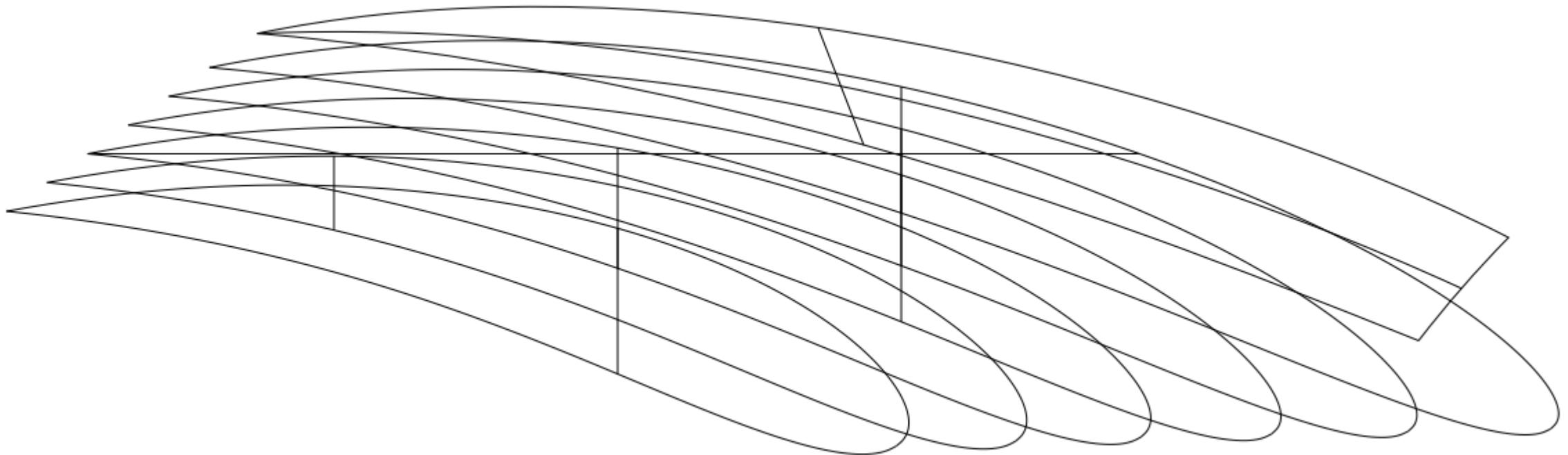


# Wind Turbine Analysis

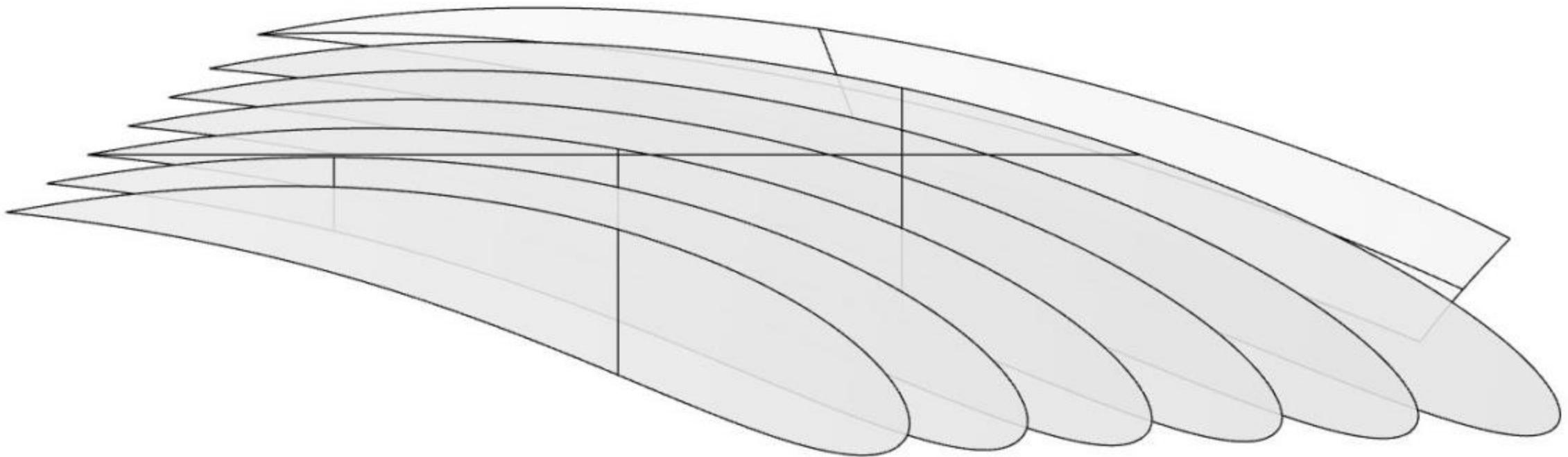
B03505043 陳麒友

B03505004 楊筌鈞

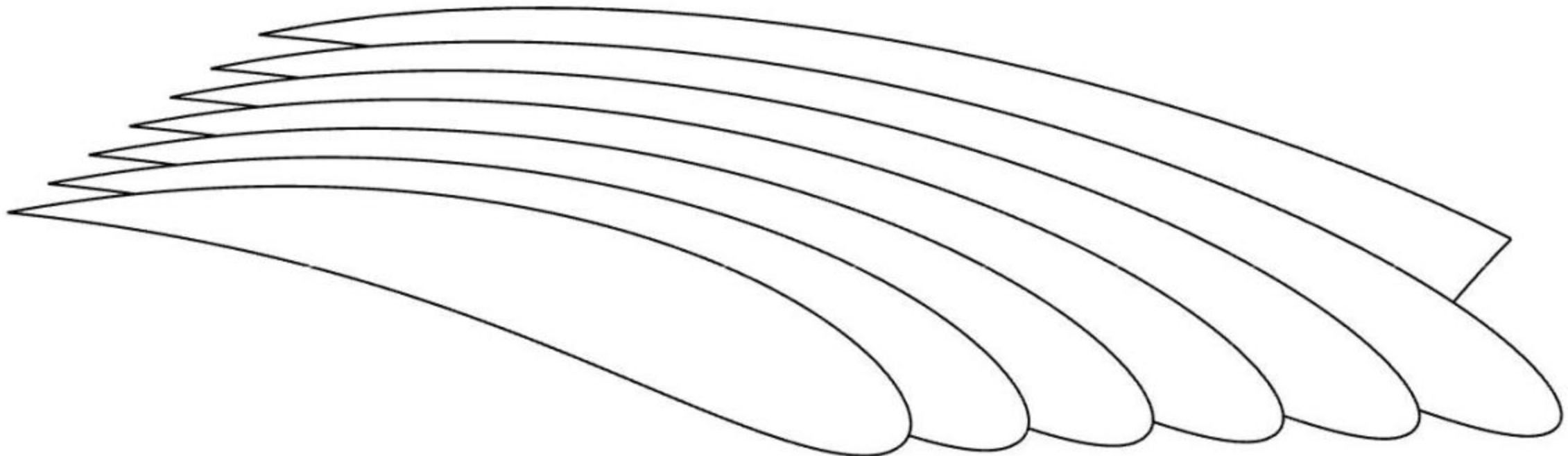
# 7u's blade



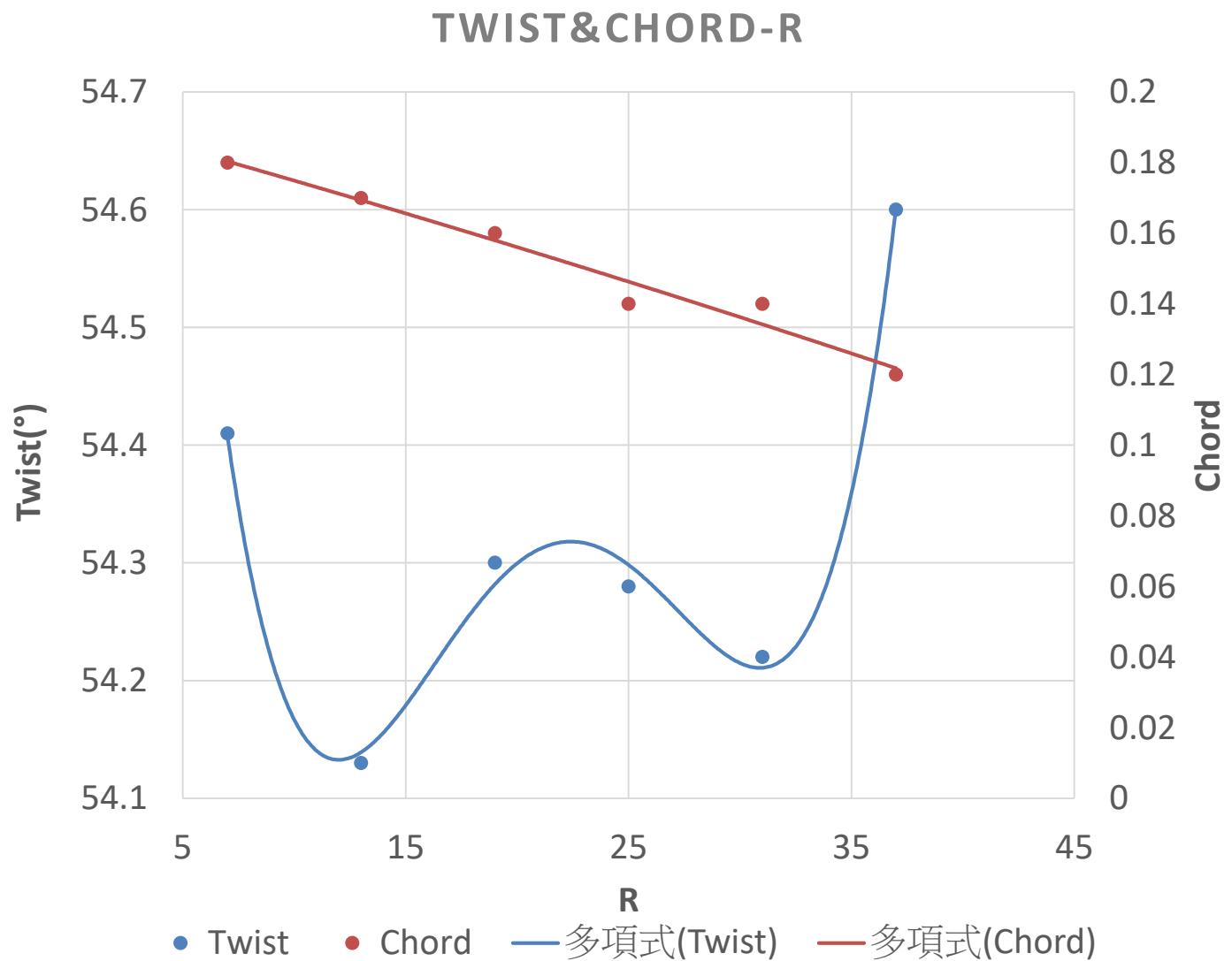
