Apollo Launch Simulation: Orbit

inputs		outputs	
payload mass	47000.00 kg	profile area	80.12 m^2
rocket diameter	10.10 m	rocket height	84.70 m
drag coefficient	1.00	launch mass	2927338.19 kg

S-IC

height	42.00 m	volume	3364.97 m^3
density	677.50 kg/m^3	mass	2279770.49 kg
thrust	33400000.00 N	burn time	150.00 s

S-II

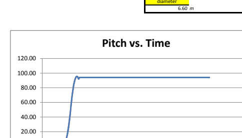
height	24.90 m	volume	1994.95 m^3
density	241.00 kg/m^3	mass	480782.81 kg
thrust	5115000.00 N	burn time	360.00 s

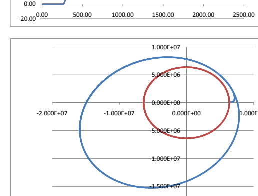
S-IVB

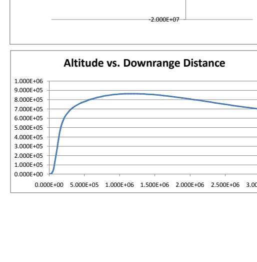
height	17.80 m	volume	608.97 m^3
density	196.70 kg/m^3	mass	119784.89 kg
thrust	1001000.00 N	burn time	500.00 s
diameter	6.60 m		

Pitch Maneuver

attitude	0.00 deg
until	250.00 s
then	1.10E-02 deg/sec^2
until	350.00 s
then	-1.50E-02 deg/sec^2
until	450.00 s
then	94.00 deg







time (s)	stage	α pitch (deg/s^2)	ω pitch (deg/s)	pitch (deg)	position angle (deg)	absolute angle (deg)	thrust (N)	thrust_x (N)	thrust_y (N)	S-IC mass (kg)	S-II mass (kg)	S-IVB mass (kg)
0.00	S-IC	0.00	0.00	0.00	0.00	0.00	3.340E+07	3.340E+07	0.000E+00	2.280E+06	4.808E+05	1.198E+05
10.00	S-IC	0.00	0.00	0.00	0.04	0.04	3.340E+07	3.340E+07	2.430E+04	2.128E+06	4.808E+05	1.198E+05
20.00	S-IC	0.00	0.00	0.00	0.08	0.08	3.340E+07	3.340E+07	4.859E+04	1.976E+06	4.808E+05	1.198E+05
30.00	S-IC	0.00	0.00	0.00	0.13	0.13	3.340E+07	3.340E+07	7.288E+04	1.824E+06	4.808E+05	1.198E+05
40.00	S-IC	0.00	0.00	0.00	0.17	0.17	3.340E+07	3.340E+07	9.717E+04	1.672E+06	4.808E+05	1.198E+05
50.00	S-IC	0.00	0.00	0.00	0.21	0.21	3.340E+07	3.340E+07	1.214E+05	1.520E+06	4.808E+05	1.198E+05
60.00	S-IC	0.00	0.00	0.00	0.25	0.25	3.340E+07	3.340E+07	1.457E+05	1.368E+06	4.808E+05	1.198E+05
70.00	S-IC	0.00	0.00	0.00	0.29	0.29	3.340E+07	3.340E+07	1.699E+05	1.216E+06	4.808E+05	1.198E+05
80.00	S-IC	0.00	0.00	0.00	0.33	0.33	3.340E+07	3.340E+07	1.942E+05	1.064E+06	4.808E+05	1.198E+05
90.00	S-IC	0.00	0.00	0.00	0.37	0.37	3.340E+07	3.340E+07	2.184E+05	9.119E+05	4.808E+05	1.198E+05
100.00	S-IC	0.00	0.00	0.00	0.42	0.42	3.340E+07	3.340E+07	2.425E+05	7.599E+05	4.808E+05	1.198E+05
110.00	S-IC	0.00	0.00	0.00	0.46	0.46	3.340E+07	3.340E+07	2.666E+05	6.079E+05	4.808E+05	1.198E+05
120.00	S-IC	0.00	0.00	0.00	0.50	0.50	3.340E+07	3.340E+07	2.907E+05	4.560E+05	4.808E+05	1.198E+05
130.00	S-IC	0.00	0.00	0.00	0.54	0.54	3.340E+07	3.340E+07	3.146E+05	3.040E+05	4.808E+05	1.198E+05
140.00	S-IC	0.00	0.00	0.00	0.58	0.58	3.340E+07	3.340E+07	3.385E+05	1.520E+05	4.808E+05	1.198E+05
150.00	S-IC	0.00	0.00	0.00	0.62	0.62	3.340E+07	3.340E+07	3.623E+05	4.181E-03	4.808E+05	1.198E+05
160.00	S-II	0.00	0.00	0.00	0.66	0.66	5.115E+06	5.115E+06	5.911E+04	0.000E+00	4.674E+05	1.198E+05
170.00	S-II	0.00	0.00	0.00	0.70	0.70	5.115E+06	5.115E+06	6.271E+04	0.000E+00	4.541E+05	1.198E+05
180.00	S-II	0.00	0.00	0.00	0.74	0.74	5.115E+06	5.115E+06	6.628E+04	0.000E+00	4.407E+05	1.198E+05
190.00	S-II	0.00	0.00	0.00	0.78	0.78	5.115E+06	5.115E+06	6.984E+04	0.000E+00	4.274E+05	1.198E+05
200.00	S-II	0.00	0.00	0.00	0.82	0.82	5.115E+06	5.114E+06	7.337E+04	0.000E+00	4.140E+05	1.198E+05
210.00	S-II	0.00	0.00	0.00	0.86	0.86	5.115E+06	5.114E+06	7.688E+04	0.000E+00	4.007E+05	1.198E+05
220.00	S-II	0.00	0.00	0.00	0.90	0.90	5.115E+06	5.114E+06	8.037E+04	0.000E+00	3.873E+05	1.198E+05
230.00	S-II	0.00	0.00	0.00	0.94	0.94	5.115E+06	5.114E+06	8.384E+04	0.000E+00	3.739E+05	1.198E+05
240.00	S-II	0.00	0.00	0.00	0.98	0.98	5.115E+06	5.114E+06	8.728E+04	0.000E+00	3.606E+05	1.198E+05
250.00	S-II	0.01	0.00	0.00	1.02	1.02	5.115E+06	5.114E+06	9.071E+04	0.000E+00	3.472E+05	1.198E+05
260.00	**S-II**	**0.01**	**0.11**	**0.00**	**1.05**	**1.05**	**5.115E+06**	**5.114E+06**	**9.411E+04**	**0.000E+00**	**3.339E+05**	**1.198E+05**
270.00	S-II	0.01	0.22	1.10	1.09	2.19	5.115E+06	5.111E+06	1.957E+05	0.000E+00	3.205E+05	1.198E+05
280.00	S-II	0.01	0.33	3.30	1.13	4.43	5.115E+06	5.100E+06	3.951E+05	0.000E+00	3.072E+05	1.198E+05
290.00	S-II	0.01	0.44	6.60	1.17	7.77	5.115E+06	5.068E+06	6.914E+05	0.000E+00	2.938E+05	1.198E+05
300.00	S-II	0.01	0.55	11.00	1.21	12.21	5.115E+06	4.999E+06	1.082E+06	0.000E+00	2.805E+05	1.198E+05
310.00	S-II	0.01	0.66	16.50	1.25	17.75	5.115E+06	4.872E+06	1.559E+06	0.000E+00	2.671E+05	1.198E+05
320.00	S-II	0.01	0.77	23.10	1.29	24.39	5.115E+06	4.658E+06	2.112E+06	0.000E+00	2.537E+05	1.198E+05
330.00	S-II	0.01	0.88	30.80	1.34	32.14	5.115E+06	4.331E+06	2.721E+06	0.000E+00	2.404E+05	1.198E+05
340.00	S-II	0.01	0.99	39.60	1.39	40.99	5.115E+06	3.861E+06	3.355E+06	0.000E+00	2.270E+05	1.198E+05
350.00	S-II	-0.02	1.10	49.50	1.45	50.95	5.115E+06	3.223E+06	3.972E+06	0.000E+00	2.137E+05	1.198E+05
360.00	S-II	-0.02	0.95	60.50	1.52	62.02	5.115E+06	2.400E+06	4.517E+06	0.000E+00	2.003E+05	1.198E+05
370.00	S-II	-0.02	0.80	70.00	1.59	71.59	5.115E+06	1.615E+06	4.853E+06	0.000E+00	1.870E+05	1.198E+05
380.00	S-II	-0.02	0.65	78.00	1.68	79.68	5.115E+06	9.165E+05	5.032E+06	0.000E+00	1.736E+05	1.198E+05
390.00	S-II	-0.02	0.50	84.50	1.78	86.28	5.115E+06	3.321E+05	5.104E+06	0.000E+00	1.603E+05	1.198E+05
400.00	S-II	-0.02	0.35	89.50	1.89	91.39	5.115E+06	-1.239E+05	5.113E+06	0.000E+00	1.469E+05	1.198E+05
410.00	S-II	-0.02	0.20	93.00	2.01	95.01	5.115E+06	-4.468E+05	5.095E+06	0.000E+00	1.336E+05	1.198E+05
420.00	S-II	-0.02	0.05	95.00	2.15	97.15	5.115E+06	-6.365E+05	5.075E+06	0.000E+00	1.202E+05	1.198E+05
430.00	S-II	-0.02	-0.10	95.50	2.30	97.80	5.115E+06	-6.941E+05	5.068E+06	0.000E+00	1.068E+05	1.198E+05
440.00	S-II	-0.02	-0.25	94.50	2.46	96.96	5.115E+06	-6.202E+05	5.077E+06	0.000E+00	9.349E+04	1.198E+05
450.00	S-II	0.00	-0.40	92.00	2.64	94.64	5.115E+06	-4.141E+05	5.098E+06	0.000E+00	8.013E+04	1.198E+05
460.00	S-II	0.00	-0.40	94.00	2.84	96.84	5.115E+06	-6.092E+05	5.079E+06	0.000E+00	6.678E+04	1.198E+05
470.00	S-II	0.00	-0.40	94.00	3.05	97.05	5.115E+06	-6.280E+05	5.076E+06	0.000E+00	5.342E+04	1.198E+05
480.00	S-II	0.00	-0.40	94.00	3.28	97.28	5.115E+06	-6.485E+05	5.074E+06	0.000E+00	4.007E+04	1.198E+05
490.00	S-II	0.00	-0.40	94.00	3.53	97.53	5.115E+06	-6.705E+05	5.071E+06	0.000E+00	2.671E+04	1.198E+05
500.00	S-II	0.00	-0.40	94.00	3.80	97.80	5.115E+06	-6.944E+05	5.068E+06	0.000E+00	1.336E+04	1.198E+05
510.00	S-IVB	0.00	-0.40	94.00	4.09	98.09	1.001E+06	-1.409E+05	9.910E+05	0.000E+00	0.000E+00	1.198E+05
520.00	S-IVB	0.00	-0.40	94.00	4.39	98.39	1.001E+06	-1.461E+05	9.903E+05	0.000E+00	0.000E+00	1.174E+05
