

Time (μs)	Trough_radius (mm)	Crest_radius (mm)
134.6	178.7975108	181.9805457
154.6	176.6711196	180.1695677
174.6	174.3475551	178.0191237
194.6	172.3023351	176.2402492
214.6	170.1085652	174.2457058
234.6	168.0245578	172.3559409
254.6	165.9411092	170.5585033
274.6	163.5639937	168.4219008
294.6	161.542842	166.5485465
314.6	159.5246615	164.7693726
334.6	157.2684002	162.7873749
354.6	155.1711612	161.0082707
374.6	153.0362186	159.1092593
394.6	151.0106489	157.3208927
414.6	148.9211162	155.4311479
434.6	146.6840536	153.5321731
454.6	144.5734797	151.6282839
474.6	142.4329588	149.7434557
494.6	140.4978902	147.9551431
514.6	138.3441039	145.9547409
534.6	136.5909475	144.3786336
554.6	134.4744091	142.5070864
574.6	132.5582419	140.7143022
594.6	130.7330297	139.046081
614.6	128.428651	137.0260102
634.6	126.7003034	135.4385048
654.6	124.7557107	133.7099171
674.6	122.8091971	131.8311109
694.6	120.9823423	130.1841576
714.6	118.8279078	128.2845121
734.6	117.0806914	126.6164992
754.6	115.2737048	124.9378366
774.6	113.2685203	123.1487057
794.6	111.3726472	121.4389989
814.6	109.7435705	120.0021576
834.6	107.979277	118.3236912
854.6	105.9879123	116.4448756
874.6	104.6416589	115.1981334
894.6	102.9588042	113.5402846
914.6	101.0163025	111.7512698
934.6	99.60150563	110.4146848
954.6	97.72307369	108.6464899
974.6	96.46313407	107.3205138
994.6	94.81104508	105.5420212
1014.6	93.60993466	104.3053211
1034.6	91.81340618	102.4453493
1054.6	90.48257534	101.0708323
1074.6	89.11274496	99.57034762
1094.6	87.82144422	98.00392173
1114.6	87.10680494	97.2093665
1134.6	85.35102633	95.33911826
1154.6	84.18771683	93.8750988
1174.6	82.99750081	92.42780138

1194.6	82.29131733	91.45709205
1214.6	81.29994227	90.20563422
1234.6	80.54911631	88.98805731
1254.6	79.72750058	87.87281328
1274.6	79.18440941	86.75757754
1294.6	78.4140856	85.62603726
1314.6	77.77649941	84.61372111
1334.6	77.63589076	83.8231607
1354.6	77.26401599	82.81888881
1374.6	76.88077558	81.89669716
1394.6	77.33905195	81.01039633
1414.6	78.24932197	80.33876477
1434.6	79.2446247	79.57023696
1454.6	82.31373667	81.22416359
1474.6	85.93399003	83.29913646
1494.6	84.92259725	80.5974283
1514.6	86.86870504	80.61192276
1534.6	88.25831282	80.64724176

Mean radius for reference (mm)	Data fitting is adopted to acquire effective velocity and acceleration	Fitting time ( $\mu$ s)	Fitting velocity (m/s)
180.3890283		147.12525	-97.74252101
178.4203437		159.65051	-98.00039999
176.1833394		172.17576	-98.23995529
174.2712922		184.70101	-98.46070937
172.1771355		197.22626	-98.66346034
170.1902493		209.75152	-98.84788773
168.2498063		222.27677	-99.01359254
165.9929473		234.80202	-99.16129419
164.0456943		247.32727	-99.29099248
162.1470171		259.85253	-99.40156907
160.0278875		272.37778	-99.49382248
158.089716		284.90303	-99.56847169
156.0727389		297.42828	-99.62391983
154.1657708		309.95354	-99.66144402
152.176132		322.47879	-99.6806451
150.1081133		335.00404	-99.68144348
148.1008818		347.52929	-99.66383918
146.0882073		360.05455	-99.62751257
144.2265166		372.5798	-99.57326201
142.1494224		385.10505	-99.50060877
140.4847906		397.6303	-99.40955294
138.4907478		410.15556	-99.30017393
136.636272		422.68081	-99.17247161
134.8895553		435.20606	-99.02636674
132.7273306		447.73131	-98.8618595
131.0694041		460.25657	-98.67902889
129.2328139		472.78182	-98.47787469
127.320154		485.30707	-98.257919
125.5832499		497.83232	-98.01996047
123.5562099		510.35758	-97.76367826
121.8485953		522.88283	-97.48907207
120.1057707		535.40808	-97.19646314
118.208613		547.93333	-96.88505344
116.4058231		560.45859	-96.55492044
114.8728641		572.98384	-96.20686214
113.1514841		585.50909	-95.84040239
111.216394		598.03434	-95.45554162
109.9198962		610.5596	-95.05235622
108.2495444		623.08485	-94.63084569
106.3837862		635.6101	-94.19133351
105.0080952		648.13535	-93.7330218
103.1847818		660.66061	-93.25598561
101.8918239		673.18586	-92.76102273
100.1765331		685.71111	-92.24805892
98.95762789		698.23636	-91.71629639
97.12937773		710.76162	-91.1658086
95.77670382		723.28687	-90.59779246
94.34154629		735.81212	-90.01097782
92.91268297		748.33737	-89.40576459
92.15808572		760.86263	-88.78222439
90.3450723		773.38788	-88.14035648
89.03140782		785.91313	-87.48048941
87.71265109		798.43838	-86.8014264

