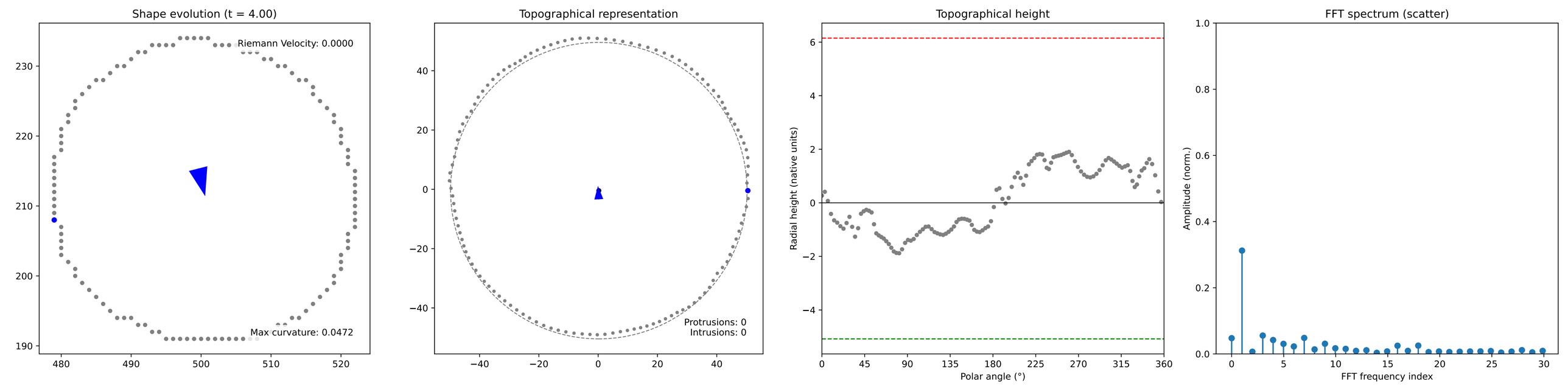
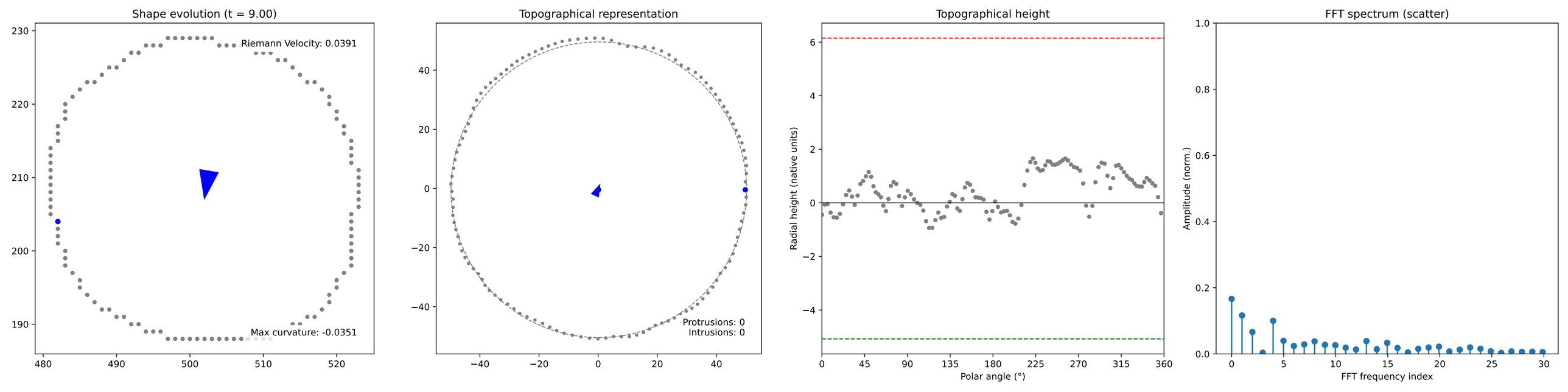
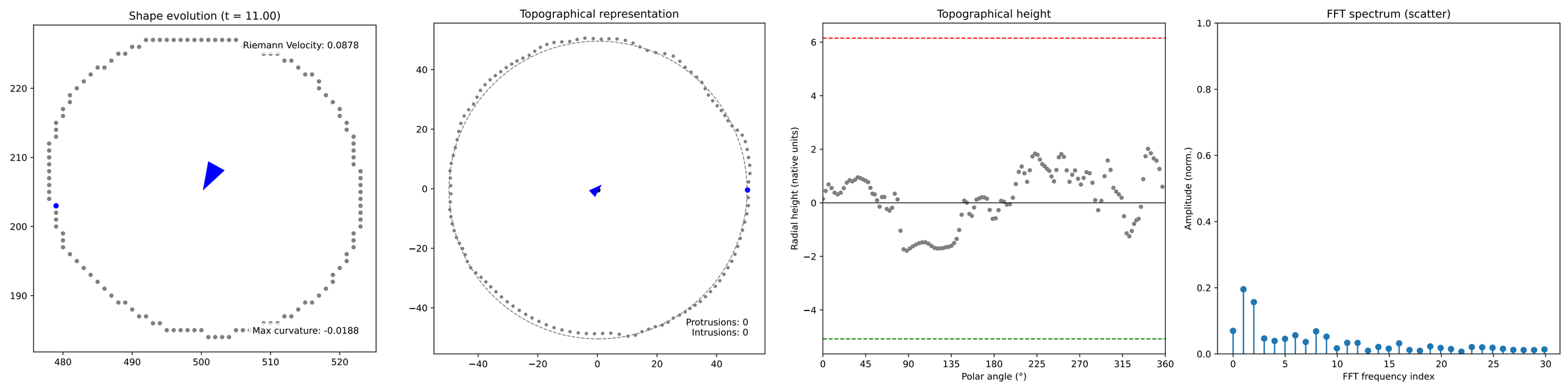
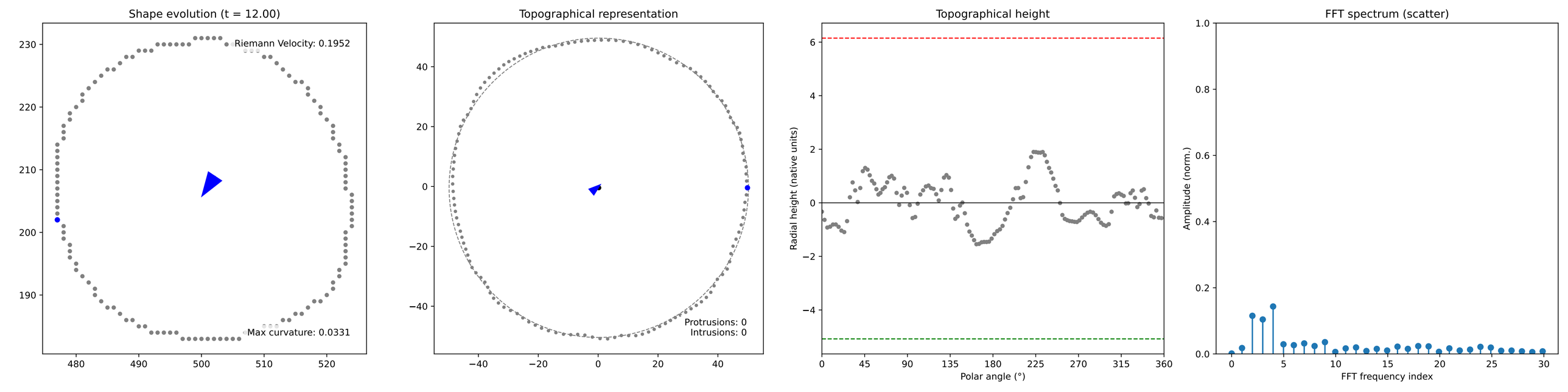
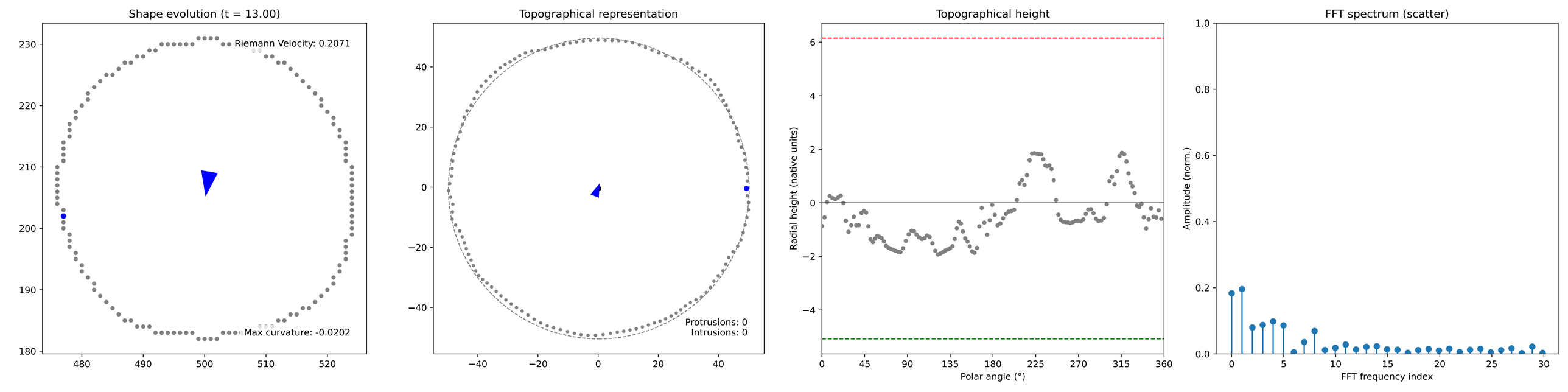
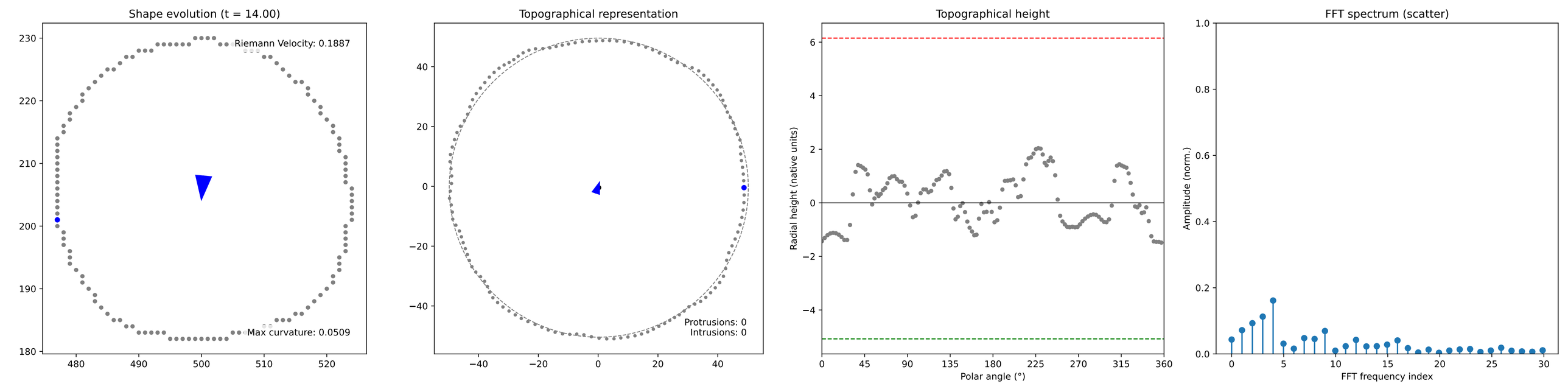