530.00	S-IVB	0.00	-0.40	94.00	4.69	98.69	1.001E+06	-1.512E+05	9.895E+05	0.000E+00	0.000E+00	1.150E+05
540.00	S-IVB	0.00	-0.40	94.00	4.99	98.99	1.001E+06	-1.565E+05	9.887E+05	0.000E+00	0.000E+00	1.126E+05
550.00	S-IVB	0.00	-0.40	94.00	5.30	99.30	1.001E+06	-1.618E+05	9.878E+05	0.000E+00	0.000E+00	1.102E+05
560.00	S-IVB	0.00	-0.40	94.00	5.61	99.61	1.001E+06	-1.672E+05	9.869E+05	0.000E+00	0.000E+00	1.078E+05
570.00	S-IVB	0.00	-0.40	94.00	5.93	99.93	1.001E+06	-1.726E+05	9.860E+05	0.000E+00	0.000E+00	1.054E+05
580.00	S-IVB	0.00	-0.40	94.00	6.25	100.25	1.001E+06	-1.782E+05	9.850E+05	0.000E+00	0.000E+00	1.030E+05
590.00	S-IVB	0.00	-0.40	94.00	6.58	100.58	1.001E+06	-1.838E+05	9.840E+05	0.000E+00	0.000E+00	1.006E+05
600.00	S-IVB	0.00	-0.40	94.00	6.91	100.91	1.001E+06	-1.895E+05	9.829E+05	0.000E+00	0.000E+00	9.822E+04
610.00	S-IVB	0.00	-0.40	94.00	7.25	101.25	1.001E+06	-1.952E+05	9.818E+05	0.000E+00	0.000E+00	9.583E+04
620.00	S-IVB	0.00	-0.40	94.00	7.59	101.59	1.001E+06	-2.011E+05	9.806E+05	0.000E+00	0.000E+00	9.343E+04
630.00	S-IVB	0.00	-0.40	94.00	7.93	101.93	1.001E+06	-2.070E+05	9.794E+05	0.000E+00	0.000E+00	9.104E+04
640.00	S-IVB	0.00	-0.40	94.00	8.28	102.28	1.001E+06	-2.130E+05	9.781E+05	0.000E+00	0.000E+00	8.864E+04
650.00	S-IVB	0.00	-0.40	94.00	8.64	102.64	1.001E+06	-2.191E+05	9.767E+05	0.000E+00	0.000E+00	8.625E+04
660.00	S-IVB	0.00	-0.40	94.00	9.00	103.00	1.001E+06	-2.253E+05	9.753E+05	0.000E+00	0.000E+00	8.385E+04
670.00	S-IVB	0.00	-0.40	94.00	9.37	103.37	1.001E+06	-2.315E+05	9.739E+05	0.000E+00	0.000E+00	8.145E+04
680.00	S-IVB	0.00	-0.40	94.00	9.75	103.75	1.001E+06	-2.379E+05	9.723E+05	0.000E+00	0.000E+00	7.906E+04
690.00	S-IVB	0.00	-0.40	94.00	10.13	104.13	1.001E+06	-2.443E+05	9.707E+05	0.000E+00	0.000E+00	7.666E+04
700.00	S-IVB	0.00	-0.40	94.00	10.52	104.52	1.001E+06	-2.509E+05	9.690E+05	0.000E+00	0.000E+00	7.427E+04
710.00	S-IVB	0.00	-0.40	94.00	10.91	104.91	1.001E+06	-2.575E+05	9.673E+05	0.000E+00	0.000E+00	7.187E+04
720.00	S-IVB	0.00	-0.40	94.00	11.31	105.31	1.001E+06	-2.643E+05	9.655E+05	0.000E+00	0.000E+00	6.948E+04
730.00	S-IVB	0.00	-0.40	94.00	11.72	105.72	1.001E+06	-2.712E+05	9.636E+05	0.000E+00	0.000E+00	6.708E+04
740.00	S-IVB	0.00	-0.40	94.00	12.13	106.13	1.001E+06	-2.781E+05	9.616E+05	0.000E+00	0.000E+00	6.468E+04
750.00	S-IVB	0.00	-0.40	94.00	12.55	106.55	1.001E+06	-2.852E+05	9.595E+05	0.000E+00	0.000E+00	6.229E+04
760.00	S-IVB	0.00	-0.40	94.00	12.98	106.98	1.001E+06	-2.924E+05	9.574E+05	0.000E+00	0.000E+00	5.989E+04
770.00	S-IVB	0.00	-0.40	94.00	13.42	107.42	1.001E+06	-2.996E+05	9.551E+05	0.000E+00	0.000E+00	5.750E+04
780.00	S-IVB	0.00	-0.40	94.00	13.86	107.86	1.001E+06	-3.070E+05	9.527E+05	0.000E+00	0.000E+00	5.510E+04
790.00	**S-IVB**	**0.00**	**-0.40**	**94.00**	**14.32**	**108.32**	**1.001E+06**	**-3.146E+05**	**9.503E+05**	**0.000E+00**	**0.000E+00**	**5.271E+04**
800.00	S-IVB	0.00	-0.40	94.00	14.78	108.78	1.001E+06	-3.222E+05	9.477E+05	0.000E+00	0.000E+00	5.031E+04
810.00	S-IVB	0.00	-0.40	94.00	15.25	109.25	1.001E+06	-3.300E+05	9.451E+05	0.000E+00	0.000E+00	4.791E+04
820.00	S-IVB	0.00	-0.40	94.00	15.73	109.73	1.001E+06	-3.379E+05	9.423E+05	0.000E+00	0.000E+00	4.552E+04
830.00	S-IVB	0.00	-0.40	94.00	16.21	110.21	1.001E+06	-3.459E+05	9.393E+05	0.000E+00	0.000E+00	4.312E+04
840.00	S-IVB	0.00	-0.40	94.00	16.71	110.71	1.001E+06	-3.540E+05	9.363E+05	0.000E+00	0.000E+00	4.073E+04
850.00	S-IVB	0.00	-0.40	94.00	17.22	111.22	1.001E+06	-3.623E+05	9.331E+05	0.000E+00	0.000E+00	3.833E+04
860.00	S-IVB	0.00	-0.40	94.00	17.74	111.74	1.001E+06	-3.707E+05	9.298E+05	0.000E+00	0.000E+00	3.594E+04
870.00	S-IVB	0.00	-0.40	94.00	18.26	112.26	1.001E+06	-3.793E+05	9.264E+05	0.000E+00	0.000E+00	3.354E+04
880.00	S-IVB	0.00	-0.40	94.00	18.80	112.80	1.001E+06	-3.879E+05	9.228E+05	0.000E+00	0.000E+00	3.114E+04
890.00	S-IVB	0.00	-0.40	94.00	19.35	113.35	1.001E+06	-3.968E+05	9.190E+05	0.000E+00	0.000E+00	2.875E+04
900.00	S-IVB	0.00	-0.40	94.00	19.91	113.91	1.001E+06	-4.058E+05	9.151E+05	0.000E+00	0.000E+00	2.635E+04
910.00	S-IVB	0.00	-0.40	94.00	20.49	114.49	1.001E+06	-4.149E+05	9.110E+05	0.000E+00	0.000E+00	2.396E+04
920.00	S-IVB	0.00	-0.40	94.00	21.07	115.07	1.001E+06	-4.242E+05	9.067E+05	0.000E+00	0.000E+00	2.156E+04
930.00	S-IVB	0.00	-0.40	94.00	21.67	115.67	1.001E+06	-4.336E+05	9.022E+05	0.000E+00	0.000E+00	1.917E+04
940.00	S-IVB	0.00	-0.40	94.00	22.28	116.28	1.001E+06	-4.433E+05	8.975E+05	0.000E+00	0.000E+00	1.677E+04
950.00	S-IVB	0.00	-0.40	94.00	22.91	116.91	1.001E+06	-4.530E+05	8.926E+05	0.000E+00	0.000E+00	1.437E+04
960.00	S-IVB	0.00	-0.40	94.00	23.55	117.55	1.001E+06	-4.630E+05	8.875E+05	0.000E+00	0.000E+00	1.198E+04
970.00	S-IVB	0.00	-0.40	94.00	24.20	118.20	1.001E+06	-4.731E+05	8.821E+05	0.000E+00	0.000E+00	9.583E+03
980.00	S-IVB	0.00	-0.40	94.00	24.88	118.88	1.001E+06	-4.834E+05	8.765E+05	0.000E+00	0.000E+00	7.187E+03
990.00	S-IVB	0.00	-0.40	94.00	25.56	119.56	1.001E+06	-4.939E+05	8.707E+05	0.000E+00	0.000E+00	4.791E+03
1000.00	S-IVB	0.00	-0.40	94.00	26.27	120.27	1.001E+06	-5.045E+05	8.646E+05	0.000E+00	0.000E+00	2.396E+03
1010.00	Free fall	0.00	-0.40	94.00	26.99	120.99	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
1020.00	Free fall	0.00	-0.40	94.00	27.71	121.71	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
1030.00	Free fall	0.00	-0.40	94.00	28.44	122.44	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
1040.00	Free fall	0.00	-0.40	94.00	29.16	123.16	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
1050.00	Free fall	0.00	-0.40	94.00	29.89	123.89	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
1060.00	Free fall	0.00	-0.40	94.00	30.62	124.62	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
1070.00	Free fall	0.00	-0.40	94.00	31.34	125.34	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
1080.00	Free fall	0.00	-0.40	94.00	32.07	126.07	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
1090.00	Free fall	0.00	-0.40	94.00	32.81	126.81	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
1100.00	Free fall	0.00	-0.40	94.00	33.54	127.54	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
1110.00	Free fall	0.00	-0.40	94.00	34.27	128.27	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
1120.00	Free fall	0.00	-0.40	94.00	35.00	129.00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
