

Time (μs)	Trough_radius (mm)	Crest_radius (mm)
158.9	176.78744	178.23473
178.9	174.73718	176.31289
198.9	172.52449	174.22267
218.9	170.43094	172.26374
238.9	168.12895	170.08596
258.9	166.04452	168.1343
278.9	163.80438	166.01999
298.9	161.55332	163.89615
318.9	159.12313	161.60472
338.9	156.89391	159.51809
358.9	154.90781	157.65218
378.9	152.5736	155.44736
398.9	150.52546	153.52389
418.9	148.38812	151.51945
438.9	146.30523	149.56741
458.9	143.97272	147.3721
478.9	141.9626	145.47544
498.9	139.64728	143.28729
518.9	137.74592	141.48685
538.9	135.67318	139.52761
558.9	133.65935	137.63561
578.9	131.4598	135.57517
598.9	129.6011	133.83865
618.9	127.35392	131.68689
638.9	125.48217	129.92669
658.9	123.40172	127.93393
678.9	121.66619	126.28774
698.9	119.79865	124.50705
718.9	117.62498	122.42631
738.9	115.83667	120.72532
758.9	113.6517	118.60598
778.9	112.09217	117.10018
798.9	110.46101	115.50061
818.9	108.58214	113.63314
838.9	106.91095	111.9611
858.9	105.20079	110.25423
878.9	103.65793	108.70655
898.9	101.84663	106.87314
918.9	100.39826	105.40546
938.9	99.01728	103.96006
958.9	97.25818	102.12565
978.9	96.09443	100.85664
998.9	94.64483	99.25354
1018.9	93.15857	97.61924
1038.9	92.22487	96.4982
1058.9	90.71218	94.76512
1078.9	89.70854	93.49973
1098.9	88.27892	91.76748
1118.9	87.73638	90.90775
1138.9	86.76832	89.58804
1158.9	86.17009	88.53044
1178.9	84.96087	86.86726
1198.9	84.18551	85.59337

1218.9	83.56045	84.44251
1238.9	82.81386	83.2056
1258.9	82.57443	82.5264
1278.9	82.30434	81.73638
1298.9	81.90934	80.92842
1318.9	82.14828	80.66848

Mean radius for reference (mm)	Data fitting is adopted to acquire effective velocity and acceleration	Fitting time ( $\mu$ s)	Fitting velocity (m/s)
177.511085		150.81919	-104.61281
175.525035		162.73838	-104.85607
173.37358		174.65758	-105.07421
171.34734		186.57677	-105.27561
169.107455		198.49596	-105.45599
167.08941		210.41515	-105.6112
164.912185		222.33434	-105.75379
162.724735		234.25354	-105.87124
160.363925		246.17273	-105.96358
158.206		258.09192	-106.03908
156.279995		270.01111	-106.09362
154.01048		281.9303	-106.12718
152.024675		293.84949	-106.14391
149.953785		305.76869	-106.13552
147.93632		317.68788	-106.1062
145.67241		329.60707	-106.05586
143.71902		341.52626	-105.98455
141.467285		353.44545	-105.89222
139.616385		365.36465	-105.78315
137.600395		377.28384	-105.65315
135.64748		389.20303	-105.49375
133.517485		401.12222	-105.32175
131.719875		413.04141	-105.12874
129.520405		424.96061	-104.91061
127.70443		436.8798	-104.67154
125.667825		448.79899	-104.41565
123.976965		460.71818	-104.13879
122.15285		472.63737	-103.84091
120.025645		484.55657	-103.52209
118.280995		496.47576	-103.17815
116.12884		508.39495	-102.81739
114.596175		520.31414	-102.43565
112.98081		532.23333	-102.0287
111.10764		544.15253	-101.60502
109.436025		556.07172	-101.16459
107.72751		567.99091	-100.69896
106.18224		579.9101	-100.21235
104.359885		591.82929	-99.70476
102.90186		603.74848	-99.17197
101.48867		615.66768	-98.62663
99.691915		627.58687	-98.06035
98.475535		639.50606	-97.46468
96.949185		651.42525	-96.85641
95.388905		663.34444	-96.22294
94.361535		675.26364	-95.56853
92.73865		687.18283	-94.89739
91.604135		699.10202	-94.20103
90.0232		711.02121	-93.4879
89.322065		722.9404	-92.75375
88.17818		734.8596	-91.99447
87.350265		746.77879	-91.21425
85.914065		758.69798	-90.41722
84.88944		770.61717	-89.59921