Shape evolution (t = 4.00)
Riemann Velocity: 0.0000
Max curvature: 0.0472
Topographical representation
Protrusions: 0
Intrusions: 0
Topographical height
Radial height (native units)
Polar angle (°)
FFT spectrum (scatter)
Amplitude (norm.)
FFT frequency index

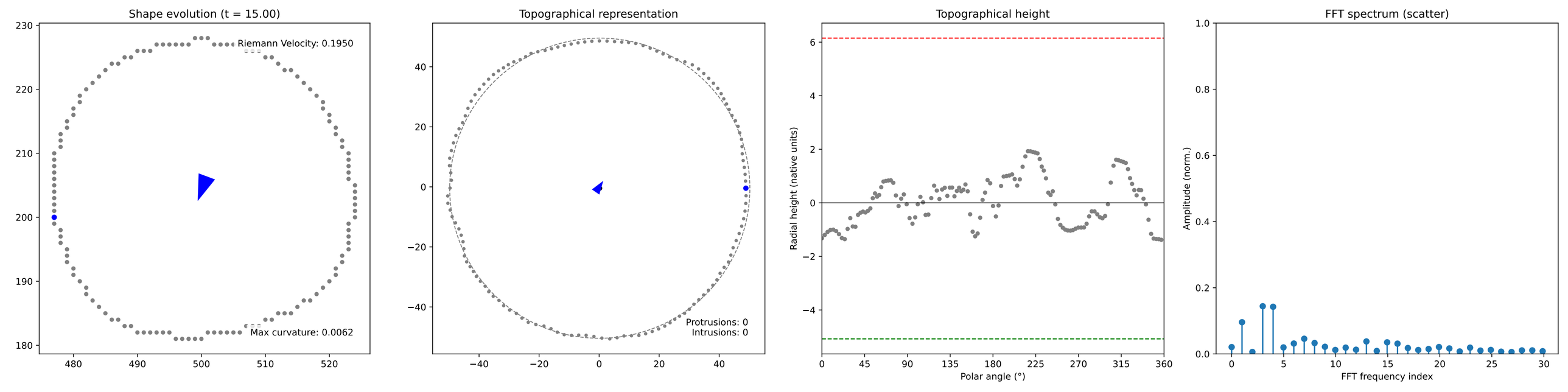

Shape evolution (t = 9.00)
Riemann Velocity: 0.0391
Max curvature: -0.0351
Topographical representation
Protrusions: 0
Intrusions: 0
Topographical height
Radial height (native units)
Polar angle (°)
FFT spectrum (scatter)
Amplitude (norm.)
FFT frequency index

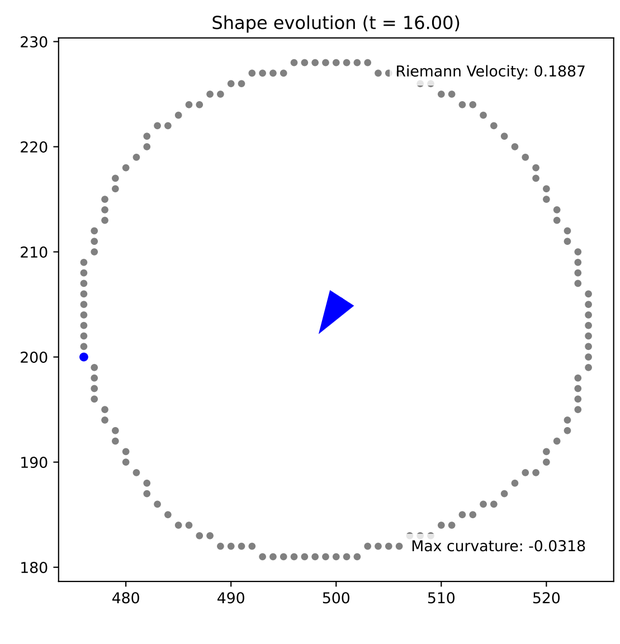

Shape evolution (t = 11.00)
Riemann Velocity: 0.0878
Max curvature: -0.0188
Topographical representation
Protrusions: 0
Intrusions: 0
Topographical height
Radial height (native units)
Polar angle (°)
FFT spectrum (scatter)
Amplitude (norm.)
FFT frequency index