1130.00	Free fall	0.00	-0.40	94.00	35.74	129.74	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
1140.00	Free fall	0.00	-0.40	94.00	36.47	130.47	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
1150.00	Free fall	0.00	-0.40	94.00	37.20	131.20	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
1160.00	Free fall	0.00	-0.40	94.00	37.94	131.94	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
1170.00	Free fall	0.00	-0.40	94.00	38.68	132.68	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
1180.00	Free fall	0.00	-0.40	94.00	39.41	133.41	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
1190.00	Free fall	0.00	-0.40	94.00	40.15	134.15	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
1200.00	Free fall	0.00	-0.40	94.00	40.88	134.88	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
1210.00	Free fall	0.00	-0.40	94.00	41.62	135.62	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
1220.00	Free fall	0.00	-0.40	94.00	42.36	136.36	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
1230.00	Free fall	0.00	-0.40	94.00	43.09	137.09	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
1240.00	Free fall	0.00	-0.40	94.00	43.83	137.83	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
1250.00	Free fall	0.00	-0.40	94.00	44.56	138.56	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
1260.00	Free fall	0.00	-0.40	94.00	45.30	139.30	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
1270.00	Free fall	0.00	-0.40	94.00	46.03	140.03	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
1280.00	Free fall	0.00	-0.40	94.00	46.77	140.77	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
1290.00	Free fall	0.00	-0.40	94.00	47.50	141.50	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
1300.00	Free fall	0.00	-0.40	94.00	48.23	142.23	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
1310.00	Free fall	0.00	-0.40	94.00	48.97	142.97	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
1320.00	**Free fall**	**0.00**	**-0.40**	**94.00**	**49.70**	**143.70**	**0.000E+00**	**0.000E+00**	**0.000E+00**	**0.000E+00**	**0.000E+00**	**0.000E+00**
1330.00	Free fall	0.00	-0.40	94.00	50.43	144.43	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
1340.00	Free fall	0.00	-0.40	94.00	51.16	145.16	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
1350.00	Free fall	0.00	-0.40	94.00	51.89	145.89	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
1360.00	Free fall	0.00	-0.40	94.00	52.62	146.62	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
1370.00	Free fall	0.00	-0.40	94.00	53.34	147.34	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
1380.00	Free fall	0.00	-0.40	94.00	54.07	148.07	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00

time (s)	mass (kg)	g (m/s^2)	weight (N)	weight_x (N)	weight_y (N)	air density (kg/m^3)	drag (N)	drag_x (N)	drag_y (N)	net force_x (N)	net force_y (N)
0.00	2.927E+06	9.800E+00	2.869E+07	-2.869E+07	0.000E+00	1.200E+00	0.000E+00	0.000E+00	0.000E+00	4.712E+06	0.000E+00
10.00	2.775E+06	9.800E+00	2.720E+07	-2.720E+07	-1.978E+04	1.173E+00	1.218E+04	-1.218E+04	-8.858E+00	6.191E+06	4.504E+03
20.00	2.623E+06	9.798E+00	2.570E+07	-2.570E+07	-3.740E+04	1.111E+00	6.566E+04	-6.566E+04	-9.553E+01	7.630E+06	1.110E+04
30.00	2.471E+06	9.796E+00	2.421E+07	-2.421E+07	-5.283E+04	1.011E+00	1.844E+05	-1.844E+05	-4.024E+02	9.005E+06	1.965E+04
40.00	2.319E+06	9.793E+00	2.271E+07	-2.271E+07	-6.608E+04	8.735E-01	3.779E+05	-3.779E+05	-1.100E+03	1.031E+07	2.999E+04
50.00	2.167E+06	9.788E+00	2.122E+07	-2.122E+07	-7.714E+04	7.094E-01	6.255E+05	-6.255E+05	-2.274E+03	1.156E+07	4.203E+04
60.00	2.015E+06	9.782E+00	1.972E+07	-1.972E+07	-8.601E+04	5.347E-01	8.714E+05	-8.713E+05	-3.801E+03	1.281E+07	5.590E+04
70.00	1.863E+06	9.774E+00	1.821E+07	-1.821E+07	-9.267E+04	3.688E-01	1.040E+06	-1.040E+06	-5.290E+03	1.415E+07	7.198E+04
80.00	1.711E+06	9.763E+00	1.671E+07	-1.671E+07	-9.714E+04	2.288E-01	1.067E+06	-1.067E+06	-6.202E+03	1.562E+07	9.082E+04
90.00	1.559E+06	9.750E+00	1.521E+07	-1.520E+07	-9.941E+04	1.250E-01	9.364E+05	-9.364E+05	-6.122E+03	1.726E+07	1.128E+05
100.00	1.407E+06	9.734E+00	1.370E+07	-1.370E+07	-9.947E+04	5.852E-02	6.915E+05	-6.915E+05	-5.021E+03	1.901E+07	1.380E+05
110.00	1.256E+06	9.713E+00	1.219E+07	-1.219E+07	-9.734E+04	2.270E-02	4.183E+05	-4.183E+05	-3.339E+03	2.079E+07	1.659E+05
120.00	1.104E+06	9.687E+00	1.069E+07	-1.069E+07	-9.303E+04	6.995E-03	1.995E+05	-1.995E+05	-1.736E+03	2.251E+07	1.959E+05
130.00	9.515E+05	9.655E+00	9.188E+06	-9.187E+06	-8.655E+04	1.623E-03	7.136E+04	-7.136E+04	-6.723E+02	2.414E+07	2.274E+05
140.00	7.996E+05	9.616E+00	7.689E+06	-7.688E+06	-7.793E+04	2.645E-04	1.795E+04	-1.795E+04	-1.819E+02	2.569E+07	2.604E+05
150.00	6.476E+05	9.568E+00	6.196E+06	-6.195E+06	-6.721E+04	2.759E-05	2.910E+03	-2.910E+03	-3.157E+01	2.720E+07	2.951E+05
160.00	6.342E+05	9.507E+00	6.030E+06	-6.029E+06	-6.968E+04	1.605E-06	2.682E+02	-2.682E+02	-3.100E+00	-9.150E+05	-1.057E+04
170.00	6.209E+05	9.448E+00	5.866E+06	-5.865E+06	-7.191E+04	9.517E-08	1.569E+01	-1.569E+01	-1.923E-01	-7.508E+05	-9.205E+03
180.00	6.075E+05	9.389E+00	5.704E+06	-5.704E+06	-7.392E+04	5.738E-09	9.345E-01	-9.344E-01	-1.211E-02	-5.891E+05	-7.634E+03
190.00	5.941E+05	9.332E+00	5.544E+06	-5.544E+06	-7.570E+04	3.505E-10	5.653E-02	-5.653E-02	-7.719E-04	-4.294E+05	-5.863E+03
200.00	5.808E+05	9.275E+00	5.387E+06	-5.386E+06	-7.727E+04	2.162E-11	3.461E-03	-3.461E-03	-4.965E-05	-2.717E+05	-3.897E+03
210.00	5.674E+05	9.218E+00	5.231E+06	-5.230E+06	-7.862E+04	1.341E-12	2.138E-04	-2.137E-04	-3.213E-06	-1.158E+05	-1.741E+03
220.00	5.541E+05	9.163E+00	5.077E+06	-5.076E+06	-7.977E+04	8.342E-14	1.327E-05	-1.327E-05	-2.085E-07	3.819E+04	6.002E+02
230.00	5.407E+05	9.107E+00	4.925E+06	-4.924E+06	-8.071E+04	5.181E-15	8.247E-07	-8.246E-07	-1.352E-08	1.905E+05	3.122E+03
240.00	5.274E+05	9.052E+00	4.774E+06	-4.773E+06	-8.146E+04	3.201E-16	5.113E-08	-5.112E-08	-8.725E-10	3.410E+05	5.820E+03
250.00	5.140E+05	8.998E+00	4.625E+06	-4.624E+06	-8.202E+04	1.959E-17	3.150E-09	-3.149E-09	-5.585E-11	4.900E+05	8.691E+03
260.00	**5.007E+05**	**8.943E+00**	**4.478E+06**	**-4.477E+06**	**-8.239E+04**	**1.183E-18**	**1.920E-10**	**-1.919E-10**	**-3.532E-12**	**6.373E+05**	**1.173E+04**
270.00	4.873E+05	8.889E+00	4.332E+06	-4.331E+06	-8.257E+04	7.013E-20	1.153E-11	-1.152E-11	-4.409E-13	7.804E+05	1.131E+05