# 7u's blade



# 7u's blade



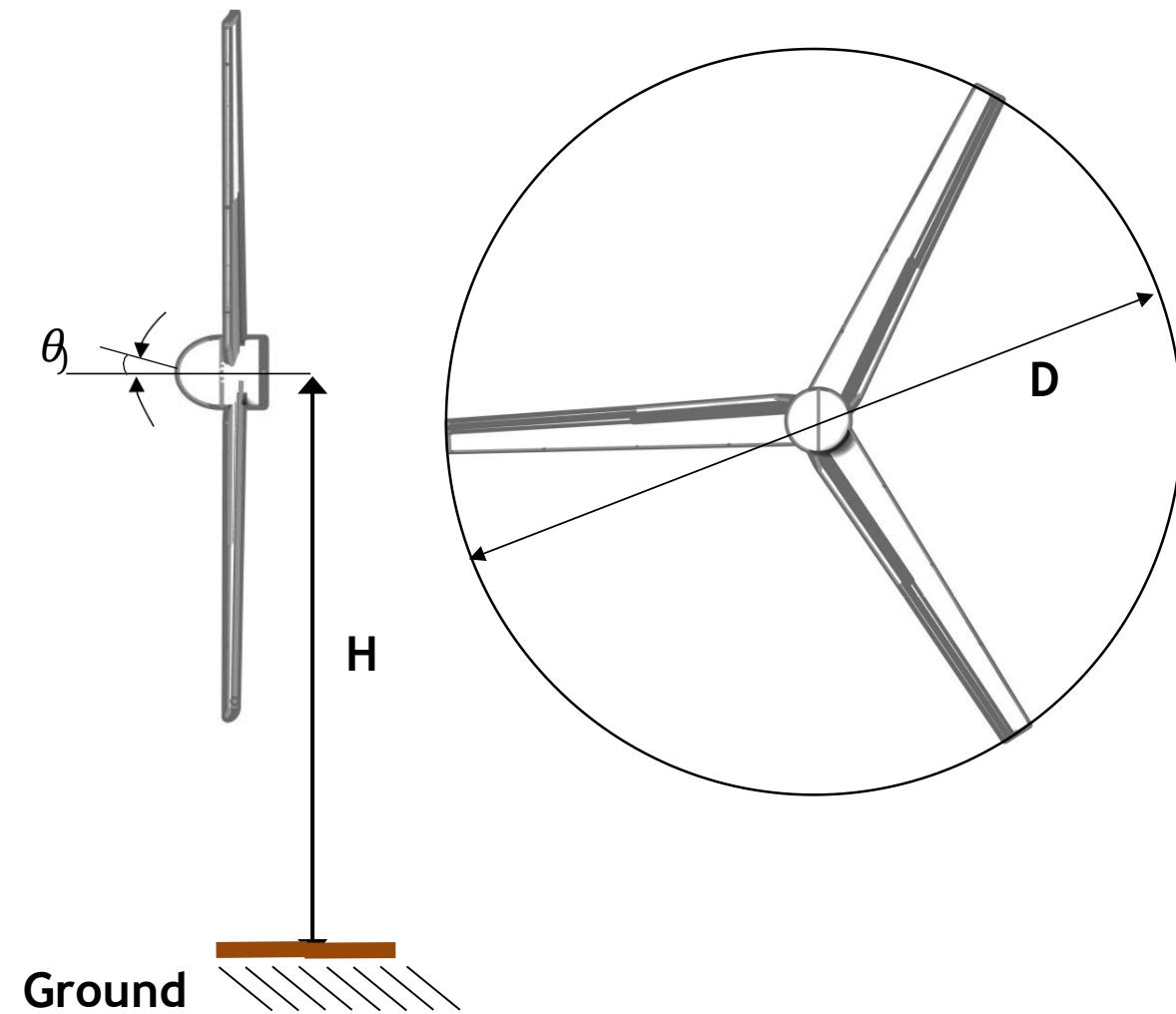
# Blade sections along radius



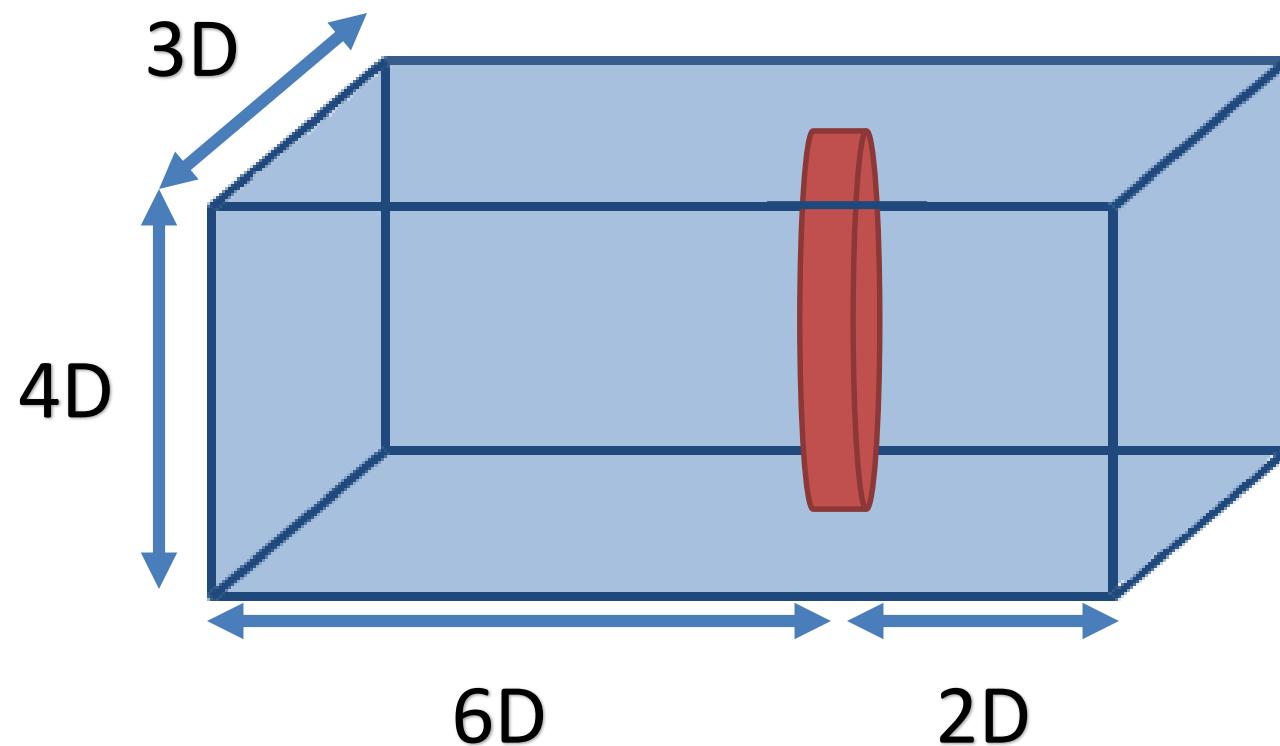
R(m)	Twist (°)	Chord
7	54.41	0.18
13	54.13	0.17
19	54.30	0.16
25	54.28	0.14
31	54.22	0.14
37	54.60	0.12