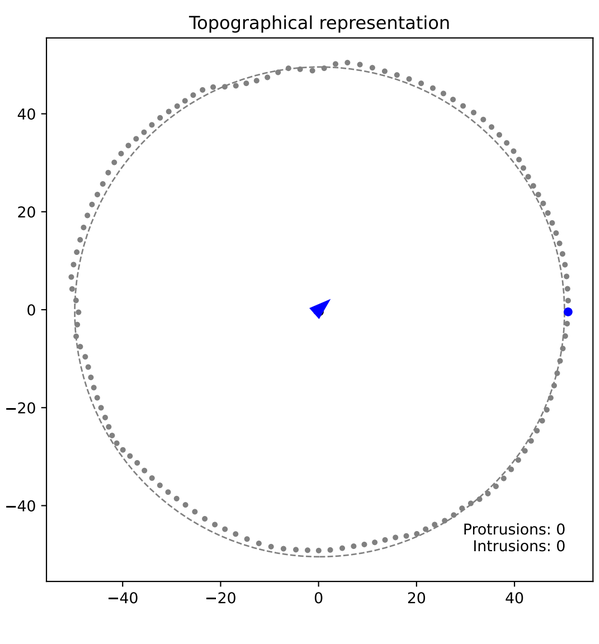

Shape evolution (t = 12.00)
Riemann Velocity: 0.1952
Max curvature: 0.0331
Topographical representation
Protrusions: 0
Intrusions: 0
Topographical height
Radial height (native units)
Polar angle (°)
FFT spectrum (scatter)
Amplitude (norm.)
FFT frequency index

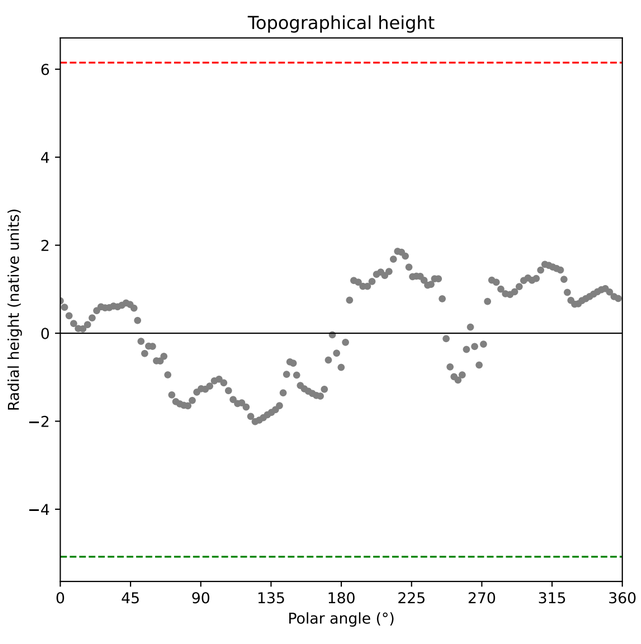

Shape evolution (t = 13.00)
Riemann Velocity: 0.2071
Max curvature: -0.0202
Topographical representation
Protrusions: 0
Intrusions: 0
Topographical height
Radial height (native units)
Polar angle (°)
FFT spectrum (scatter)
Amplitude (norm.)
FFT frequency index

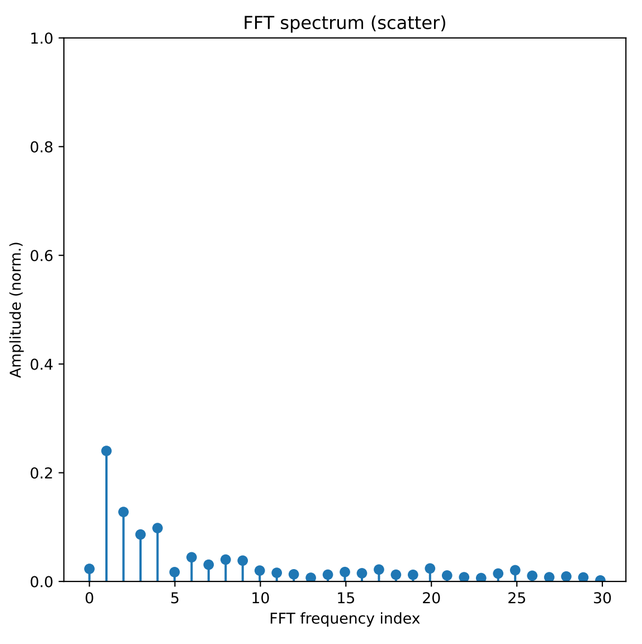

Shape evolution (t = 14.00)
Riemann Velocity: 0.1887
Max curvature: 0.0509
Topographical representation
Protrusions: 0
Intrusions: 0
Topographical height
Radial height (native units)
Polar angle (°)
FFT spectrum (scatter)
Amplitude (norm.)
FFT frequency index

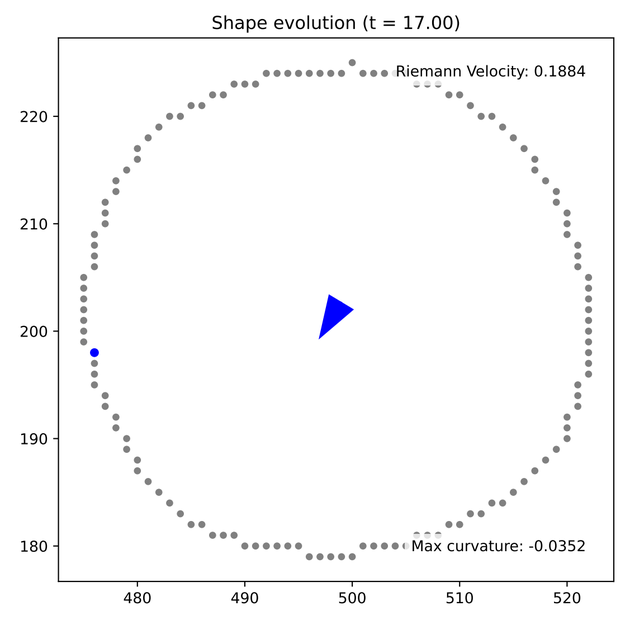

Shape evolution (t = 15.00)
Riemann Velocity: 0.1950
Max curvature: 0.0062
Topographical representation
Protrusions: 0
Intrusions: 0
Topographical height
Radial height (native units)
Polar angle (°)
FFT spectrum (scatter)
Amplitude (norm.)
FFT frequency index

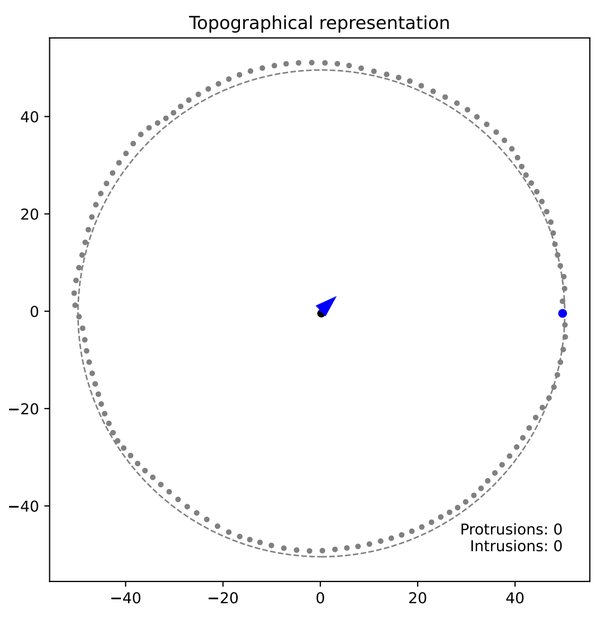

Shape evolution (t = 16.00)
Riemann Velocity: 0.1887
Max curvature: -0.0318
230
220
210
200
190
180
480
490
500
510
520