280.00	4.740E+05	8.835E+00	4.187E+06	-4.186E+06	-8.258E+04	4.064E-21	6.787E-13	-6.766E-13	-5.242E-14	9.133E+05	3.125E+05
290.00	4.606E+05	8.781E+00	4.044E+06	-4.043E+06	-8.246E+04	2.292E-22	3.900E-14	-3.865E-14	-5.272E-15	1.025E+06	6.089E+05
300.00	4.472E+05	8.726E+00	3.903E+06	-3.902E+06	-8.223E+04	1.252E-23	2.178E-15	-2.128E-15	-4.605E-16	1.097E+06	9.993E+05
310.00	4.339E+05	8.672E+00	3.763E+06	-3.762E+06	-8.194E+04	6.606E-25	1.177E-16	-1.121E-16	-3.586E-17	1.110E+06	1.477E+06
320.00	4.205E+05	8.617E+00	3.624E+06	-3.623E+06	-8.165E+04	3.358E-26	6.133E-18	-5.586E-18	-2.533E-18	1.036E+06	2.031E+06
330.00	4.072E+05	8.563E+00	3.486E+06	-3.486E+06	-8.141E+04	1.646E-27	3.084E-19	-2.611E-19	-1.640E-19	8.457E+05	2.640E+06
340.00	3.938E+05	8.508E+00	3.351E+06	-3.350E+06	-8.127E+04	7.817E-29	1.500E-20	-1.132E-20	-9.838E-21	5.114E+05	3.274E+06
350.00	3.805E+05	8.453E+00	3.216E+06	-3.215E+06	-8.130E+04	3.633E-30	7.113E-22	-4.481E-22	-5.524E-22	7.471E+03	3.891E+06
360.00	3.671E+05	8.399E+00	3.083E+06	-3.082E+06	-8.153E+04	1.680E-31	3.337E-23	-1.566E-23	-2.946E-23	-6.821E+05	4.435E+06
370.00	3.538E+05	8.345E+00	2.952E+06	-2.951E+06	-8.199E+04	7.922E-33	1.583E-24	-4.998E-25	-1.502E-24	-1.336E+06	4.771E+06
380.00	3.404E+05	8.293E+00	2.823E+06	-2.822E+06	-8.270E+04	3.910E-34	7.802E-26	-1.398E-26	-7.676E-26	-1.905E+06	4.950E+06
390.00	3.270E+05	8.243E+00	2.696E+06	-2.695E+06	-8.361E+04	2.068E-35	4.105E-27	-2.665E-28	-4.096E-27	-2.362E+06	5.021E+06
400.00	3.137E+05	8.195E+00	2.571E+06	-2.569E+06	-8.469E+04	1.197E-36	2.363E-28	5.725E-30	-2.363E-28	-2.693E+06	5.029E+06
410.00	3.003E+05	8.148E+00	2.447E+06	-2.446E+06	-8.590E+04	7.719E-38	1.522E-29	1.329E-30	-1.516E-29	-2.893E+06	5.010E+06
420.00	2.870E+05	8.105E+00	2.326E+06	-2.324E+06	-8.719E+04	5.615E-39	1.115E-30	1.388E-31	-1.106E-30	-2.961E+06	4.988E+06
430.00	2.736E+05	8.063E+00	2.206E+06	-2.205E+06	-8.850E+04	4.642E-40	9.419E-32	1.278E-32	-9.332E-32	-2.899E+06	4.979E+06
440.00	2.603E+05	8.024E+00	2.089E+06	-2.087E+06	-8.978E+04	4.369E-41	9.226E-33	1.119E-33	-9.158E-33	-2.707E+06	4.987E+06
450.00	2.469E+05	7.988E+00	1.972E+06	-1.970E+06	-9.098E+04	4.653E-42	1.045E-33	8.464E-35	-1.042E-33	-2.384E+06	5.007E+06
460.00	2.336E+05	7.953E+00	1.858E+06	-1.855E+06	-9.203E+04	5.536E-43	1.354E-34	1.613E-35	-1.344E-34	-2.464E+06	4.987E+06
470.00	2.202E+05	7.921E+00	1.744E+06	-1.742E+06	-9.288E+04	7.418E-44	2.000E-35	2.455E-36	-1.984E-35	-2.370E+06	4.983E+06
480.00	2.069E+05	7.891E+00	1.632E+06	-1.629E+06	-9.348E+04	1.118E-44	3.370E-36	4.273E-37	-3.343E-36	-2.278E+06	4.980E+06
490.00	1.935E+05	7.862E+00	1.521E+06	-1.518E+06	-9.374E+04	1.894E-45	6.460E-37	8.468E-38	-6.404E-37	-2.189E+06	4.977E+06
500.00	1.801E+05	7.836E+00	1.412E+06	-1.408E+06	-9.362E+04	3.595E-46	1.403E-37	1.904E-38	-1.390E-37	-2.103E+06	4.974E+06
510.00	1.668E+05	7.811E+00	1.303E+06	-1.300E+06	-9.303E+04	7.638E-47	3.438E-38	4.841E-39	-3.404E-38	-1.440E+06	8.980E+05
520.00	1.644E+05	7.788E+00	1.280E+06	-1.277E+06	-9.801E+04	1.772E-47	8.128E-39	1.186E-39	-8.041E-39	-1.423E+06	8.923E+05
530.00	1.620E+05	7.767E+00	1.258E+06	-1.254E+06	-1.029E+05	4.488E-48	2.100E-39	3.173E-40	-2.076E-39	-1.405E+06	8.866E+05
540.00	1.596E+05	7.747E+00	1.236E+06	-1.232E+06	-1.076E+05	1.239E-48	5.925E-40	9.262E-41	-5.852E-40	-1.388E+06	8.811E+05
550.00	1.572E+05	7.728E+00	1.215E+06	-1.210E+06	-1.123E+05	3.724E-49	1.823E-40	2.946E-41	-1.799E-40	-1.372E+06	8.756E+05
560.00	1.548E+05	7.711E+00	1.194E+06	-1.188E+06	-1.168E+05	1.218E-49	6.110E-41	1.021E-41	-6.024E-41	-1.355E+06	8.702E+05
570.00	1.524E+05	7.695E+00	1.173E+06	-1.167E+06	-1.212E+05	4.328E-50	2.229E-41	3.844E-42	-2.196E-41	-1.339E+06	8.648E+05
580.00	1.500E+05	7.680E+00	1.152E+06	-1.145E+06	-1.255E+05	1.670E-50	8.839E-42	1.573E-42	-8.698E-42	-1.323E+06	8.595E+05
590.00	1.476E+05	7.667E+00	1.132E+06	-1.124E+06	-1.297E+05	6.988E-51	3.806E-42	6.987E-43	-3.741E-42	-1.308E+06	8.543E+05
600.00	1.452E+05	7.655E+00	1.112E+06	-1.104E+06	-1.337E+05	3.169E-51	1.777E-42	3.364E-43	-1.745E-42	-1.293E+06	8.492E+05
610.00	1.428E+05	7.644E+00	1.092E+06	-1.083E+06	-1.377E+05	1.555E-51	8.993E-43	1.754E-43	-8.820E-43	-1.278E+06	8.441E+05
620.00	1.404E+05	7.634E+00	1.072E+06	-1.063E+06	-1.415E+05	8.247E-52	4.923E-43	9.888E-44	-4.823E-43	-1.264E+06	8.391E+05
630.00	1.380E+05	7.626E+00	1.053E+06	-1.043E+06	-1.453E+05	4.724E-52	2.913E-43	6.023E-44	-2.850E-43	-1.250E+06	8.341E+05
640.00	1.356E+05	7.619E+00	1.033E+06	-1.023E+06	-1.489E+05	2.919E-52	1.861E-43	3.959E-44	-1.818E-43	-1.236E+06	8.292E+05
650.00	1.332E+05	7.612E+00	1.014E+06	-1.003E+06	-1.524E+05	1.943E-52	1.281E-43	2.805E-44	-1.250E-43	-1.222E+06	8.243E+05
660.00	1.308E+05	7.607E+00	9.954E+05	-9.832E+05	-1.558E+05	1.392E-52	9.503E-44	2.139E-44	-9.260E-44	-1.208E+06	8.195E+05
670.00	1.285E+05	7.603E+00	9.767E+05	-9.637E+05	-1.591E+05	1.072E-52	7.579E-44	1.753E-44	-7.374E-44	-1.195E+06	8.148E+05
680.00	1.261E+05	7.601E+00	9.581E+05	-9.443E+05	-1.622E+05	8.856E-53	6.492E-44	1.543E-44	-6.306E-44	-1.182E+06	8.101E+05
690.00	1.237E+05	7.599E+00	9.397E+05	-9.250E+05	-1.653E+05	7.845E-53	5.965E-44	1.456E-44	-5.784E-44	-1.169E+06	8.055E+05
700.00	1.213E+05	7.598E+00	9.214E+05	-9.059E+05	-1.682E+05	7.441E-53	5.870E-44	1.471E-44	-5.682E-44	-1.157E+06	8.009E+05
710.00	1.189E+05	7.598E+00	9.032E+05	-8.869E+05	-1.709E+05	7.545E-53	6.178E-44	1.590E-44	-5.970E-44	-1.144E+06	7.964E+05
720.00	1.165E+05	7.599E+00	8.851E+05	-8.679E+05	-1.736E+05	8.167E-53	6.945E-44	1.834E-44	-6.699E-44	-1.132E+06	7.919E+05
730.00	1.141E+05	7.602E+00	8.672E+05	-8.491E+05	-1.761E+05	9.424E-53	8.326E-44	2.255E-44	-8.015E-44	-1.120E+06	7.875E+05
740.00	1.117E+05	7.605E+00	8.493E+05	-8.303E+05	-1.785E+05	1.158E-52	1.063E-43	2.953E-44	-1.021E-43	-1.108E+06	7.831E+05
750.00	1.093E+05	7.609E+00	8.315E+05	-8.117E+05	-1.807E+05	1.511E-52	1.442E-43	4.108E-44	-1.382E-43	-1.097E+06	7.788E+05
760.00	1.069E+05	7.614E+00	8.138E+05	-7.930E+05	-1.828E+05	2.092E-52	2.077E-43	6.065E-44	-1.986E-43	-1.085E+06	7.745E+05
770.00	1.045E+05	7.619E+00	7.962E+05	-7.745E+05	-1.848E+05	3.069E-52	3.169E-43	9.485E-44	-3.023E-43	-1.074E+06	7.703E+05
780.00	1.021E+05	7.626E+00	7.786E+05	-7.559E+05	-1.866E+05	4.759E-52	5.112E-43	1.568E-43	-4.866E-43	-1.063E+06	7.662E+05
790.00	**9.971E+04**	**7.634E+00**	**7.611E+05**	**-7.375E+05**	**-1.882E+05**	**7.788E-52**	**8.708E-43**	**2.736E-43**	**-8.266E-43**	**-1.052E+06**	**7.621E+05**