86.87420469	810.96364	-86.10483379
85.75278824	823.48889	-85.38951318
84.76858681	836.01414	-84.65579529
83.80015693	848.53939	-83.903681
82.97099347	861.06465	-83.13323761
82.02006143	873.5899	-82.34486338
81.19511026	886.11515	-81.53769386
80.72952573	898.6404	-80.71212921
80.0414524	911.16566	-79.86823422
79.38873637	923.69091	-79.00600786
79.17472414	936.21616	-78.12538672
79.29404337	948.74141	-77.22677103
79.40743083	961.26667	-76.30982363
81.76895013	973.79192	-75.37414423
84.61656324	986.31717	-74.41967226
82.76001277	998.84242	-73.44720726
83.7403139	1011.36768	-72.45680826
84.45277729	1023.89293	-71.44807489
	1036.41818	-70.42055049
	1048.94343	-69.37463549
	1061.46869	-68.31078489
	1073.99394	-67.22819904
	1086.51919	-66.12722301
	1099.04444	-65.00785812
	1111.5697	-63.87015674
	1124.09495	-62.71451668
	1136.6202	-61.54048821
	1149.14545	-60.34767356
	1161.67071	-59.13652057
	1174.19596	-57.907427
	1186.72121	-56.65954771
	1199.24646	-55.39328341
	1211.77172	-54.10907802
	1224.29697	-52.80613161
	1236.82222	-51.4848007
	1249.34747	-50.14548606
	1261.87273	-48.78782907
	1274.39798	-47.41142891
	1286.92323	-46.01664637
	1299.44848	-44.60388232
	1311.97374	-43.17277373
	1324.49899	-41.7229197
	1337.02424	-40.25468554
	1349.54949	-38.76847218
	1362.07475	-37.2635128

Fitting acceleration (m/s <sup>2</sup> )	Amplitude (mm)	error bar (mm)
	1.59152	0.14571
-19857.2516	1.74922	0.14371
-18375.25699	1.83578	0.14643
-16906.05195	1.96896	0.14814
-15455.90731	2.06857	0.14286
-13977.0487	2.16569	0.15357
-12510.98613	2.3087	0.14929
-11073.6287	2.42895	0.15213
-9591.616462	2.50285	0.15071
-8096.841134	2.62236	0.15143
-6662.646148	2.75949	0.15214
-5193.403476	2.91855	0.15386
-3711.394751	3.03652	0.15057
-2264.435516	3.15512	0.15429
-798.3659271	3.25502	0.15521
670.8815226	3.42406	0.15571
2152.88673	3.5274	0.15543
3615.781419	3.65525	0.15814
5065.918976	3.72863	0.15786
6535.161833	3.80532	0.15357
8001.227987	3.89384	0.15629
9464.131943	4.01634	0.16213
10930.20856	4.07803	0.16171
12399.43747	4.15653	0.16143
13865.50011	4.29868	0.16314
15328.42269	4.3691	0.16486
16810.43837	4.4771	0.16357
18279.64397	4.51096	0.16429
19729.76754	4.60091	0.16225
21192.71813	4.7283	0.16571
22642.86621	4.7679	0.16643
24112.03914	4.83207	0.16614
25609.96585	4.94009	0.16586
27072.95379	5.03318	0.16857
28523.10539	5.12929	0.16929
29992.23627	5.17221	0.17233
31458.28838	5.22848	0.17071
32921.32304	5.27824	0.17343
34371.47814	5.29074	0.17214
35840.55763	5.36748	0.17486
37338.47733	5.40659	0.17357
38801.56806	5.46171	0.17429
40235.79113	5.42869	0.17522
41704.80986	5.36549	0.17671
43202.72604	5.34769	0.17643
44649.94667	5.31597	0.17514
46100.1088	5.29413	0.17486
47584.99295	5.2288	0.17557
49051.03453	5.09124	0.18129
50514.26551	5.05128	0.18002
51964.43115	4.99405	0.18071
53449.23582	4.84369	0.18143
54915.27388	4.71515	0.18214

56362.65348	4.58289	0.18286
57844.69373	4.45285	0.18457
59313.474	4.21947	0.18429
60779.50855	4.07266	0.18221
62226.98168	3.78658	0.18571
63693.08989	3.60598	0.18743
65177.7075	3.41861	0.19214
66643.73854	3.09363	0.19186
68107.25011	2.77744	0.18857
69573.36184	2.50796	0.18929
71026.00077	1.83567	0.19003
72476.09276	1.04472	0.19171
73955.65213	0.16281	0.19243
75453.63846	-0.54479	0.19214
76922.09601	-1.31743	0.19386
78356.24893	-2.16258	0.19357
79804.05883	-3.12839	0.19629
81286.11311	-3.80554	0.19556
82770.37992		
84220.46488		
85684.3413		
87166.3991		
88634.5947		
90100.61169		
91548.69291		
92998.88312		
94482.86924		
95964.81828		
97413.04919		
98879.17847		
100363.0102		
101813.0846		
103277.4102		
104759.4785		
106211.2754		
107661.3463		
109141.7758		
110623.8477		
112075.4714		
113525.5389		
115006.1461		
116488.2215		
117939.6628		
119405.6623		