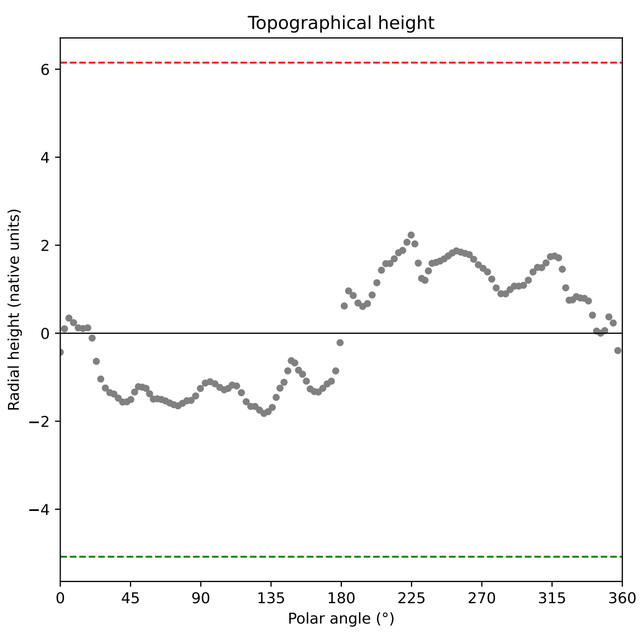

Topographical representation
Protrusions: 0
Intrusions: 0
40
20
0
−20
−40
−40
−20
0
20
40

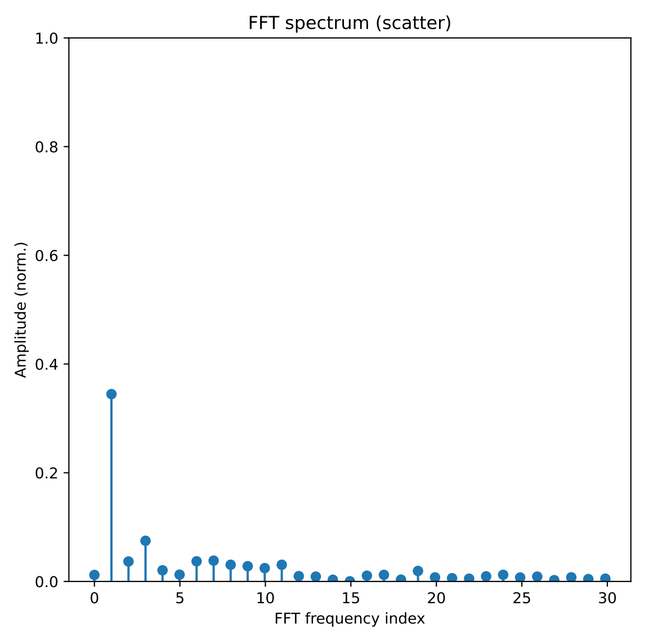

Topographical height
Radial height (native units)
Polar angle (°)
6
4
2
0
−2
−4
0
45
90
135
180
225
270
315
360

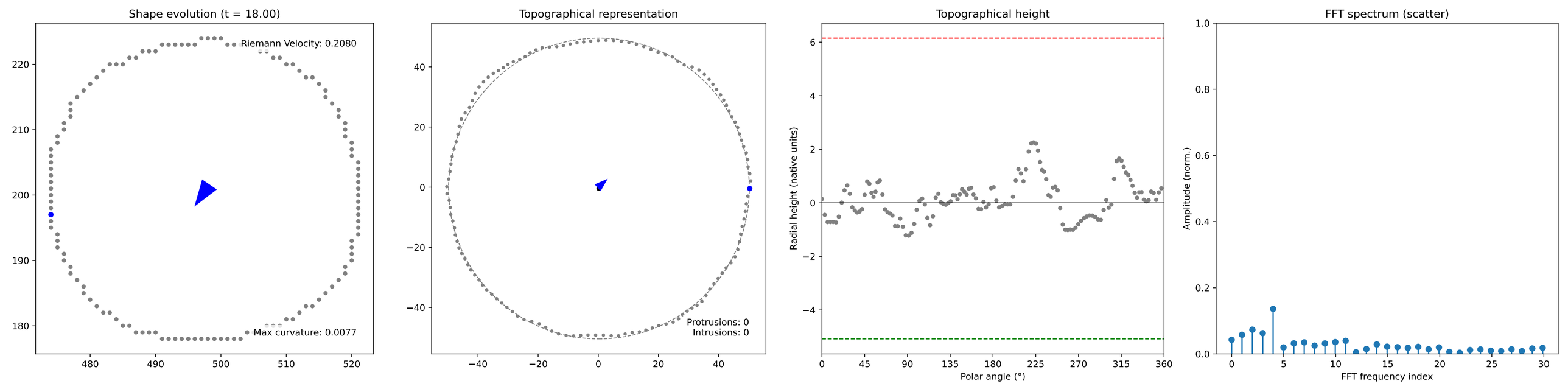

FFT spectrum (scatter)
Amplitude (norm.)
FFT frequency index
1.0
0.8
0.6
0.4
0.2
0.0
0
5
10
15
20
25
30

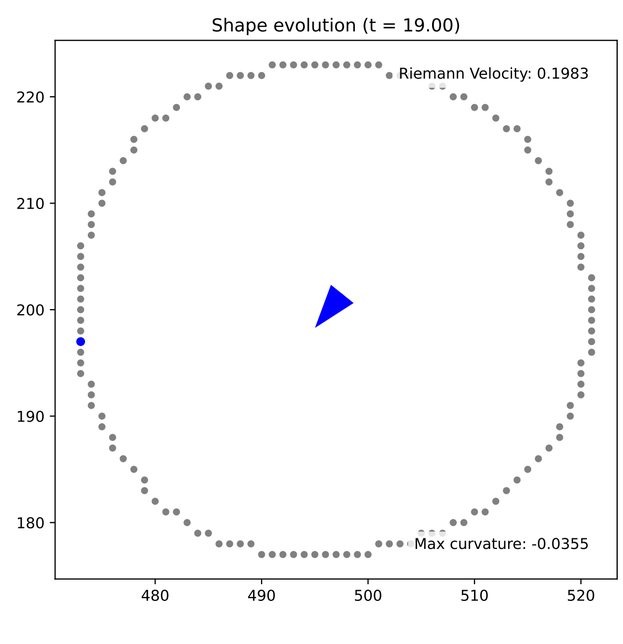

Shape evolution (t = 17.00)
Riemann Velocity: 0.1884
Max curvature: -0.0352
220
210
200
190
180
480
490
500
510
520

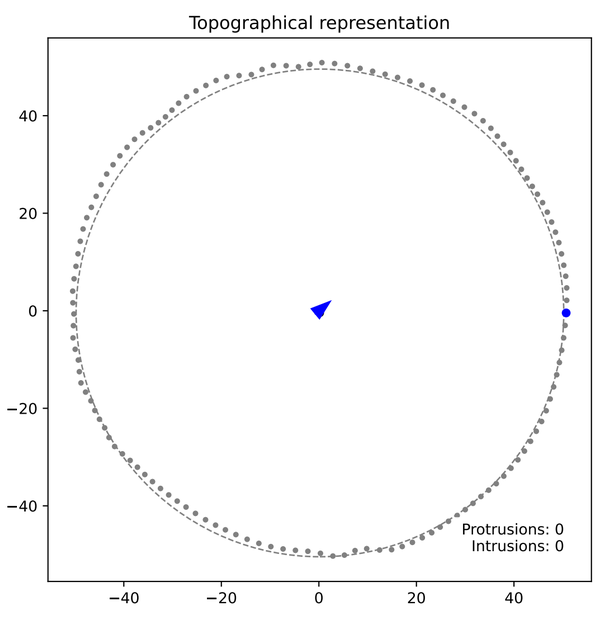

Topographical representation
Protrusions: 0
Intrusions: 0
40
20
0
−20
−40
−40
−20
0
20
40