800.00	9.731E+04	7.642E+00	7.436E+05	-7.190E+05	-1.897E+05	1.342E-51	1.562E-42	5.029E-43	-1.479E-42	-1.041E+06	7.581E+05
810.00	9.491E+04	7.651E+00	7.262E+05	-7.006E+05	-1.910E+05	2.432E-51	2.948E-42	9.717E-43	-2.783E-42	-1.031E+06	7.541E+05
820.00	9.252E+04	7.661E+00	7.088E+05	-6.822E+05	-1.921E+05	4.622E-51	5.835E-42	1.969E-42	-5.493E-42	-1.020E+06	7.502E+05
830.00	9.012E+04	7.671E+00	6.914E+05	-6.639E+05	-1.930E+05	9.193E-51	1.209E-41	4.178E-42	-1.135E-41	-1.010E+06	7.463E+05
840.00	8.773E+04	7.682E+00	6.740E+05	-6.455E+05	-1.938E+05	1.909E-50	2.617E-41	9.256E-42	-2.448E-41	-9.995E+05	7.425E+05
850.00	8.533E+04	7.694E+00	6.566E+05	-6.271E+05	-1.944E+05	4.131E-50	5.902E-41	2.136E-41	-5.502E-41	-9.894E+05	7.388E+05
860.00	8.294E+04	7.707E+00	6.392E+05	-6.088E+05	-1.947E+05	9.285E-50	1.383E-40	5.123E-41	-1.285E-40	-9.795E+05	7.351E+05
870.00	8.054E+04	7.720E+00	6.218E+05	-5.904E+05	-1.949E+05	2.163E-49	3.361E-40	1.273E-40	-3.110E-40	-9.697E+05	7.315E+05
880.00	7.814E+04	7.733E+00	6.043E+05	-5.721E+05	-1.948E+05	5.205E-49	8.440E-40	3.271E-40	-7.780E-40	-9.600E+05	7.280E+05
890.00	7.575E+04	7.748E+00	5.869E+05	-5.537E+05	-1.945E+05	1.291E-48	2.184E-39	8.658E-40	-2.005E-39	-9.505E+05	7.245E+05
900.00	7.335E+04	7.762E+00	5.694E+05	-5.353E+05	-1.939E+05	3.287E-48	5.808E-39	2.354E-39	-5.309E-39	-9.411E+05	7.211E+05
910.00	7.096E+04	7.777E+00	5.518E+05	-5.169E+05	-1.931E+05	8.571E-48	1.581E-38	6.555E-39	-1.439E-38	-9.318E+05	7.178E+05
920.00	6.856E+04	7.792E+00	5.343E+05	-4.985E+05	-1.921E+05	2.279E-47	4.395E-38	1.862E-38	-3.980E-38	-9.227E+05	7.146E+05
930.00	6.617E+04	7.808E+00	5.166E+05	-4.801E+05	-1.908E+05	6.161E-47	1.242E-37	5.379E-38	-1.119E-37	-9.138E+05	7.114E+05
940.00	6.377E+04	7.824E+00	4.989E+05	-4.617E+05	-1.892E+05	1.686E-46	3.554E-37	1.574E-37	-3.186E-37	-9.049E+05	7.083E+05
950.00	6.137E+04	7.840E+00	4.812E+05	-4.432E+05	-1.873E+05	4.652E-46	1.026E-36	4.644E-37	-9.149E-37	-8.963E+05	7.053E+05
960.00	5.898E+04	7.856E+00	4.633E+05	-4.248E+05	-1.851E+05	1.288E-45	2.975E-36	1.376E-36	-2.638E-36	-8.877E+05	7.024E+05
970.00	5.658E+04	7.872E+00	4.454E+05	-4.063E+05	-1.826E+05	3.565E-45	8.625E-36	4.077E-36	-7.601E-36	-8.794E+05	6.995E+05
980.00	5.419E+04	7.888E+00	4.275E+05	-3.878E+05	-1.798E+05	9.808E-45	2.488E-35	1.201E-35	-2.178E-35	-8.712E+05	6.967E+05
990.00	5.179E+04	7.904E+00	4.094E+05	-3.693E+05	-1.766E+05	2.668E-44	7.101E-35	3.504E-35	-6.177E-35	-8.632E+05	6.940E+05
1000.00	4.940E+04	7.920E+00	3.912E+05	-3.508E+05	-1.731E+05	7.138E-44	1.995E-34	1.005E-34	-1.723E-34	-8.554E+05	6.914E+05
1010.00	4.700E+04	7.936E+00	3.730E+05	-3.324E+05	-1.693E+05	1.866E-43	5.483E-34	2.823E-34	-4.700E-34	-3.324E+05	-1.693E+05
1020.00	4.700E+04	7.950E+00	3.737E+05	-3.308E+05	-1.738E+05	4.659E-43	1.371E-33	7.209E-34	-1.167E-33	-3.308E+05	-1.738E+05
1030.00	4.700E+04	7.965E+00	3.743E+05	-3.292E+05	-1.782E+05	1.110E-42	3.274E-33	1.756E-33	-2.764E-33	-3.292E+05	-1.782E+05
1040.00	4.700E+04	7.978E+00	3.750E+05	-3.274E+05	-1.827E+05	2.525E-42	7.461E-33	4.081E-33	-6.246E-33	-3.274E+05	-1.827E+05
1050.00	4.700E+04	7.990E+00	3.756E+05	-3.256E+05	-1.871E+05	5.481E-42	1.622E-32	9.043E-33	-1.346E-32	-3.256E+05	-1.871E+05
1060.00	4.700E+04	8.002E+00	3.761E+05	-3.237E+05	-1.915E+05	1.135E-41	3.364E-32	1.911E-32	-2.768E-32	-3.237E+05	-1.915E+05
1070.00	4.700E+04	8.013E+00	3.766E+05	-3.217E+05	-1.959E+05	2.241E-41	6.653E-32	3.849E-32	-5.427E-32	-3.217E+05	-1.959E+05
1080.00	4.700E+04	8.024E+00	3.771E+05	-3.196E+05	-2.003E+05	4.220E-41	1.255E-31	7.389E-32	-1.014E-31	-3.196E+05	-2.003E+05
1090.00	4.700E+04	8.033E+00	3.776E+05	-3.174E+05	-2.046E+05	7.577E-41	2.257E-31	1.352E-31	-1.807E-31	-3.174E+05	-2.046E+05
1100.00	4.700E+04	8.042E+00	3.780E+05	-3.151E+05	-2.088E+05	1.297E-40	3.868E-31	2.357E-31	-3.067E-31	-3.151E+05	-2.088E+05
1110.00	4.700E+04	8.050E+00	3.784E+05	-3.127E+05	-2.131E+05	2.117E-40	6.321E-31	3.915E-31	-4.962E-31	-3.127E+05	-2.131E+05
1120.00	4.700E+04	8.058E+00	3.787E+05	-3.102E+05	-2.172E+05	3.292E-40	9.843E-31	6.194E-31	-7.649E-31	-3.102E+05	-2.172E+05
1130.00	4.700E+04	8.064E+00	3.790E+05	-3.077E+05	-2.214E+05	4.879E-40	1.461E-30	9.337E-31	-1.123E-30	-3.077E+05	-2.214E+05
1140.00	4.700E+04	8.070E+00	3.793E+05	-3.050E+05	-2.254E+05	6.890E-40	2.065E-30	1.340E-30	-1.571E-30	-3.050E+05	-2.254E+05
1150.00	4.700E+04	8.075E+00	3.795E+05	-3.023E+05	-2.295E+05	9.271E-40	2.782E-30	1.832E-30	-2.093E-30	-3.023E+05	-2.295E+05
1160.00	4.700E+04	8.079E+00	3.797E+05	-2.995E+05	-2.335E+05	1.188E-39	3.570E-30	2.386E-30	-2.655E-30	-2.995E+05	-2.335E+05
1170.00	4.700E+04	8.082E+00	3.799E+05	-2.966E+05	-2.374E+05	1.451E-39	4.364E-30	2.958E-30	-3.208E-30	-2.966E+05	-2.374E+05
1180.00	4.700E+04	8.085E+00	3.800E+05	-2.936E+05	-2.412E+05	1.689E-39	5.081E-30	3.492E-30	-3.691E-30	-2.936E+05	-2.412E+05
1190.00	4.700E+04	8.086E+00	3.801E+05	-2.905E+05	-2.450E+05	1.871E-39	5.636E-30	3.925E-30	-4.044E-30	-2.905E+05	-2.450E+05
1200.00	4.700E+04	8.087E+00	3.801E+05	-2.874E+05	-2.488E+05	1.975E-39	5.954E-30	4.201E-30	-4.218E-30	-2.874E+05	-2.488E+05
1210.00	4.700E+04	8.087E+00	3.801E+05	-2.842E+05	-2.525E+05	1.986E-39	5.990E-30	4.281E-30	-4.190E-30	-2.842E+05	-2.525E+05
1220.00	4.700E+04	8.087E+00	3.801E+05	-2.809E+05	-2.561E+05	1.902E-39	5.741E-30	4.154E-30	-3.962E-30	-2.809E+05	-2.561E+05
1230.00	4.700E+04	8.085E+00	3.800E+05	-2.775E+05	-2.596E+05	1.735E-39	5.241E-30	3.838E-30	-3.568E-30	-2.775E+05	-2.596E+05
1240.00	4.700E+04	8.083E+00	3.799E+05	-2.741E+05	-2.631E+05	1.508E-39	4.556E-30	3.377E-30	-3.059E-30	-2.741E+05	-2.631E+05
1250.00	4.700E+04	8.080E+00	3.797E+05	-2.706E+05	-2.665E+05	1.248E-39	3.774E-30	2.829E-30	-2.497E-30	-2.706E+05	-2.665E+05
1260.00	4.700E+04	8.076E+00	3.796E+05	-2.670E+05	-2.698E+05	9.846E-40	2.977E-30	2.257E-30	-1.941E-30	-2.670E+05	-2.698E+05
1270.00	4.700E+04	8.071E+00	3.793E+05	-2.634E+05	-2.730E+05	7.397E-40	2.237E-30	1.715E-30	-1.437E-30	-2.634E+05	-2.730E+05
1280.00	4.700E+04	8.065E+00	3.791E+05	-2.597E+05	-2.762E+05	5.295E-40	1.602E-30	1.241E-30	-1.013E-30	-2.597E+05	-2.762E+05
1290.00	4.700E+04	8.059E+00	3.788E+05	-2.559E+05	-2.793E+05	3.612E-40	1.093E-30	8.554E-31	-6.804E-31	-2.559E+05	-2.793E+05
1300.00	4.700E+04	8.052E+00	3.784E+05	-2.521E+05	-2.823E+05	2.348E-40	7.105E-31	5.617E-31	-4.351E-31	-2.521E+05	-2.823E+05