# Target Wind Turbine

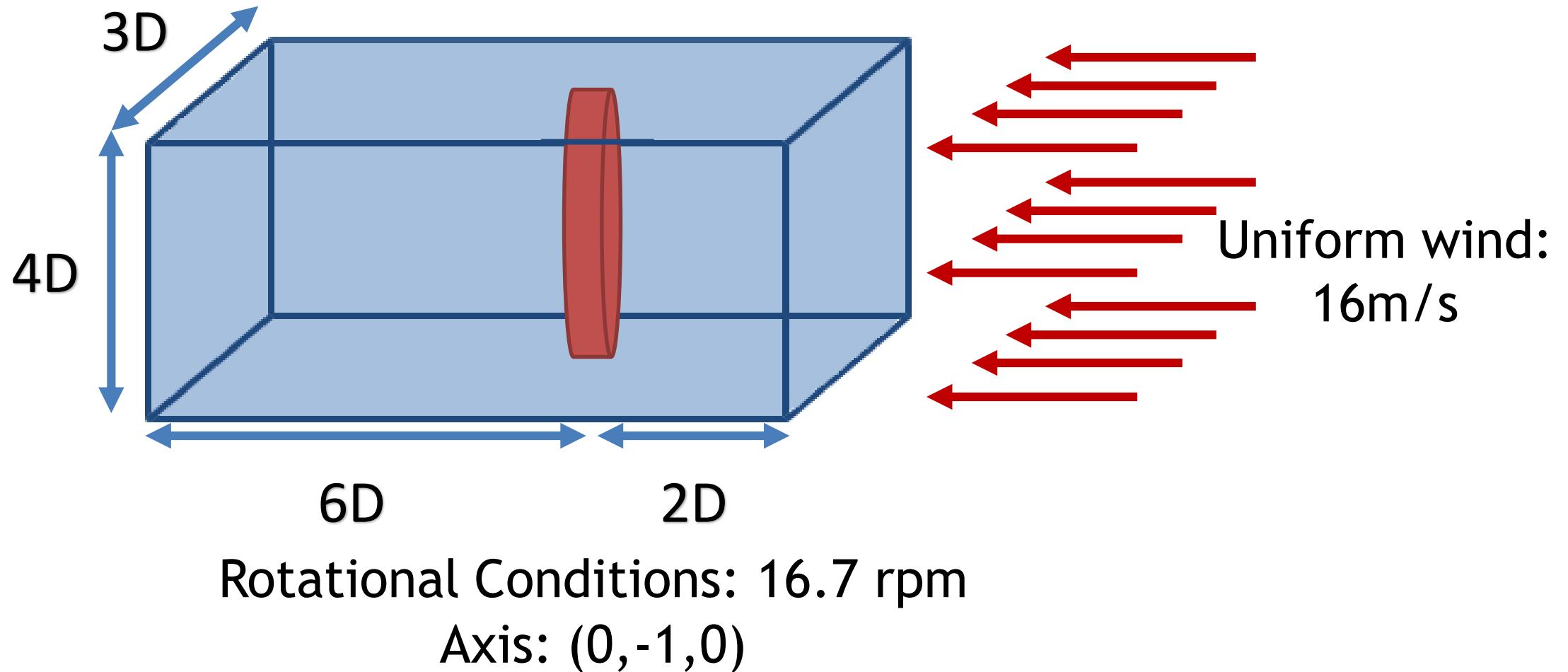
Rotor Diameter ( $D$ )	80 m
Hub Height ( $H$ )	120 m ( $1.5D$ )
Tilt Angle ( $\theta_t$ )	$0^\circ$
Rated Wind Speed	16 m/s
Rated Rotor Speed	16.7 rpm
Rated Power	4.56 MW



