28.934
11.107	28.857
11.031	28.369
11.03	29.444
11.031	29.016
10.954	28.912
10.954	29.125
10.955	28.983
10.954	28.21
10.954	28.961
11.135	29.087
11.144	28.775
11.144	29.005
10.841	26.97
10.841	24.185
10.841	23.686
-0.183	21.295

-0.21	21.415
-0.211	20.083
-0.211	18.882
-0.211	18.75
-0.211	18.163
-0.212	16.979
-0.211	16.381
-0.211	15.756
-0.211	16.052
-0.212	15.186
-0.212	15.021
-0.211	14.1
-0.212	15.509
-0.212	14.155
-0.211	14.243
-0.211	13.617
-0.212	14.012
-0.212	12.795
-0.212	13.085
-0.212	13.464
-0.212	13.722
-0.212	13.475
-0.212	13.053
-0.212	12.937
-0.212	13.321
-0.212	12.312
-0.212	12.981
-0.212	11.714
-0.212	12.713
-0.212	11.797
-0.212	11.561
-0.212	11.714
-0.212	12.477
-0.212	12.29
-0.212	12.323
-0.212	11.687
-0.212	11.506
-0.212	11.534
-0.212	12.186
-0.212	11.259
-0.212	12.224
-0.211	11.457
-0.212	12.175
-0.212	12.049
-0.212	11.385

-0.211	12.449
-0.212	11.364
-0.211	11.226
-0.212	11.901
-0.212	12.224
-0.212	10.952
-0.211	11.128
-0.212	10.93
-0.212	10.925
-0.212	12.219
-0.211	11.325
-0.211	11.336
-0.211	11.276
-0.212	10.991
-0.212	10.607
-0.212	11.528
-0.212	12.005
-0.212	12.044
-0.211	11.27
-0.211	10.98
-0.212	10.59
-0.212	11.161
-0.212	11.961
-0.212	10.568
-0.212	11.714
-0.212	11.27
-0.212	10.832
-0.212	11.215
-0.212	10.645
-0.212	10.163
-0.212	11.029
-0.211	10.503
-0.212	10.7
-0.212	11.177
-0.212	10.327
-0.212	11.605
-0.212	11.106
-0.212	11.27
-0.212	10.821
-0.211	11.018
-0.212	11.226
-0.212	10.503
-0.212	10.815
-0.212	10.234
-0.212	10.201

-0.212	11.117
-0.212	10.832
-0.212	10.261
-0.212	10.344
-0.21	11.029
-0.18	11.007
-0.18	9.817
-0.075	10.755
-0.066	10.59
-0.066	11.024
-0.028	11.073
-0.029	9.938
-0.028	10.481
-0.028	9.718
-0.029	10.387
0.01	9.949
0.01	10.525
0.01	10.541
0.01	10.256
0.01	10.004
0.011	9.834
0.01	10.662
0.01	9.943
0.01	10.749
0.01	10.42
0.01	10.618
0.01	10.113
0.01	9.817
0.01	9.877
0.01	9.669
0.01	9.883
0.01	9.324
0.01	9.746
0.01	10.376
0.01	10.656
0.01	10.415
0.011	10.678
0.01	9.74
0.01	9.516
0.01	9.894
0.01	10.212
0.01	10.716
0.01	9.79
0.011	9.609
0.011	10.349

0.009	9.647
0.01	9.592
0.011	9.757
0.01	9.4
0.01	10.064
0.01	9.214
-0.211	9.713
-0.212	10.228
-0.212	9.559
-0.212	9.971
-0.212	9.417
-0.212	9.707
-0.212	9.921
-0.212	9.949
-0.212	9.165
-0.212	9.296
-0.212	9.642
-0.212	10.13
-0.212	9.148
-0.212	9.071
-0.212	9.132
-0.212	9.049
-0.212	9.335
-0.212	9.34
-0.212	8.907
-0.212	10.004
-0.212	9.11
-0.212	9.313
-0.212	10.015
-0.212	9.055
-0.213	10.146
-0.212	9.834
-0.213	10.398
-0.213	9.79
-0.212	8.973
-0.212	10.042
-0.212	9.351
-0.212	9.696
-0.212	9.044
-0.212	9.088
-0.212	9.954
-0.212	9.291
-0.212	9.905
-0.212	9.614
-0.212	9.088

-0.212	9.642
-0.212	8.786
-0.212	9.477
-0.212	9.165
-0.212	9.06