1310.00	4.700E+04	8.044E+00	3.781E+05	-2.482E+05	-2.852E+05	1.454E-40	4.402E-31	3.514E-31	-2.651E-31	-2.482E+05	-2.852E+05
1320.00	**4.700E+04**	**8.036E+00**	**3.777E+05**	**-2.443E+05**	**-2.880E+05**	**8.589E-41**	**2.599E-31**	**2.095E-31**	**-1.539E-31**	**-2.443E+05**	**-2.880E+05**
1330.00	4.700E+04	8.026E+00	3.772E+05	-2.403E+05	-2.908E+05	4.835E-41	1.463E-31	1.190E-31	-8.510E-32	-2.403E+05	-2.908E+05
1340.00	4.700E+04	8.016E+00	3.767E+05	-2.363E+05	-2.934E+05	2.595E-41	7.851E-32	6.444E-32	-4.485E-32	-2.363E+05	-2.934E+05
1350.00	4.700E+04	8.005E+00	3.762E+05	-2.322E+05	-2.960E+05	1.328E-41	4.018E-32	3.326E-32	-2.253E-32	-2.322E+05	-2.960E+05
1360.00	4.700E+04	7.993E+00	3.757E+05	-2.281E+05	-2.985E+05	6.484E-42	1.961E-32	1.637E-32	-1.079E-32	-2.281E+05	-2.985E+05
1370.00	4.700E+04	7.981E+00	3.751E+05	-2.239E+05	-3.009E+05	3.019E-42	9.128E-33	7.685E-33	-4.925E-33	-2.239E+05	-3.009E+05
1380.00	4.700E+04	7.968E+00	3.745E+05	-2.197E+05	-3.032E+05	1.342E-42	4.054E-33	3.441E-33	-2.144E-33	-2.197E+05	-3.032E+05

time (s)	a_x (m/s^2)	a_y (m/s^2)	accel (m/s^2)	v_x (m/s)	v_y (m/s)	abs velocity (m/s)	wind velocity (m/s)	x (m)	y (m)	r (m)	altitude (m)	Surface_x (m)	Surface_y (m)
0.00	1.610E+00	0.000E+00	1.61	0.00	464.00	464.00	0.00	6.378E+06	0.000E+00	6.378E+06	0.000E+00	6.378E+06	0.000E+00
10.00	2.231E+00	1.623E-03	2.23	16.10	464.00	464.28	16.10	6.378E+06	4.640E+03	6.378E+06	1.627E+02	6.378E+06	4.640E+03
20.00	2.908E+00	4.231E-03	2.91	38.40	464.02	465.60	38.40	6.379E+06	9.280E+03	6.379E+06	5.517E+02	6.378E+06	9.279E+03
30.00	3.644E+00	7.951E-03	3.64	67.49	464.06	468.94	67.49	6.379E+06	1.392E+04	6.379E+06	1.235E+03	6.378E+06	1.392E+04
40.00	4.444E+00	1.293E-02	4.44	103.93	464.14	475.63	103.93	6.380E+06	1.856E+04	6.380E+06	2.286E+03	6.378E+06	1.856E+04
50.00	5.333E+00	1.939E-02	5.33	148.37	464.27	487.40	148.37	6.382E+06	2.320E+04	6.382E+06	3.785E+03	6.378E+06	2.319E+04
60.00	6.358E+00	2.773E-02	6.36	201.70	464.46	506.37	201.70	6.384E+06	2.785E+04	6.384E+06	5.821E+03	6.378E+06	2.782E+04
70.00	7.592E+00	3.863E-02	7.59	265.28	464.74	535.12	265.28	6.387E+06	3.250E+04	6.387E+06	8.495E+03	6.378E+06	3.245E+04
80.00	9.129E+00	5.307E-02	9.13	341.19	465.12	576.85	341.20	6.390E+06	3.715E+04	6.390E+06	1.193E+04	6.378E+06	3.708E+04
90.00	1.107E+01	7.235E-02	11.07	432.48	465.66	635.51	432.48	6.394E+06	4.180E+04	6.394E+06	1.629E+04	6.378E+06	4.170E+04
100.00	1.350E+01	9.806E-02	13.51	543.15	466.38	715.90	543.15	6.400E+06	4.647E+04	6.400E+06	2.175E+04	6.378E+06	4.631E+04
110.00	1.656E+01	1.322E-01	16.56	678.20	467.36	823.63	678.20	6.406E+06	5.114E+04	6.407E+06	2.857E+04	6.378E+06	5.091E+04
120.00	2.040E+01	1.775E-01	20.40	843.76	468.68	965.19	843.77	6.415E+06	5.583E+04	6.415E+06	3.704E+04	6.378E+06	5.551E+04
130.00	2.537E+01	2.390E-01	25.37	1047.74	470.46	1148.51	1047.76	6.425E+06	6.053E+04	6.426E+06	4.756E+04	6.378E+06	6.009E+04
140.00	3.213E+01	3.257E-01	32.13	1301.43	472.85	1384.67	1301.46	6.438E+06	6.526E+04	6.439E+06	6.062E+04	6.378E+06	6.465E+04
150.00	4.200E+01	4.557E-01	42.01	1622.76	476.10	1691.16	1622.81	6.455E+06	7.002E+04	6.455E+06	7.690E+04	6.378E+06	6.919E+04
160.00	-1.443E+00	-1.667E-02	1.44	2042.79	480.66	2098.58	2042.86	6.475E+06	7.483E+04	6.476E+06	9.738E+04	6.378E+06	7.370E+04
170.00	-1.209E+00	-1.483E-02	1.21	2028.36	480.49	2084.50	2028.43	6.495E+06	7.963E+04	6.496E+06	1.177E+05	6.378E+06	7.819E+04
180.00	-9.697E-01	-1.257E-02	0.97	2016.27	480.35	2072.70	2016.34	6.516E+06	8.444E+04	6.516E+06	1.379E+05	6.378E+06	8.265E+04
190.00	-7.227E-01	-9.868E-03	0.72	2006.57	480.22	2063.24	2006.64	6.536E+06	8.924E+04	6.536E+06	1.581E+05	6.378E+06	8.708E+04
200.00	-4.677E-01	-6.710E-03	0.47	1999.35	480.12	2056.19	1999.41	6.556E+06	9.404E+04	6.556E+06	1.781E+05	6.377E+06	9.149E+04
210.00	-2.041E-01	-3.068E-03	0.20	1994.67	480.05	2051.62	1994.73	6.576E+06	9.884E+04	6.576E+06	1.981E+05	6.377E+06	9.586E+04
220.00	6.893E-02	1.083E-03	0.07	1992.63	480.02	2049.63	1992.69	6.595E+06	1.036E+05	6.596E+06	2.181E+05	6.377E+06	1.002E+05
230.00	3.522E-01	5.774E-03	0.35	1993.32	480.03	2050.30	1993.38	6.615E+06	1.084E+05	6.616E+06	2.381E+05	6.377E+06	1.045E+05
240.00	6.467E-01	1.104E-02	0.65	1996.84	480.09	2053.74	1996.90	6.635E+06	1.132E+05	6.636E+06	2.582E+05	6.377E+06	1.088E+05
250.00	9.532E-01	1.691E-02	0.95	2003.31	480.20	2060.06	2003.37	6.655E+06	1.180E+05	6.656E+06	2.783E+05	6.377E+06	1.131E+05
260.00	**1.273E+00**	**2.343E-02**	**1.27**	**2012.84**	**480.37**	**2069.37**	**2012.91**	**6.676E+06**	**1.228E+05**	**6.677E+06**	**2.985E+05**	**6.377E+06**	**1.174E+05**
270.00	1.601E+00	2.321E-01	1.62	2025.57	480.61	2081.80	2025.64	6.696E+06	1.277E+05	6.697E+06	3.189E+05	6.377E+06	1.216E+05
280.00	1.927E+00	6.594E-01	2.04	2041.58	482.93	2097.92	2041.67	6.716E+06	1.325E+05	6.718E+06	3.394E+05	6.377E+06	1.258E+05
290.00	2.224E+00	1.322E+00	2.59	2060.85	489.52	2118.19	2061.01	6.737E+06	1.374E+05	6.738E+06	3.601E+05	6.377E+06	1.300E+05
300.00	2.454E+00	2.234E+00	3.32	2083.10	502.74	2142.90	2083.46	6.758E+06	1.424E+05	6.759E+06	3.810E+05	6.377E+06	1.344E+05
310.00	2.558E+00	3.405E+00	4.26	2107.63	525.08	2172.06	2108.52	6.779E+06	1.477E+05	6.780E+06	4.022E+05	6.377E+06	1.389E+05
320.00	2.463E+00	4.829E+00	5.42	2133.21	559.13	2205.27	2135.33	6.800E+06	1.532E+05	6.802E+06	4.236E+05	6.377E+06	1.437E+05
330.00	2.077E+00	6.483E+00	6.81	2157.84	607.42	2241.70	2162.60	6.822E+06	1.593E+05	6.823E+06	4.453E+05	6.376E+06	1.489E+05
340.00	1.299E+00	8.313E+00	8.41	2178.61	672.25	2279.97	2188.54	6.843E+06	1.660E+05	6.845E+06	4.673E+05	6.376E+06	1.547E+05
350.00	1.964E-02	1.023E+01	10.23	2191.59	755.37	2318.12	2210.88	6.865E+06	1.736E+05	6.868E+06	4.894E+05	6.376E+06	1.612E+05
360.00	-1.858E+00	1.208E+01	12.22	2191.79	857.64	2353.61	2226.86	6.887E+06	1.822E+05	6.890E+06	5.115E+05	6.376E+06	1.687E+05
370.00	-3.776E+00	1.349E+01	14.01	2173.21	978.46	2383.32	2233.28	6.909E+06	1.920E+05	6.912E+06	5.335E+05	6.376E+06	1.771E+05
380.00	-5.598E+00	1.454E+01	15.58	2135.45	1113.33	2408.25	2231.99	6.930E+06	2.031E+05	6.933E+06	5.552E+05	6.375E+06	1.868E+05
390.00	-7.224E+00	1.535E+01	16.97	2079.47	1258.74	2430.77	2226.17	6.951E+06	2.157E+05	6.954E+06	5.763E+05	6.375E+06	1.978E+05
400.00	-8.585E+00	1.603E+01	18.19	2007.24	1412.25	2454.27	2219.95	6.971E+06	2.298E+05	6.975E+06	5.968E+05	6.375E+06	2.101E+05