# Computational Domain

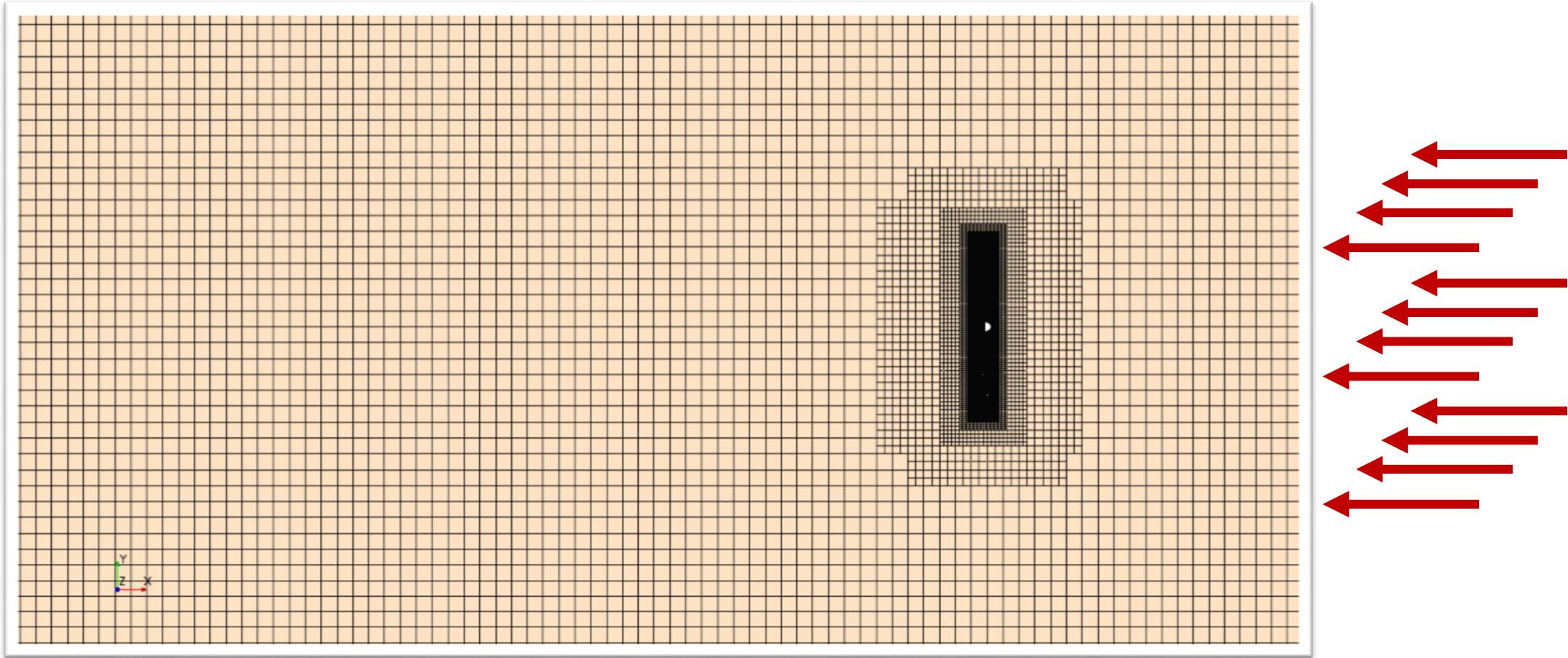


# Computational Domain



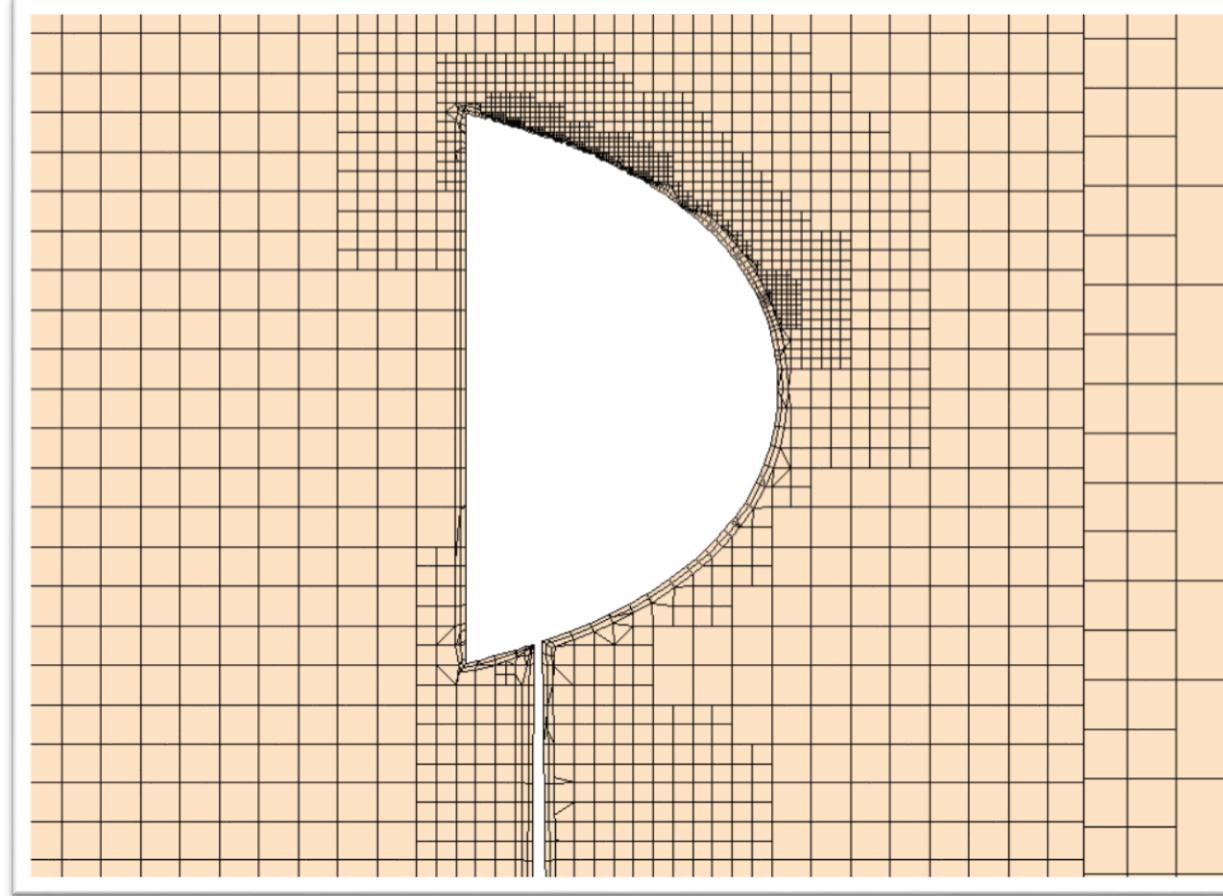
# Mesh Distribution

Total mesh: 2,884,571

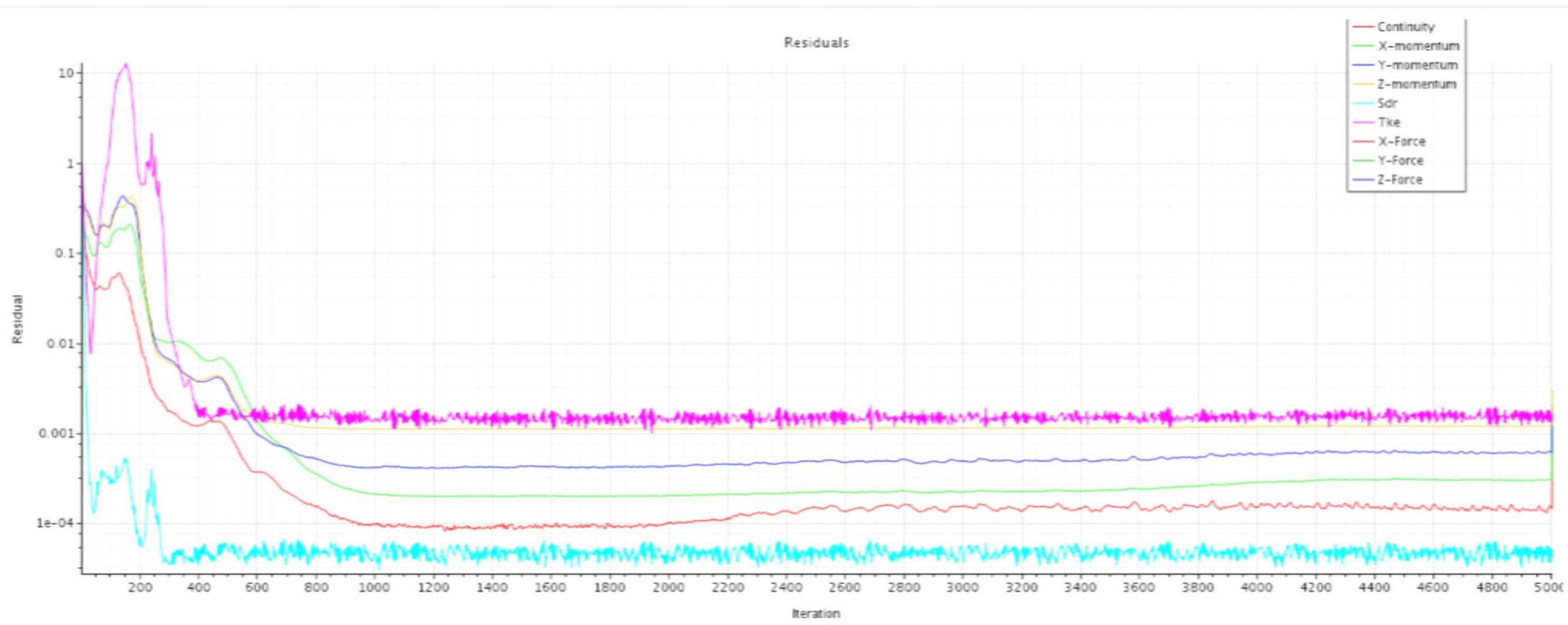


# Mesh Distribution

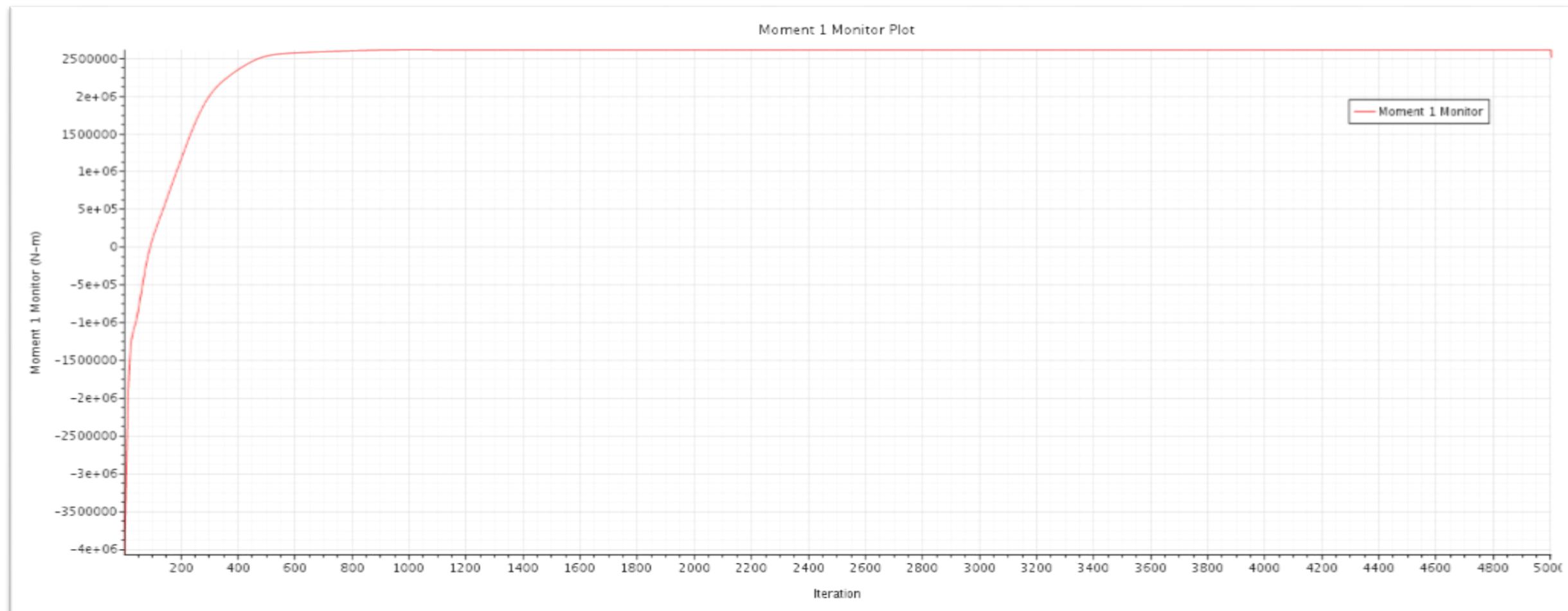
Total mesh: 2,884,571



# Convergence Condition



# Convergence Condition

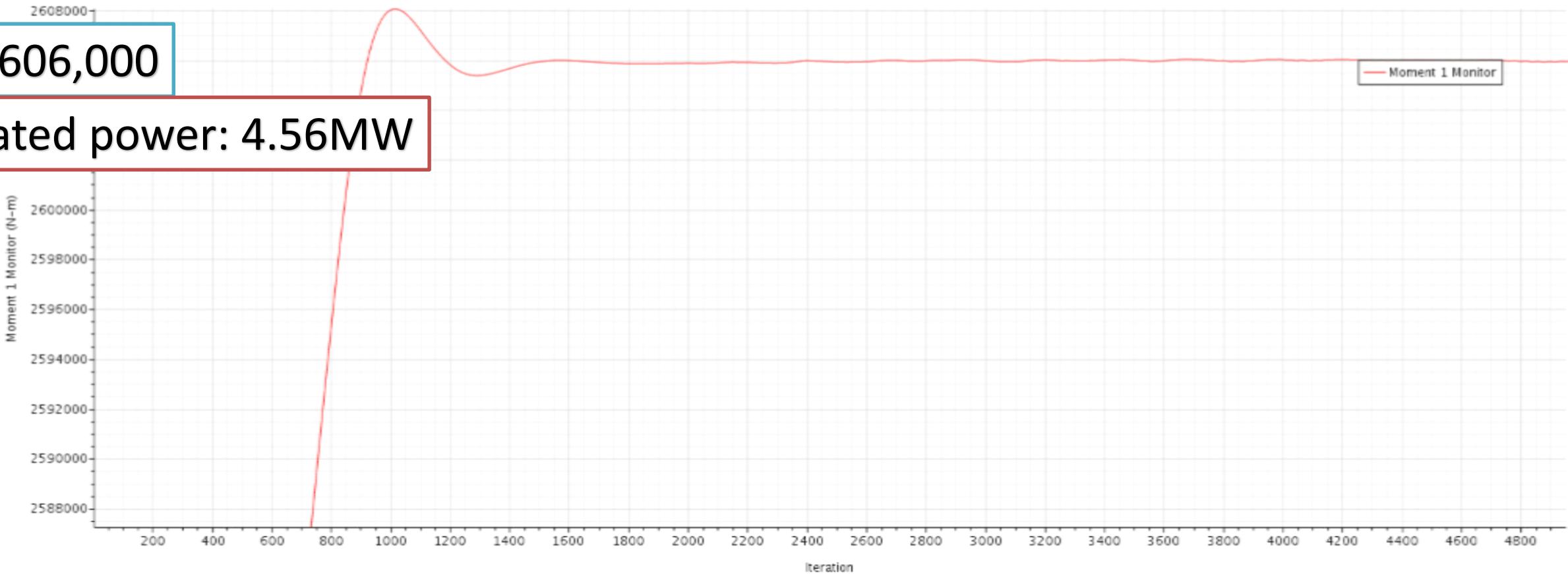