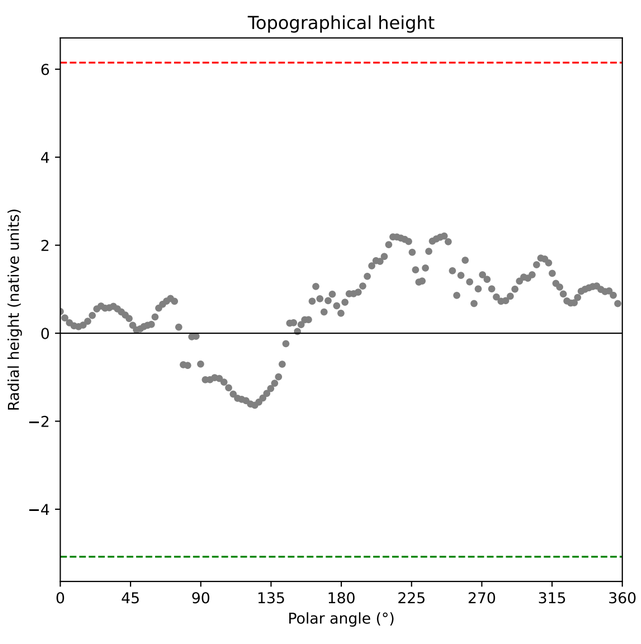

Topographical height
Radial height (native units)
Polar angle (°)
6
4
2
0
−2
−4
0
45
90
135
180
225
270
315
360

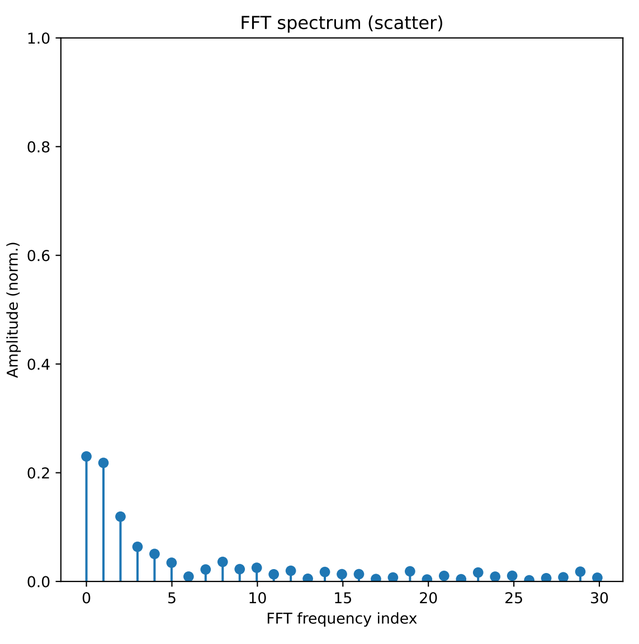

FFT spectrum (scatter)
Amplitude (norm.)
FFT frequency index
1.0
0.8
0.6
0.4
0.2
0.0
0
5
10
15
20
25
30

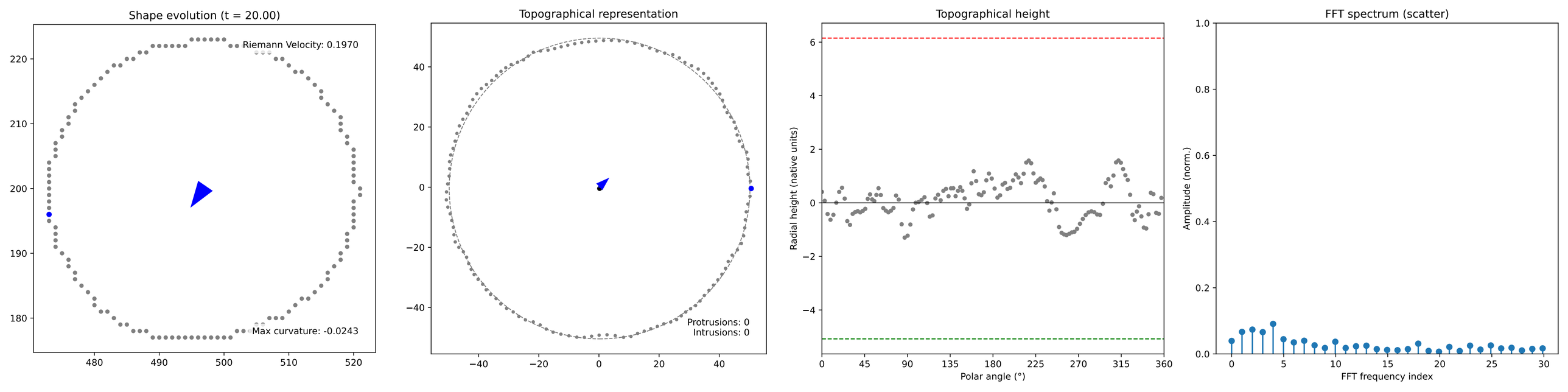

Shape evolution (t = 18.00)
Riemann Velocity: 0.2080
Max curvature: 0.0077
Topographical representation
Protrusions: 0
Intrusions: 0
Topographical height
Radial height (native units)
Polar angle (°)
FFT spectrum (scatter)
Amplitude (norm.)
FFT frequency index

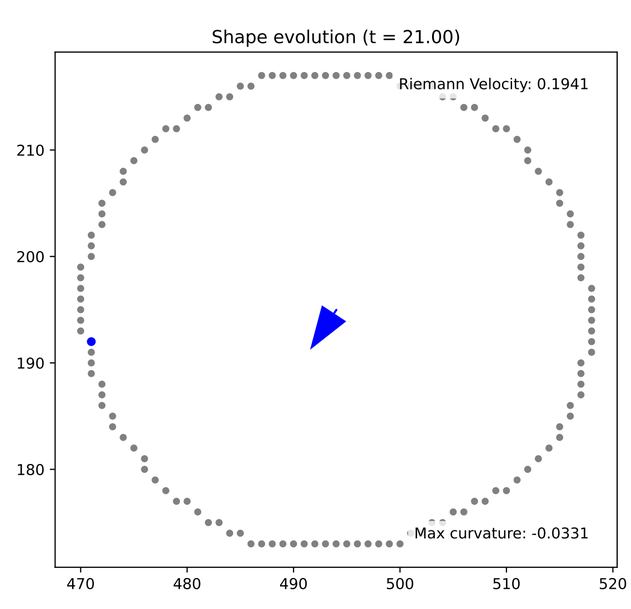

Shape evolution (t = 19.00)
Riemann Velocity: 0.1983
Max curvature: -0.0355

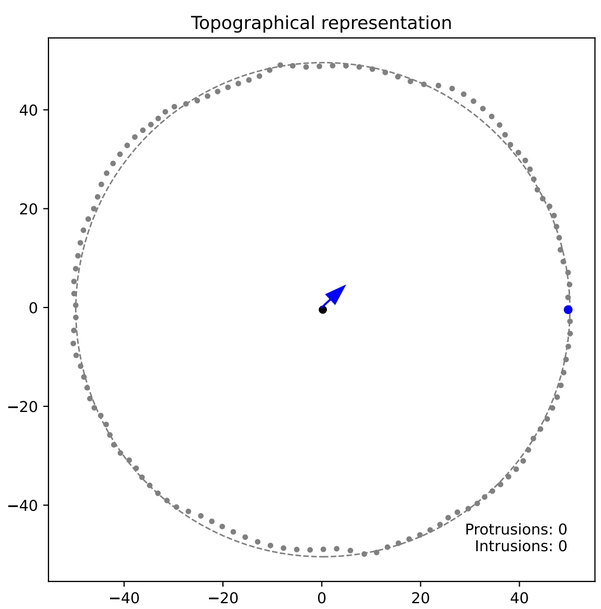

Topographical representation
Protrusions: 0
Intrusions: 0

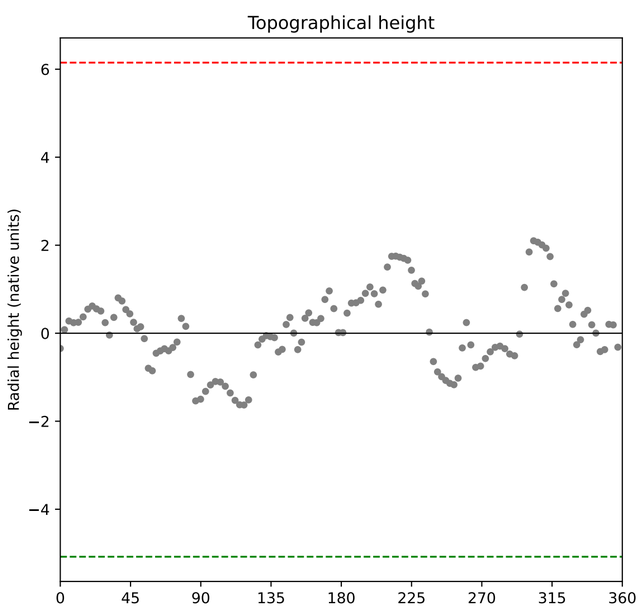

Topographical height
Radial height (native units)
Polar angle (°)