84.00148	782.53636	-88.76019
83.00973	794.45556	-87.89604
82.550415	806.37475	-87.01514
82.02036	818.29394	-86.11323
81.41888	830.21313	-85.19035
81.40838	842.13232	-84.24646
	854.05152	-83.28163
	865.97071	-82.29586
	877.8899	-81.28489
	889.80909	-80.26133
	901.72828	-79.2126
	913.64747	-78.14286
	925.56667	-77.05638
	937.48586	-75.94476
	949.40505	-74.80961
	961.32424	-73.65769
	973.24343	-72.48686
	985.16263	-71.29257
	997.08182	-70.07817
	1009.00101	-68.84277
	1020.9202	-67.58639
	1032.83939	-66.30943
	1044.75859	-65.01152
	1056.67778	-63.69267
	1068.59697	-62.35323
	1080.51616	-60.99324
	1092.43535	-59.61183
	1104.35455	-58.20989
	1116.27374	-56.78742
	1128.19293	-55.34353
	1140.11212	-53.87908
	1152.03131	-52.39448
	1163.95051	-50.8885
	1175.8697	-49.36116
	1187.78889	-47.81365
	1199.70808	-46.24559
	1211.62727	-44.65656
	1223.54646	-43.04653
	1235.46566	-41.41513
	1247.38485	-39.76361
	1259.30404	-38.09151
	1271.22323	-36.39845
	1283.14242	-34.68439
	1295.06162	-32.94937
	1306.98081	-31.19381

Fitting acceleration (m/s^2)	Amplitude (mm)	error bar (mm)
	0.72364	0.13733
-19355.19448	0.78786	0.13988
-17599.15746	0.84909	0.13708
-16015.40991	0.9164	0.13696
-14077.85573	0.9785	0.14249
-12492.23597	1.04489	0.14643
-10908.47056	1.1078	0.1449
-8800.51712	1.17141	0.14297
-7040.790913	1.24079	0.14658
-5455.169094	1.31209	0.15156
-3695.437128	1.37219	0.15018
-2109.81051	1.43688	0.15346
-350.0785456	1.49921	0.15628
1581.890257	1.56566	0.15486
3341.623034	1.63109	0.15955
5103.222701	1.69969	0.16131
6864.818086	1.75642	0.16286
8448.571391	1.82001	0.16141
10028.60458	1.87046	0.16396
12140.28906	1.92721	0.16351
13901.88253	1.98813	0.16406
15311.51809	2.05768	0.16562
17247.21217	2.11877	0.16517
19179.2204	2.16648	0.16472
20762.99105	2.22226	0.16627
22348.59596	2.26611	0.16682
24110.15525	2.31078	0.16537
25869.87076	2.3542	0.16792
27801.92607	2.40067	0.16847
29561.67531	2.44432	0.16902
31147.25579	2.47714	0.16857
33084.75639	2.50401	0.17012
34844.46628	2.5198	0.17068
36248.66786	2.5255	0.17223
38008.42248	2.52508	0.17178
39945.91562	2.52672	0.17233
41705.64759	2.52431	0.17388
43643.09791	2.51326	0.17443
45226.82811	2.5036	0.17398
46631.13237	2.47139	0.17453
48742.83989	2.43374	0.17608
50504.30742	2.3811	0.17563
52089.75945	2.30436	0.17619
54025.43043	2.23034	0.17674
55605.81352	2.13667	0.17729
57365.58033	2.02647	0.17884
59126.99405	1.8956	0.17839
60712.38503	1.74428	0.17994
62648.05056	1.58568	0.17949
64580.50383	1.40986	0.18104
66164.30305	1.18017	0.18059
67749.68068	0.95319	0.17814
69510.97459	0.70393	0.18169

71446.63457	0.44103	0.18125
73203.25712	0.19587	0.1828
74787.06181	-0.02401	0.18235
76548.34051	-0.28398	0.1849
78309.55499	-0.49046	0.18445
80069.23639	-0.7399	0.18522
81826.01957		
83761.77603		
85347.00034		
86930.75911		
88867.83937		
90451.54108		
92208.54122		
94249.8881		
95940.58677		
97437.63452		
99214.90117		
101042.4915		
102767.0922		
104528.0788		
106271.3803		
108013.4468		
109770.8671		
111513.0706		
113238.752		
114999.533		
116759.1913		
118481.6545		
120241.4609		
122002.2172		
123710.0792		
125452.1347		
127245.2431		
128987.4576		
130695.2931		
132437.4277		
134197.9172		
135975.1607		
137715.8084		
139422.8348		
141165.6983		
142926.0406		
144685.6813		
146426.6251		