# Convergence Condition

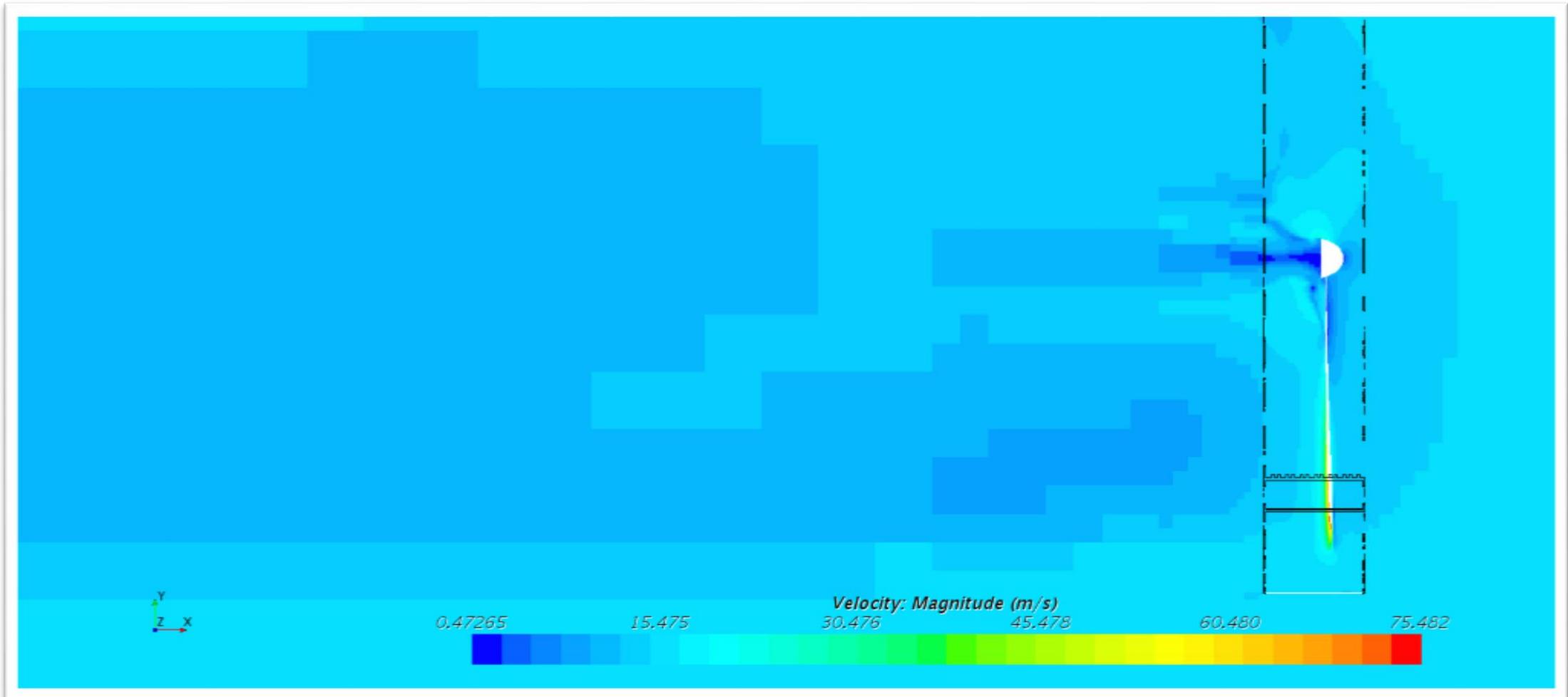
2,606,000

Rated power: 4.56MW

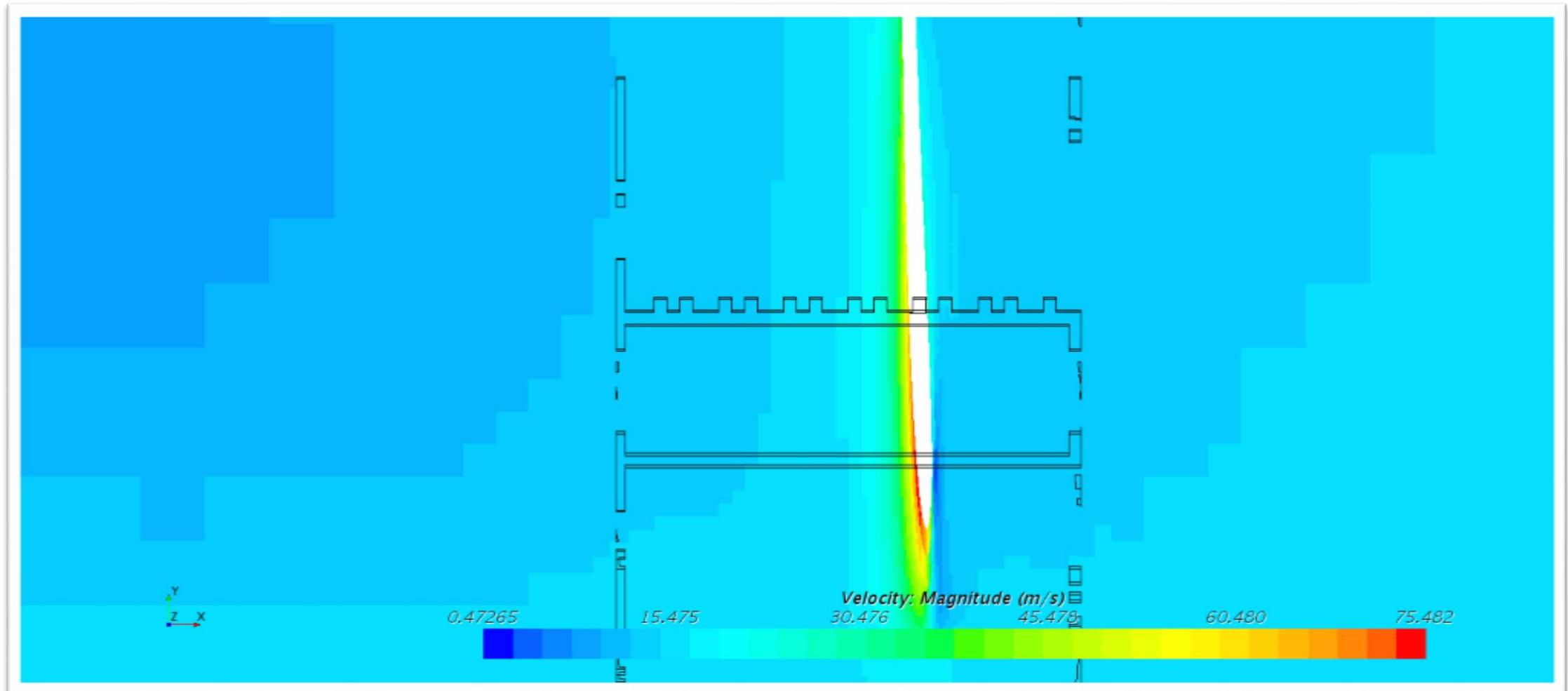
Moment 1 Monitor Plot



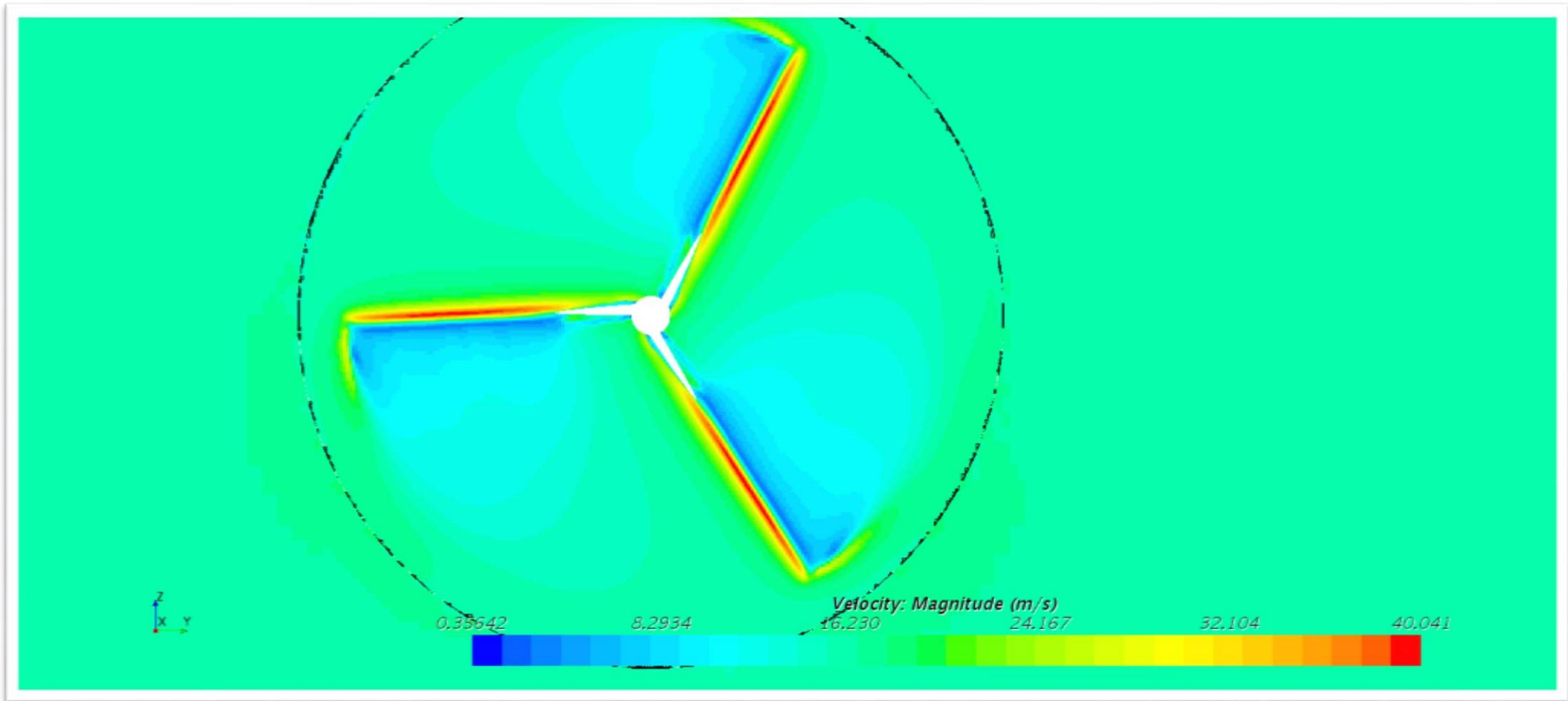
# Flow Field



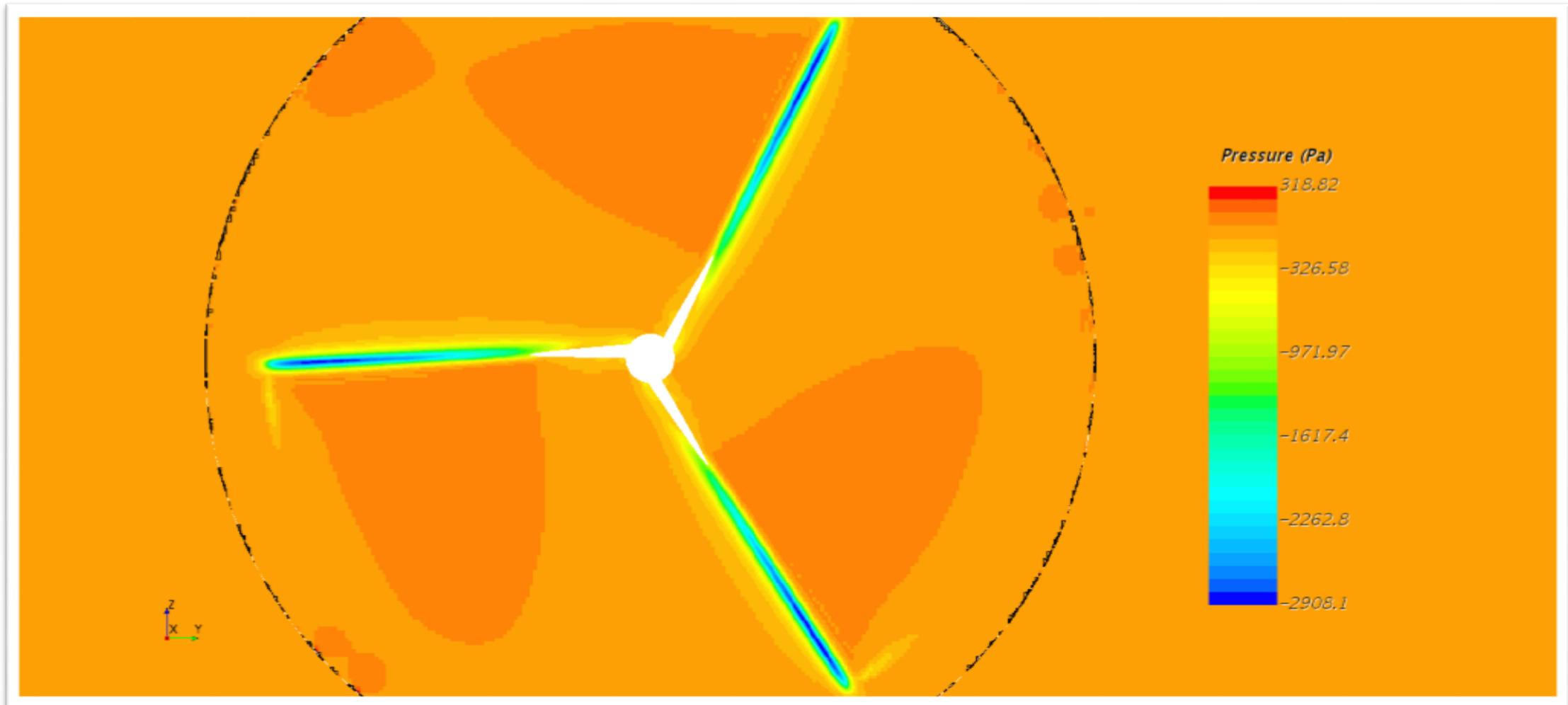
# Flow Field



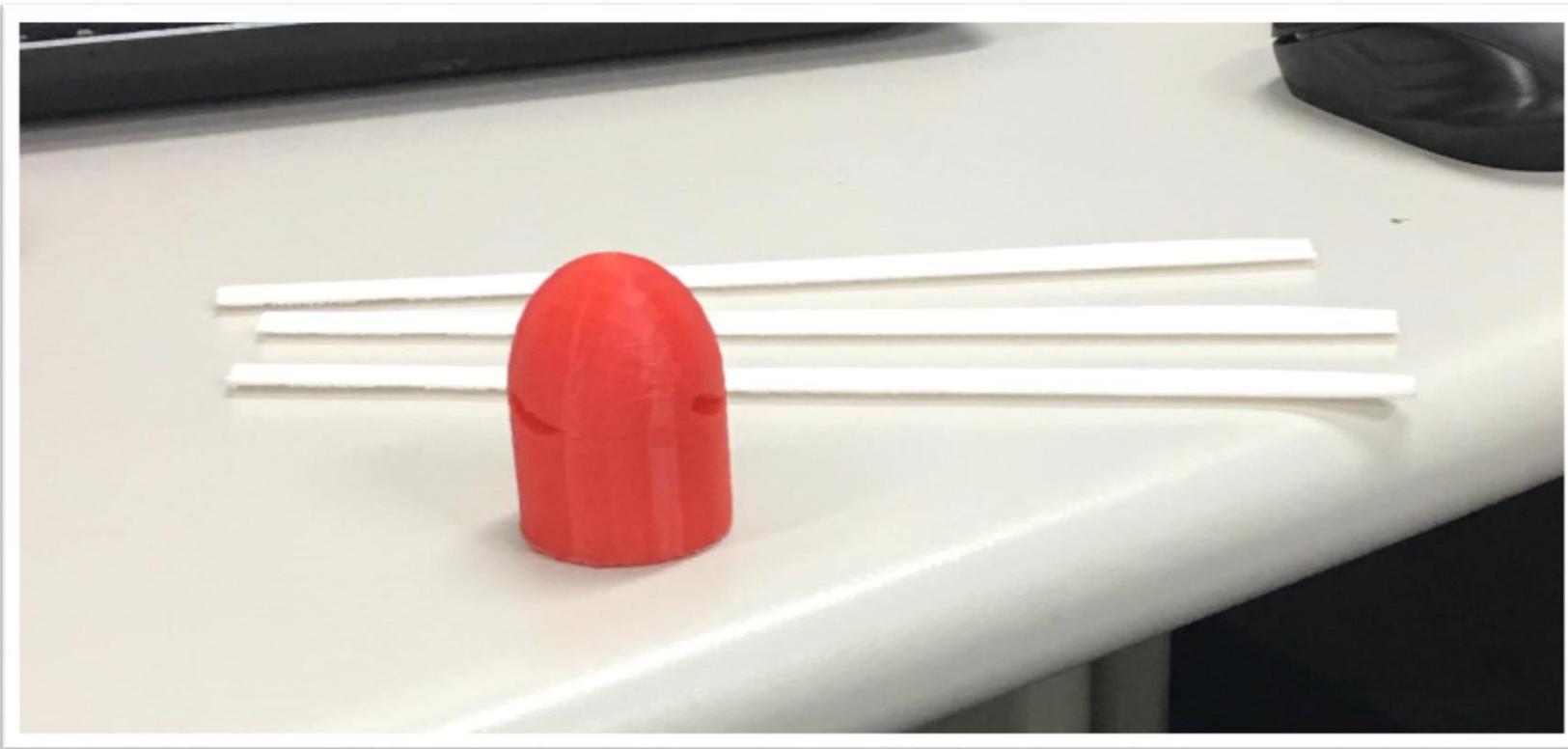