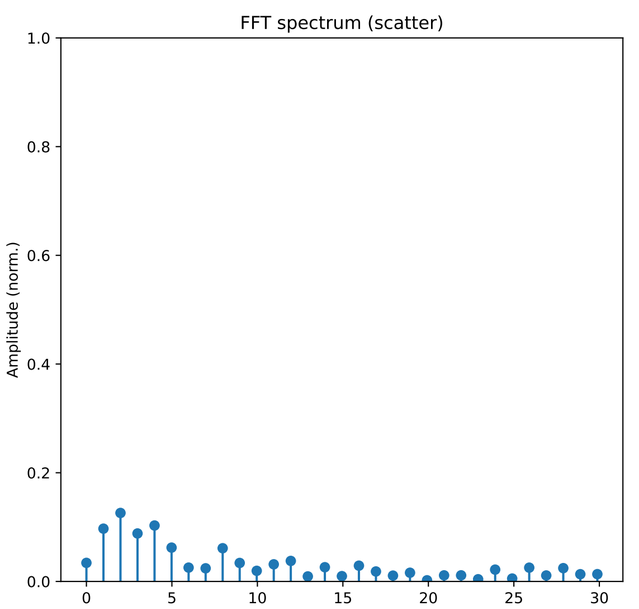

FFT spectrum (scatter)
Amplitude (norm.)
FFT frequency index

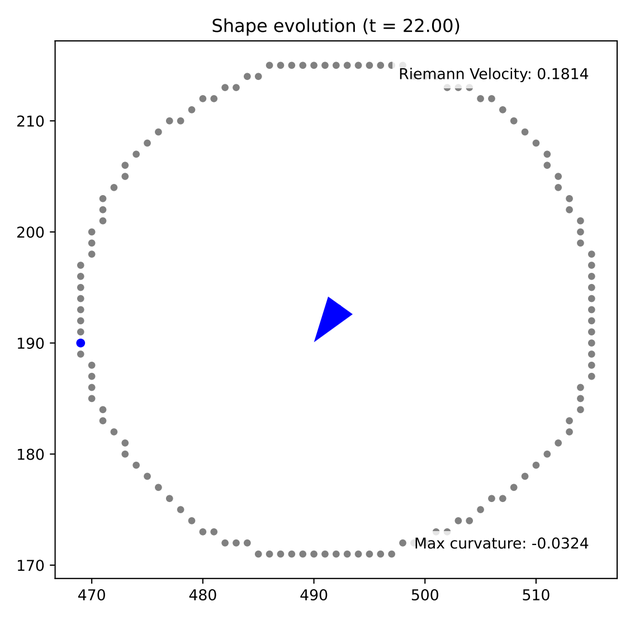

Shape evolution (t = 20.00)
Riemann Velocity: 0.1970
Max curvature: -0.0243
Topographical representation
Protrusions: 0
Intrusions: 0
Topographical height
Radial height (native units)
Polar angle (°)
FFT spectrum (scatter)
Amplitude (norm.)
FFT frequency index

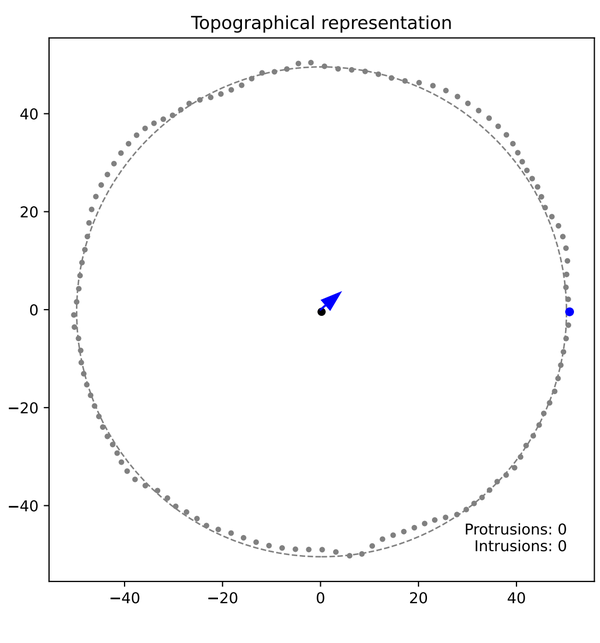

Shape evolution (t = 21.00)
Riemann Velocity: 0.1941
Max curvature: -0.0331
210
200
190
180
470
480
490
500
510
520

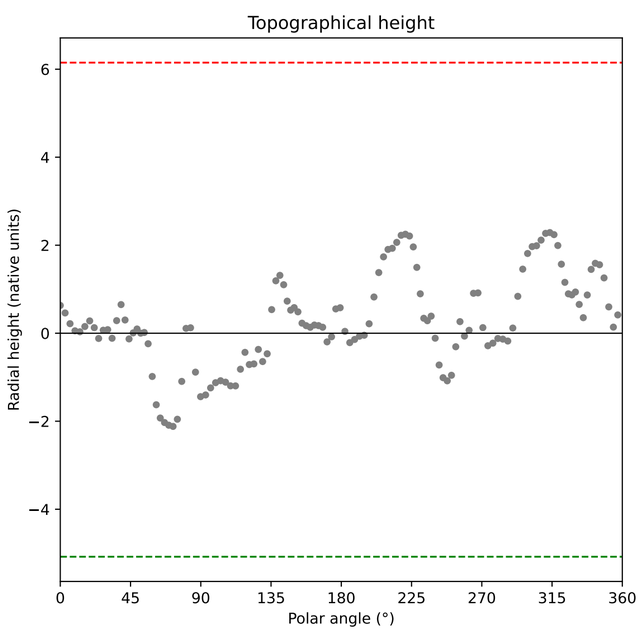

Topographical representation
Protrusions: 0
Intrusions: 0
40
20
0
−20
−40
−40
−20
0
20
40

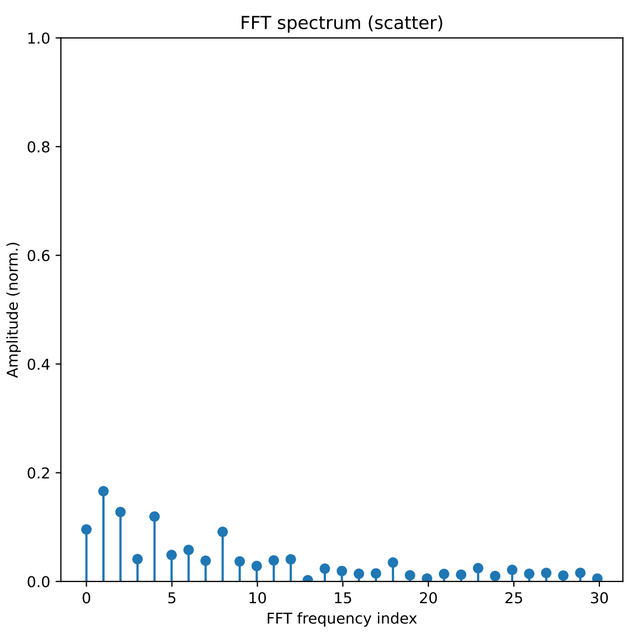

Topographical height
Radial height (native units)
Polar angle (°)
6
4
2
0
−2
−4
0
45
90
135
180
225
270
315
360