410.00	-9.631E+00	1.668E+01	19.26	1921.39	1572.56	2482.88	2218.25	6.990E+06	2.455E+05	6.995E+06	6.166E+05	6.374E+06	2.239E+05
420.00	-1.032E+01	1.738E+01	20.21	1825.08	1739.36	2521.17	2226.53	7.009E+06	2.629E+05	7.014E+06	6.355E+05	6.374E+06	2.391E+05
430.00	-1.059E+01	1.820E+01	21.06	1721.91	1913.17	2573.94	2250.57	7.026E+06	2.821E+05	7.032E+06	6.534E+05	6.373E+06	2.558E+05
440.00	-1.040E+01	1.916E+01	21.80	1615.97	2095.14	2645.94	2296.08	7.042E+06	3.030E+05	7.049E+06	6.704E+05	6.372E+06	2.742E+05
450.00	-9.656E+00	2.028E+01	22.46	1511.97	2286.77	2741.42	2368.24	7.057E+06	3.259E+05	7.065E+06	6.865E+05	6.371E+06	2.942E+05
460.00	-1.055E+01	2.135E+01	23.82	1415.41	2489.56	2863.79	2471.09	7.071E+06	3.508E+05	7.080E+06	7.019E+05	6.370E+06	3.160E+05
470.00	-1.076E+01	2.263E+01	25.06	1309.89	2703.06	3003.73	2594.07	7.084E+06	3.778E+05	7.094E+06	7.163E+05	6.369E+06	3.397E+05
480.00	-1.101E+01	2.408E+01	26.48	1202.28	2929.37	3166.49	2742.90	7.096E+06	4.071E+05	7.108E+06	7.300E+05	6.368E+06	3.653E+05
490.00	-1.131E+01	2.572E+01	28.10	1092.15	3170.14	3352.99	2918.21	7.107E+06	4.388E+05	7.121E+06	7.428E+05	6.366E+06	3.930E+05
500.00	-1.167E+01	2.761E+01	29.98	979.02	3427.36	3564.45	3120.90	7.117E+06	4.731E+05	7.133E+06	7.547E+05	6.364E+06	4.230E+05
510.00	-8.637E+00	5.384E+00	10.18	862.29	3703.48	3802.54	3352.28	7.126E+06	5.101E+05	7.144E+06	7.659E+05	6.362E+06	4.554E+05
520.00	-8.654E+00	5.428E+00	10.22	775.92	3757.32	3836.60	3383.49	7.134E+06	5.477E+05	7.155E+06	7.764E+05	6.359E+06	4.882E+05
530.00	-8.675E+00	5.473E+00	10.26	689.38	3811.60	3873.44	3417.85	7.140E+06	5.858E+05	7.164E+06	7.863E+05	6.357E+06	5.215E+05
540.00	-8.698E+00	5.521E+00	10.30	602.64	3866.33	3913.02	3455.29	7.146E+06	6.245E+05	7.174E+06	7.955E+05	6.354E+06	5.552E+05
550.00	-8.724E+00	5.570E+00	10.35	515.66	3921.54	3955.29	3495.78	7.152E+06	6.637E+05	7.182E+06	8.042E+05	6.351E+06	5.894E+05
560.00	-8.754E+00	5.621E+00	10.40	428.41	3977.23	4000.24	3539.26	7.156E+06	7.034E+05	7.190E+06	8.122E+05	6.348E+06	6.240E+05
570.00	-8.787E+00	5.674E+00	10.46	340.87	4033.44	4047.82	3585.68	7.159E+06	7.438E+05	7.198E+06	8.197E+05	6.344E+06	6.591E+05
580.00	-8.822E+00	5.730E+00	10.52	253.01	4090.19	4098.00	3635.00	7.162E+06	7.847E+05	7.205E+06	8.266E+05	6.340E+06	6.947E+05
590.00	-8.861E+00	5.787E+00	10.58	164.78	4147.48	4150.75	3687.17	7.163E+06	8.262E+05	7.211E+06	8.328E+05	6.336E+06	7.307E+05
600.00	-8.904E+00	5.847E+00	10.65	76.17	4205.36	4206.05	3742.13	7.164E+06	8.682E+05	7.217E+06	8.385E+05	6.332E+06	7.673E+05
610.00	-8.950E+00	5.910E+00	10.72	-12.87	4263.83	4263.85	3799.85	7.164E+06	9.108E+05	7.222E+06	8.436E+05	6.327E+06	8.044E+05
620.00	-8.999E+00	5.975E+00	10.80	-102.37	4322.93	4324.14	3860.28	7.163E+06	9.541E+05	7.226E+06	8.482E+05	6.322E+06	8.421E+05
630.00	-9.052E+00	6.042E+00	10.88	-192.36	4382.67	4386.89	3923.39	7.161E+06	9.979E+05	7.230E+06	8.522E+05	6.317E+06	8.803E+05
640.00	-9.109E+00	6.113E+00	10.97	-282.88	4443.10	4452.10	3989.14	7.158E+06	1.042E+06	7.234E+06	8.557E+05	6.312E+06	9.190E+05
650.00	-9.170E+00	6.187E+00	11.06	-373.98	4504.23	4519.73	4057.50	7.155E+06	1.087E+06	7.237E+06	8.586E+05	6.306E+06	9.584E+05
660.00	-9.235E+00	6.263E+00	11.16	-465.68	4566.09	4589.78	4128.44	7.150E+06	1.133E+06	7.239E+06	8.610E+05	6.300E+06	9.983E+05
670.00	-9.304E+00	6.343E+00	11.26	-558.03	4628.73	4662.24	4201.94	7.144E+06	1.179E+06	7.241E+06	8.629E+05	6.293E+06	1.039E+06
680.00	-9.378E+00	6.426E+00	11.37	-651.08	4692.16	4737.11	4277.99	7.138E+06	1.226E+06	7.242E+06	8.643E+05	6.286E+06	1.080E+06
690.00	-9.456E+00	6.513E+00	11.48	-744.86	4756.42	4814.39	4356.57	7.130E+06	1.274E+06	7.243E+06	8.651E+05	6.279E+06	1.122E+06
700.00	-9.539E+00	6.604E+00	11.60	-839.42	4821.55	4894.08	4437.67	7.122E+06	1.322E+06	7.244E+06	8.655E+05	6.271E+06	1.164E+06
710.00	-9.627E+00	6.699E+00	11.73	-934.81	4887.60	4976.19	4521.29	7.113E+06	1.371E+06	7.244E+06	8.654E+05	6.263E+06	1.207E+06
720.00	-9.721E+00	6.799E+00	11.86	-1031.09	4954.59	5060.74	4607.45	7.102E+06	1.420E+06	7.243E+06	8.649E+05	6.254E+06	1.251E+06
730.00	-9.820E+00	6.903E+00	12.00	-1128.30	5022.58	5147.75	4696.14	7.091E+06	1.471E+06	7.242E+06	8.638E+05	6.245E+06	1.295E+06
740.00	-9.925E+00	7.012E+00	12.15	-1226.50	5091.61	5237.25	4787.38	7.079E+06	1.522E+06	7.240E+06	8.623E+05	6.236E+06	1.340E+06
750.00	-1.004E+01	7.126E+00	12.31	-1325.75	5161.73	5329.26	4881.21	7.066E+06	1.573E+06	7.239E+06	8.604E+05	6.226E+06	1.386E+06
760.00	-1.015E+01	7.246E+00	12.47	-1426.11	5232.99	5423.83	4977.65	7.051E+06	1.626E+06	7.236E+06	8.581E+05	6.215E+06	1.433E+06
770.00	-1.028E+01	7.372E+00	12.65	-1527.65	5305.45	5521.00	5076.74	7.036E+06	1.679E+06	7.233E+06	8.553E+05	6.204E+06	1.480E+06
780.00	-1.041E+01	7.504E+00	12.83	-1630.44	5379.16	5620.83	5178.53	7.020E+06	1.732E+06	7.230E+06	8.522E+05	6.192E+06	1.528E+06
790.00	**-1.055E+01**	**7.643E+00**	**13.03**	**-1734.55**	**5454.21**	**5723.38**	**5283.07**	**7.002E+06**	**1.787E+06**	**7.227E+06**	**8.486E+05**	**6.180E+06**	**1.577E+06**
800.00	-1.070E+01	7.790E+00	13.24	-1840.07	5530.64	5828.71	5390.43	6.984E+06	1.842E+06	7.223E+06	8.447E+05	6.167E+06	1.627E+06
810.00	-1.086E+01	7.945E+00	13.45	-1947.07	5608.54	5936.90	5500.67	6.964E+06	1.898E+06	7.219E+06	8.404E+05	6.154E+06	1.677E+06
820.00	-1.103E+01	8.108E+00	13.69	-2055.65	5687.99	6048.05	5613.89	6.944E+06	1.955E+06	7.214E+06	8.358E+05	6.139E+06	1.729E+06
830.00	-1.120E+01	8.281E+00	13.93	-2165.91	5769.07	6162.25	5730.18	6.922E+06	2.013E+06	7.209E+06	8.308E+05	6.124E+06	1.781E+06
840.00	-1.139E+01	8.464E+00	14.19	-2277.94	5851.89	6279.62	5849.64	6.899E+06	2.071E+06	7.204E+06	8.256E+05	6.109E+06	1.834E+06
850.00	-1.160E+01	8.658E+00	14.47	-2391.88	5936.52	6400.27	5972.40	6.876E+06	2.131E+06	7.198E+06	8.200E+05	6.092E+06	1.888E+06
860.00	-1.181E+01	8.864E+00	14.77	-2507.83	6023.10	6524.34	6098.59	6.850E+06	2.191E+06	7.192E+06	8.142E+05	6.075E+06	1.943E+06
870.00	-1.204E+01	9.083E+00	15.08	-2625.93	6111.74	6651.98	6228.36	6.824E+06	2.252E+06	7.186E+06	8.081E+05	6.057E+06	1.999E+06
880.00	-1.229E+01	9.316E+00	15.42	-2746.33	6202.57	6783.38	6361.88	6.797E+06	2.314E+06	7.180E+06	8.018E+05	6.038E+06	2.056E+06
890.00	-1.255E+01	9.565E+00	15.78	-2869.18	6295.73	6918.70	6499.33	6.768E+06	2.377E+06	7.173E+06	7.952E+05	6.018E+06	2.114E+06