# Flow Field



# Flow Field

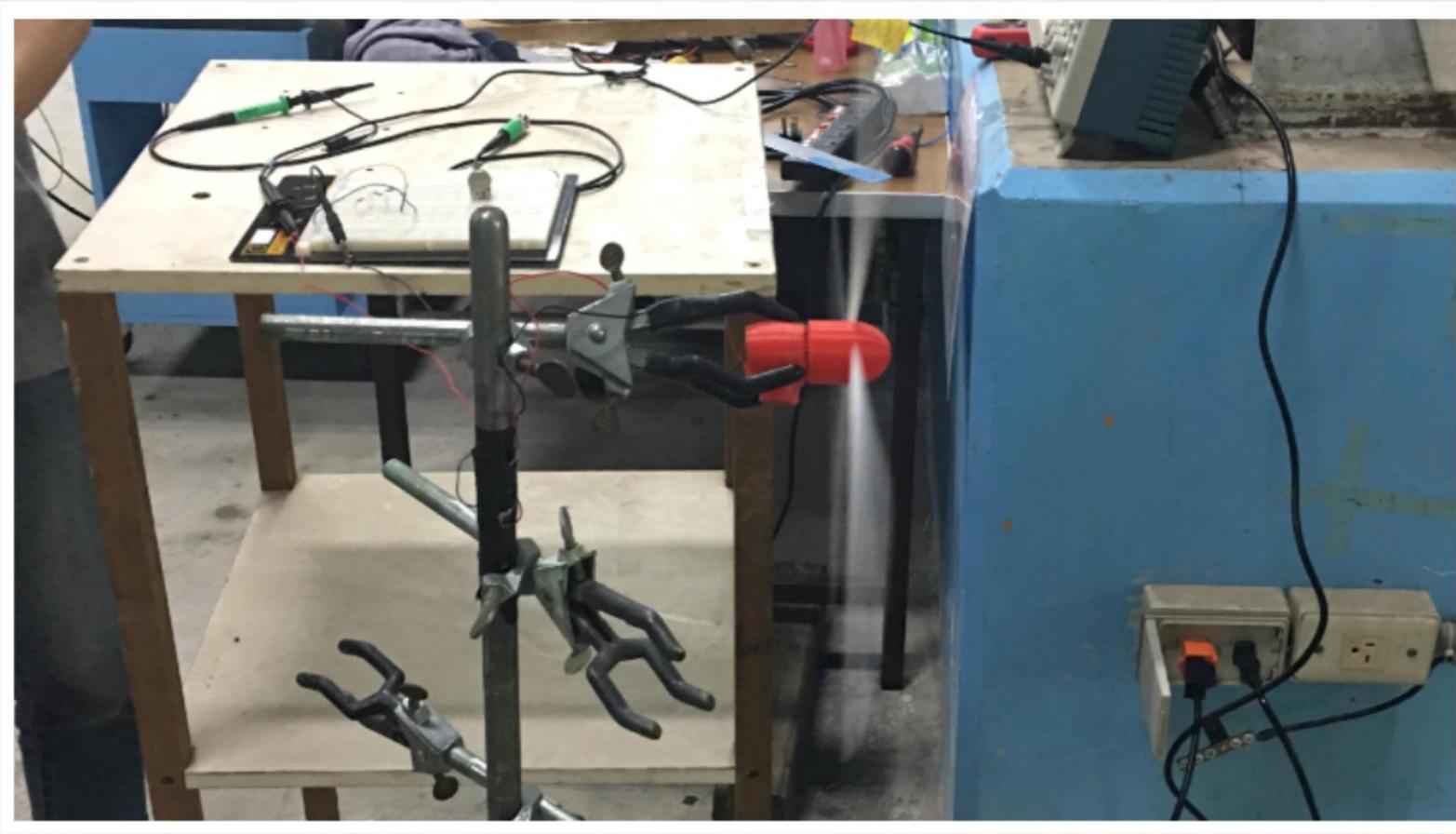


# 3D-printing



Before assembling

# 3D-printing

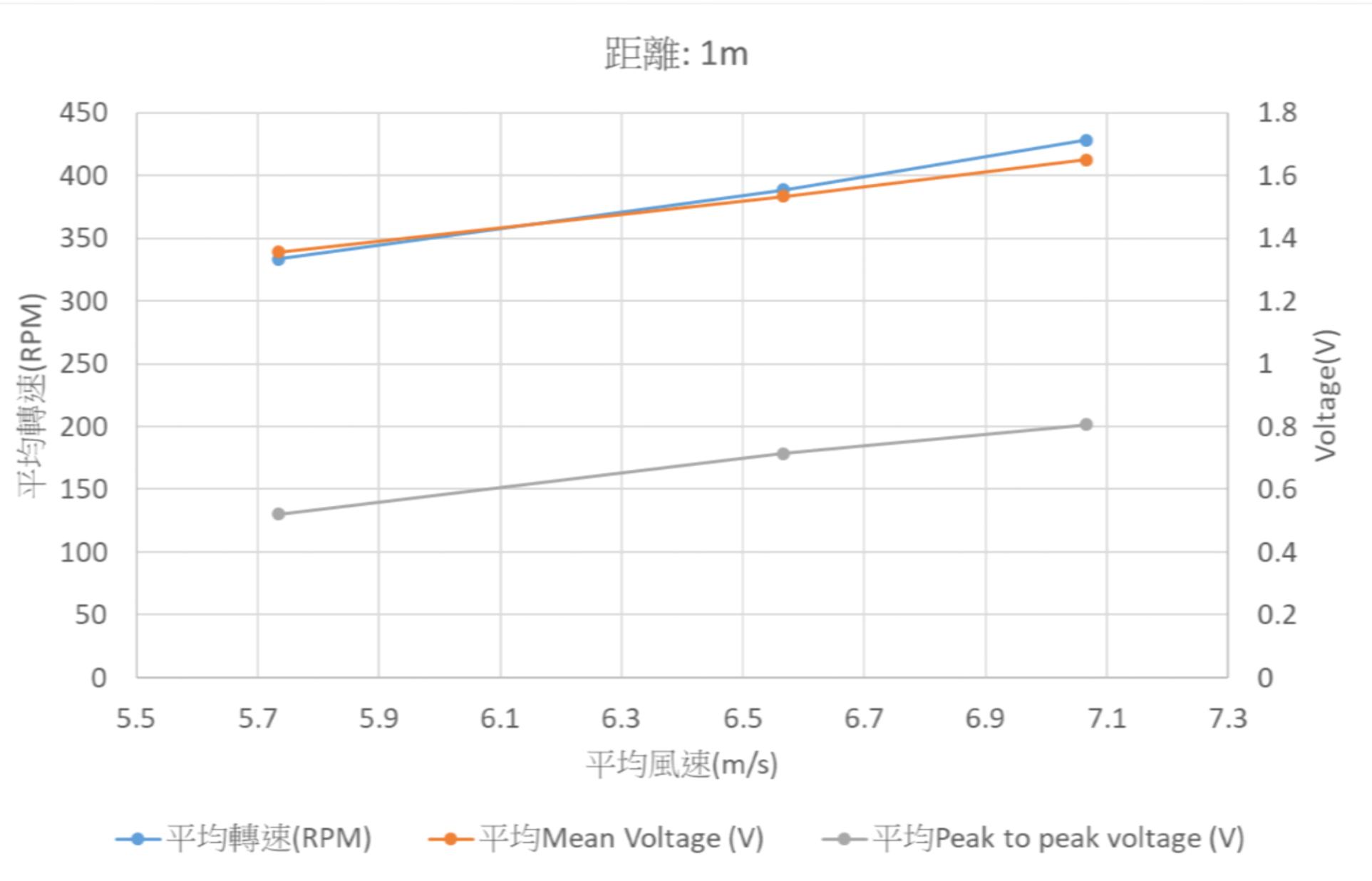


In action

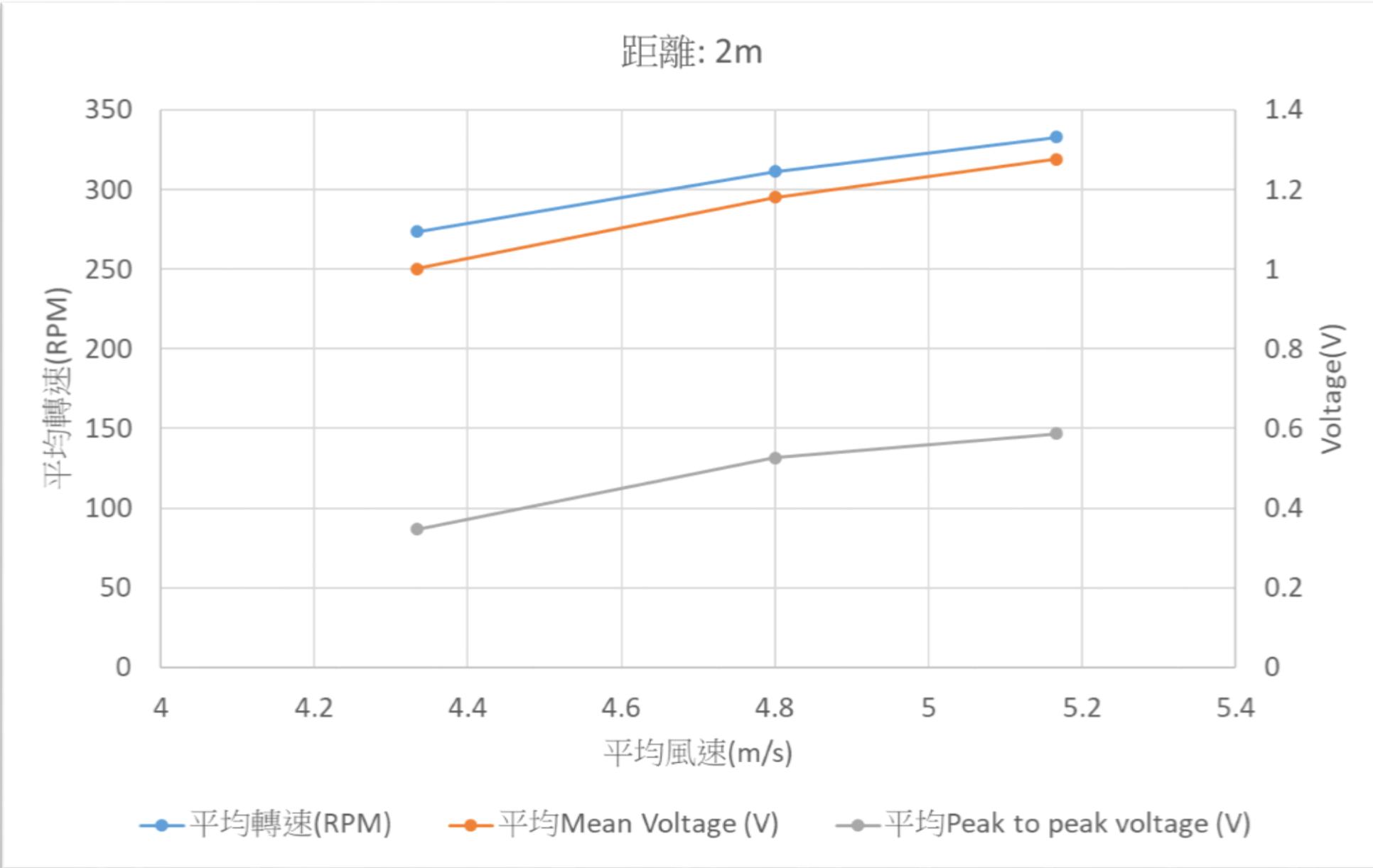
# Power Measurement

距離 (m)	風扇強度	風速 (m/s)	轉速(RPM)	Mean Voltage (V)	Peak to peak voltage (V)	平均風速(m/s)	平均轉速 (RPM)	平均Mean Voltage (V)	平均 Peak to peak voltage (V)	平均功率 (W)
1.00	弱	5.6	339.00	1.36	0.50	5.73	333.11	1.36	0.52	0.17
		5.7	329.33	1.37	0.56					
		5.9	331.00	1.34	0.50					
	中	6.4	389.33	1.54	0.76	6.57	388.44	1.53	0.71	0.21
		6.5	387.33	1.53	0.72					
		6.8	388.67	1.53	0.66					
	強	7.1	433.00	1.65	0.82	7.07	428.00	1.65	0.81	0.25
		7.2	427.67	1.66	0.72					
		6.9	423.33	1.64	0.88					
2.00	弱	4.5	276.00	1.05	0.30	4.33	273.67	1.00	0.35	0.09
		4.2	263.33	1.04	0.34					
		4.3	281.67	0.91	0.40					
	中	4.8	316.67	1.15	0.52	4.80	311.11	1.18	0.53	0.13
		4.7	313.00	1.20	0.58					
		4.9	303.67	1.19	0.48					
	強	5.0	338.67	1.24	0.56	5.17	332.89	1.28	0.59	0.15
		5.2	325.33	1.36	0.58					
		5.3	334.67	1.23	0.62					

# Power Measurement



# Power Measurement



# Power Measurement