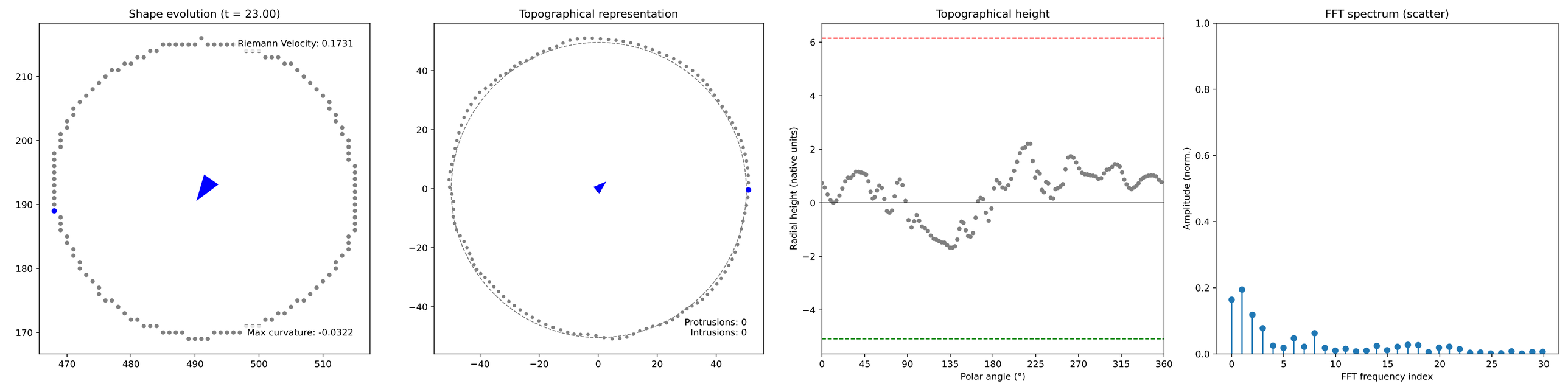

FFT spectrum (scatter)
Amplitude (norm.)
FFT frequency index
1.0
0.8
0.6
0.4
0.2
0.0
0
5
10
15
20
25
30

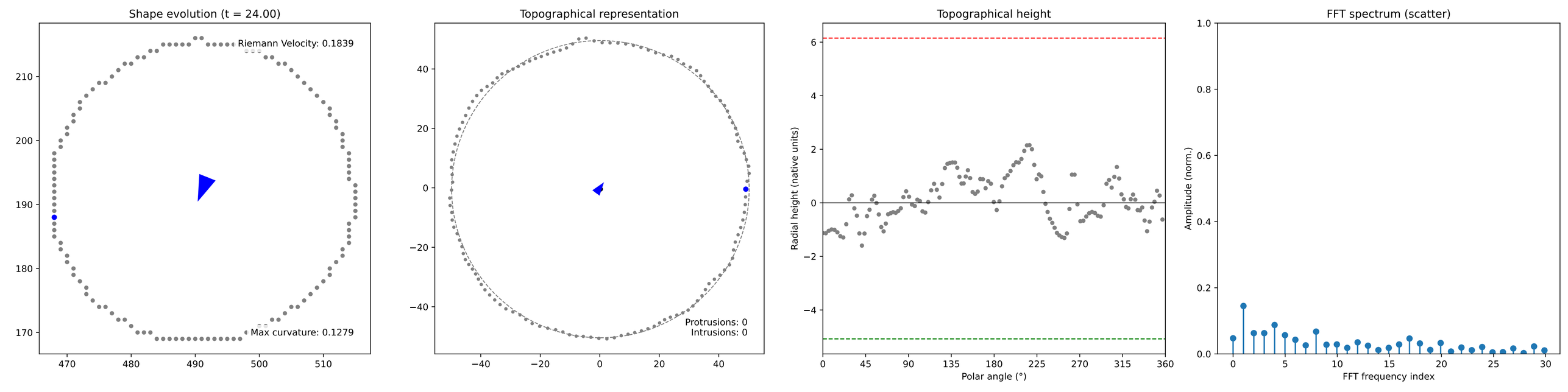

Shape evolution (t = 22.00)
Riemann Velocity: 0.1814
Max curvature: -0.0324
210
200
190
180
170
470
480
490
500
510

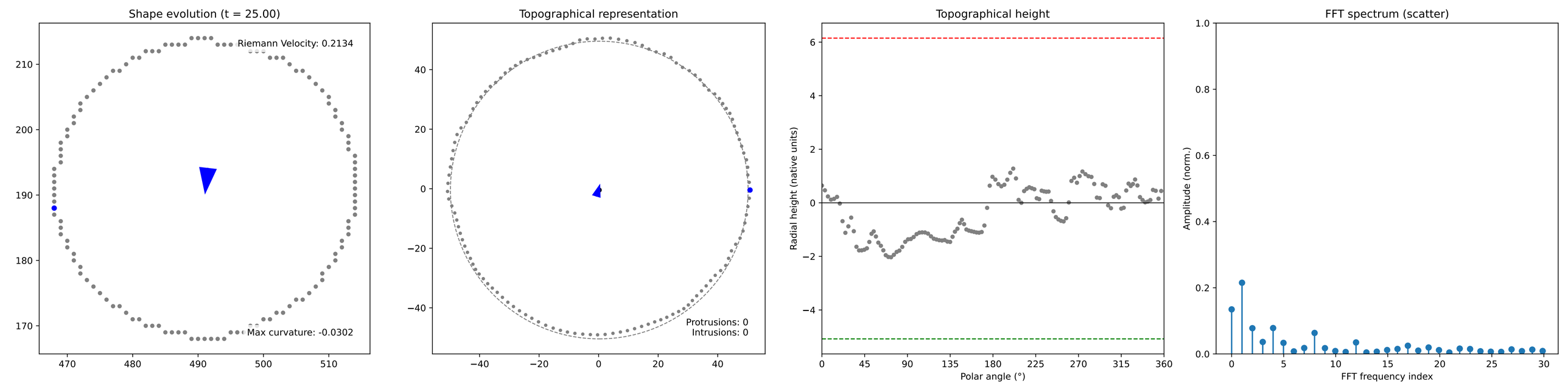

Topographical representation
Protrusions: 0
Intrusions: 0
40
20
0
−20
−40
−40
−20
0
20
40

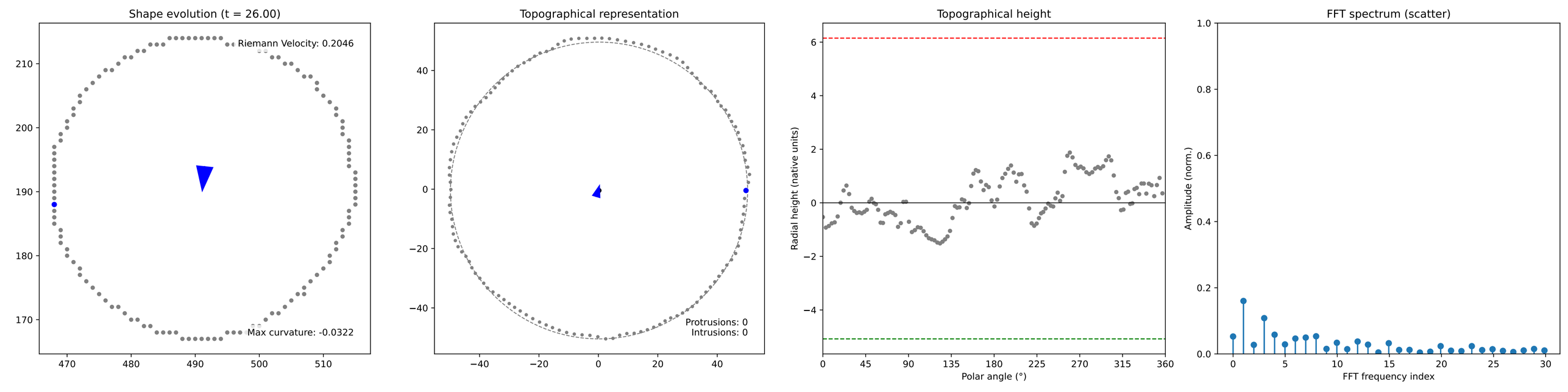

Topographical height
Radial height (native units)
Polar angle (°)
6
4
2
0
−2
−4
0
45
90
135
180
225
270
315
360