900.00	-1.283E+01	9.831E+00	16.16	-2994.66	6391.38	7058.17	6640.92	6.738E+06	2.441E+06	7.167E+06	7.885E+05	5.997E+06	2.172E+06
910.00	-1.313E+01	1.012E+01	16.58	-3122.96	6489.69	7202.01	6786.88	6.707E+06	2.506E+06	7.160E+06	7.816E+05	5.975E+06	2.232E+06
920.00	-1.346E+01	1.042E+01	17.02	-3254.28	6590.85	7350.49	6937.48	6.674E+06	2.572E+06	7.153E+06	7.746E+05	5.952E+06	2.293E+06
930.00	-1.381E+01	1.075E+01	17.50	-3388.87	6695.08	7503.90	7093.01	6.640E+06	2.639E+06	7.146E+06	7.674E+05	5.927E+06	2.355E+06
940.00	-1.419E+01	1.111E+01	18.02	-3526.97	6802.59	7662.56	7253.78	6.605E+06	2.707E+06	7.138E+06	7.602E+05	5.902E+06	2.419E+06
950.00	-1.460E+01	1.149E+01	18.58	-3668.88	6913.67	7826.84	7420.17	6.569E+06	2.776E+06	7.131E+06	7.529E+05	5.875E+06	2.483E+06
960.00	-1.505E+01	1.191E+01	19.19	-3814.91	7028.59	7997.16	7592.58	6.530E+06	2.846E+06	7.124E+06	7.455E+05	5.847E+06	2.548E+06
970.00	-1.554E+01	1.236E+01	19.86	-3965.42	7147.68	8173.98	7771.49	6.491E+06	2.918E+06	7.116E+06	7.382E+05	5.817E+06	2.615E+06
980.00	-1.608E+01	1.286E+01	20.59	-4120.84	7271.30	8357.82	7957.43	6.449E+06	2.990E+06	7.109E+06	7.309E+05	5.786E+06	2.683E+06
990.00	-1.667E+01	1.340E+01	21.39	-4281.61	7399.88	8549.30	8150.99	6.407E+06	3.064E+06	7.102E+06	7.237E+05	5.754E+06	2.752E+06
1000.00	-1.732E+01	1.400E+01	22.27	-4448.28	7533.89	8749.10	8352.87	6.362E+06	3.140E+06	7.095E+06	7.166E+05	5.720E+06	2.823E+06
1010.00	-7.072E+00	-3.601E+00	7.94	-4621.44	7673.87	8958.01	8563.87	6.316E+06	3.216E+06	7.088E+06	7.097E+05	5.684E+06	2.894E+06
1020.00	-7.039E+00	-3.697E+00	7.95	-4692.15	7637.85	8963.99	8572.08	6.269E+06	3.293E+06	7.081E+06	7.031E+05	5.647E+06	2.966E+06
1030.00	-7.004E+00	-3.792E+00	7.96	-4762.54	7600.88	8969.68	8580.03	6.221E+06	3.369E+06	7.075E+06	6.969E+05	5.609E+06	3.037E+06
1040.00	-6.967E+00	-3.887E+00	7.98	-4832.58	7562.96	8975.09	8587.73	6.173E+06	3.445E+06	7.069E+06	6.909E+05	5.570E+06	3.108E+06
1050.00	-6.928E+00	-3.982E+00	7.99	-4902.24	7524.09	8980.19	8595.16	6.124E+06	3.520E+06	7.064E+06	6.854E+05	5.530E+06	3.178E+06
1060.00	-6.887E+00	-4.075E+00	8.00	-4971.52	7484.27	8985.01	8602.34	6.074E+06	3.595E+06	7.058E+06	6.801E+05	5.489E+06	3.248E+06
1070.00	-6.844E+00	-4.168E+00	8.01	-5040.39	7443.52	8989.52	8609.25	6.024E+06	3.669E+06	7.053E+06	6.752E+05	5.447E+06	3.318E+06
1080.00	-6.799E+00	-4.261E+00	8.02	-5108.83	7401.83	8993.73	8615.90	5.973E+06	3.743E+06	7.049E+06	6.707E+05	5.405E+06	3.387E+06
1090.00	-6.752E+00	-4.352E+00	8.03	-5176.82	7359.22	8997.65	8622.27	5.921E+06	3.817E+06	7.045E+06	6.665E+05	5.361E+06	3.456E+06
1100.00	-6.704E+00	-4.443E+00	8.04	-5244.34	7315.70	9001.26	8628.38	5.869E+06	3.890E+06	7.041E+06	6.626E+05	5.316E+06	3.524E+06
1110.00	-6.653E+00	-4.533E+00	8.05	-5311.38	7271.27	9004.56	8634.21	5.816E+06	3.963E+06	7.037E+06	6.591E+05	5.271E+06	3.591E+06
1120.00	-6.600E+00	-4.622E+00	8.06	-5377.91	7225.94	9007.56	8639.77	5.762E+06	4.035E+06	7.034E+06	6.559E+05	5.225E+06	3.659E+06
1130.00	-6.546E+00	-4.710E+00	8.06	-5443.91	7179.72	9010.25	8645.06	5.707E+06	4.107E+06	7.031E+06	6.530E+05	5.177E+06	3.725E+06
1140.00	-6.489E+00	-4.797E+00	8.07	-5509.37	7132.62	9012.62	8650.07	5.652E+06	4.178E+06	7.029E+06	6.506E+05	5.129E+06	3.791E+06
1150.00	-6.431E+00	-4.883E+00	8.07	-5574.26	7084.65	9014.69	8654.79	5.596E+06	4.249E+06	7.027E+06	6.484E+05	5.080E+06	3.857E+06
1160.00	-6.371E+00	-4.967E+00	8.08	-5638.58	7035.83	9016.45	8659.24	5.540E+06	4.319E+06	7.025E+06	6.466E+05	5.030E+06	3.922E+06
1170.00	-6.310E+00	-5.051E+00	8.08	-5702.29	6986.16	9017.90	8663.41	5.483E+06	4.389E+06	7.023E+06	6.452E+05	4.979E+06	3.986E+06
1180.00	-6.246E+00	-5.133E+00	8.08	-5765.39	6935.65	9019.03	8667.29	5.425E+06	4.458E+06	7.022E+06	6.441E+05	4.928E+06	4.049E+06
1190.00	-6.181E+00	-5.214E+00	8.09	-5827.85	6884.32	9019.85	8670.89	5.367E+06	4.527E+06	7.022E+06	6.434E+05	4.875E+06	4.112E+06
1200.00	-6.114E+00	-5.293E+00	8.09	-5889.66	6832.18	9020.36	8674.21	5.308E+06	4.595E+06	7.021E+06	6.430E+05	4.822E+06	4.175E+06
1210.00	-6.046E+00	-5.371E+00	8.09	-5950.80	6779.25	9020.55	8677.24	5.249E+06	4.663E+06	7.021E+06	6.429E+05	4.768E+06	4.236E+06
1220.00	-5.976E+00	-5.448E+00	8.09	-6011.26	6725.54	9020.43	8679.98	5.189E+06	4.731E+06	7.021E+06	6.432E+05	4.713E+06	4.297E+06
1230.00	-5.904E+00	-5.523E+00	8.09	-6071.02	6671.05	9019.99	8682.44	5.128E+06	4.797E+06	7.022E+06	6.439E+05	4.658E+06	4.357E+06
1240.00	-5.831E+00	-5.597E+00	8.08	-6130.06	6615.82	9019.24	8684.62	5.067E+06	4.863E+06	7.023E+06	6.449E+05	4.601E+06	4.417E+06
1250.00	-5.757E+00	-5.669E+00	8.08	-6188.38	6559.85	9018.18	8686.50	5.005E+06	4.929E+06	7.024E+06	6.463E+05	4.544E+06	4.475E+06
1260.00	-5.681E+00	-5.740E+00	8.08	-6245.94	6503.15	9016.81	8688.10	4.942E+06	4.994E+06	7.026E+06	6.480E+05	4.486E+06	4.533E+06
1270.00	-5.603E+00	-5.809E+00	8.07	-6302.75	6445.75	9015.12	8689.42	4.879E+06	5.058E+06	7.028E+06	6.500E+05	4.428E+06	4.591E+06
1280.00	-5.525E+00	-5.876E+00	8.07	-6358.78	6387.66	9013.12	8690.45	4.816E+06	5.122E+06	7.031E+06	6.525E+05	4.369E+06	4.647E+06
1290.00	-5.445E+00	-5.942E+00	8.06	-6414.02	6328.90	9010.81	8691.19	4.752E+06	5.186E+06	7.033E+06	6.552E+05	4.309E+06	4.703E+06
1300.00	-5.363E+00	-6.006E+00	8.05	-6468.47	6269.48	9008.19	8691.64	4.687E+06	5.248E+06	7.036E+06	6.583E+05	4.248E+06	4.757E+06
1310.00	-5.281E+00	-6.068E+00	8.04	-6522.10	6209.42	9005.26	8691.82	4.622E+06	5.310E+06	7.040E+06	6.618E+05	4.187E+06	4.811E+06
1320.00	**-5.197E+00**	**-6.128E+00**	**8.04**	**-6574.91**	**6148.74**	**9002.03**	**8691.71**	**4.556E+06**	**5.372E+06**	**7.044E+06**	**6.656E+05**	**4.125E+06**	**4.864E+06**
1330.00	-5.113E+00	-6.187E+00	8.03	-6626.89	6087.46	8998.49	8691.31	4.490E+06	5.433E+06	7.048E+06	6.697E+05	4.063E+06	4.917E+06
1340.00	-5.027E+00	-6.244E+00	8.02	-6678.01	6025.59	8994.64	8690.63	4.423E+06	5.493E+06	7.052E+06	6.742E+05	4.000E+06	4.968E+06
1350.00	-4.941E+00	-6.298E+00	8.00	-6728.29	5963.15	8990.50	8689.68	4.356E+06	5.553E+06	7.057E+06	6.790E+05	3.936E+06	5.018E+06
1360.00	-4.853E+00	-6.351E+00	7.99	-6777.69	5900.17	8986.05	8688.44	4.288E+06	5.612E+06	7.062E+06	6.842E+05	3.872E+06	5.068E+06
1370.00	-4.765E+00	-6.402E+00	7.98	-6826.22	5836.65	8981.30	8686.93	4.220E+06	5.670E+06	7.068E+06	6.897E+05	3.808E+06	5.117E+06
1380.00	-4.675E+00	-6.452E+00	7.97	-6873.87	5772.63	8976.26	8685.14	4.151E+06	5.728E+06	7.074E+06	6.955E+05	3.743E+06	5.165E+06