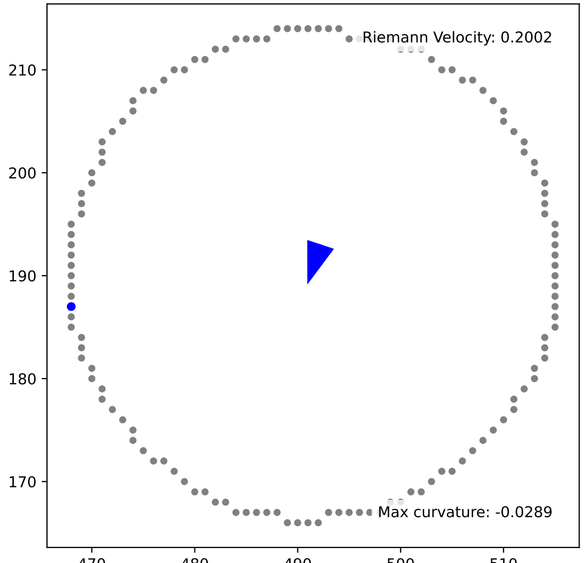

FFT spectrum (scatter)
Amplitude (norm.)
FFT frequency index
1.0
0.8
0.6
0.4
0.2
0.0
0
5
10
15
20
25
30

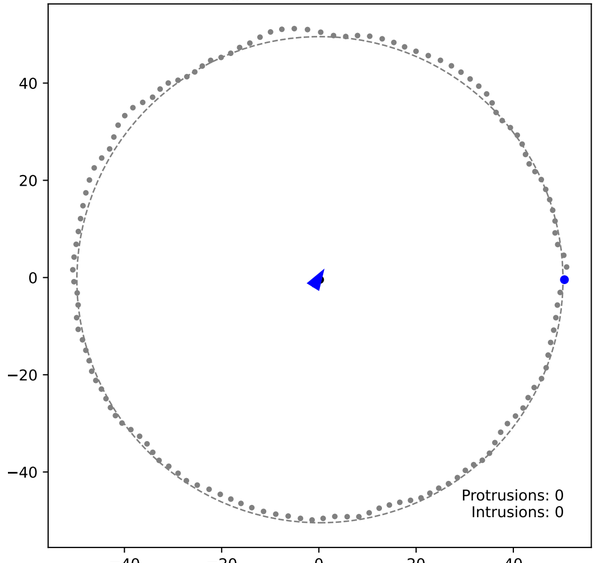

Shape evolution (t = 23.00)
Riemann Velocity: 0.1731
Max curvature: -0.0322
Topographical representation
Protrusions: 0
Intrusions: 0
Topographical height
Radial height (native units)
Polar angle (°)
FFT spectrum (scatter)
Amplitude (norm.)
FFT frequency index

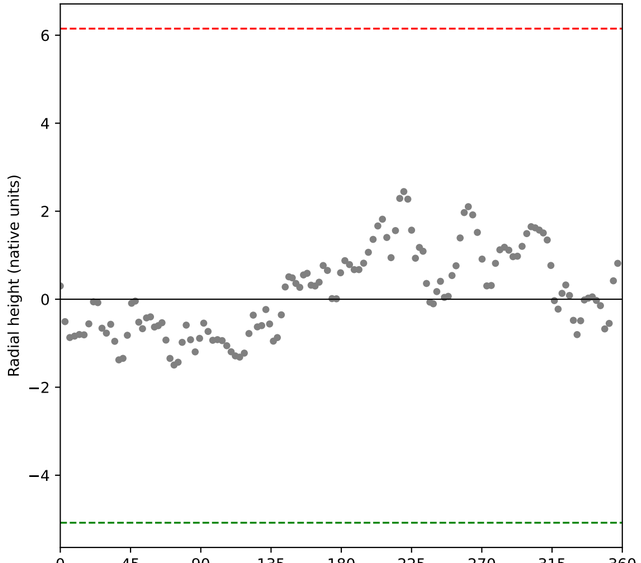

Shape evolution (t = 24.00)
Riemann Velocity: 0.1839
Max curvature: 0.1279
Topographical representation
Protrusions: 0
Intrusions: 0
Topographical height
Radial height (native units)
Polar angle (°)
FFT spectrum (scatter)
Amplitude (norm.)
FFT frequency index

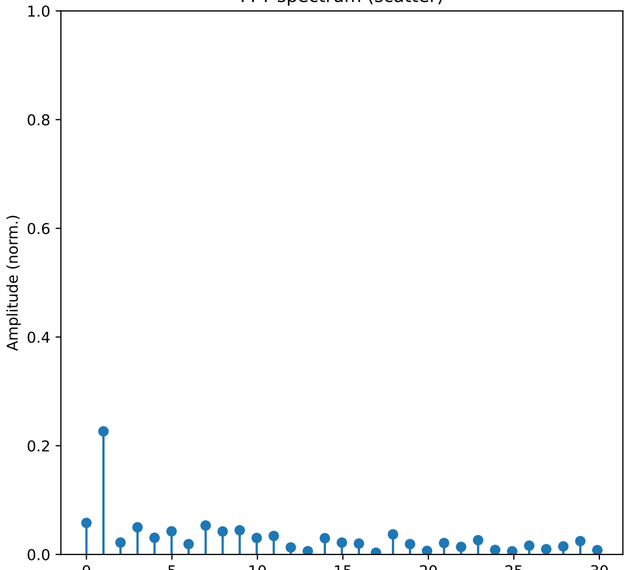

Shape evolution (t = 25.00)
Riemann Velocity: 0.2134
Max curvature: -0.0302
Topographical representation
Protrusions: 0
Intrusions: 0
Topographical height
Radial height (native units)
Polar angle (°)
FFT spectrum (scatter)
Amplitude (norm.)
FFT frequency index

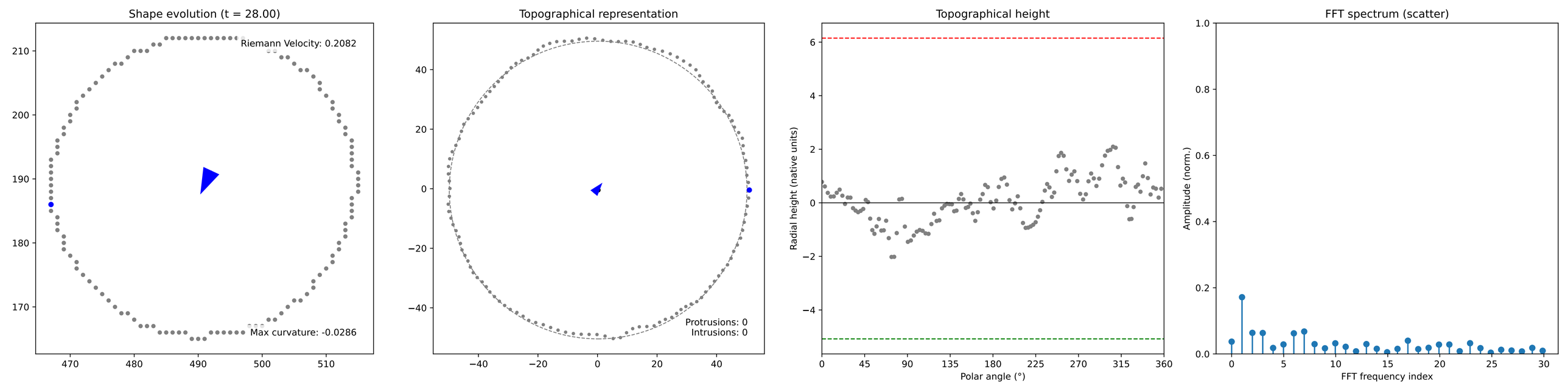

Shape evolution (t = 26.00)
Riemann Velocity: 0.2046
Max curvature: -0.0322
Topographical representation
Protrusions: 0
Intrusions: 0
Topographical height
Radial height (native units)
Polar angle (°)
FFT spectrum (scatter)
Amplitude (norm.)
FFT frequency index

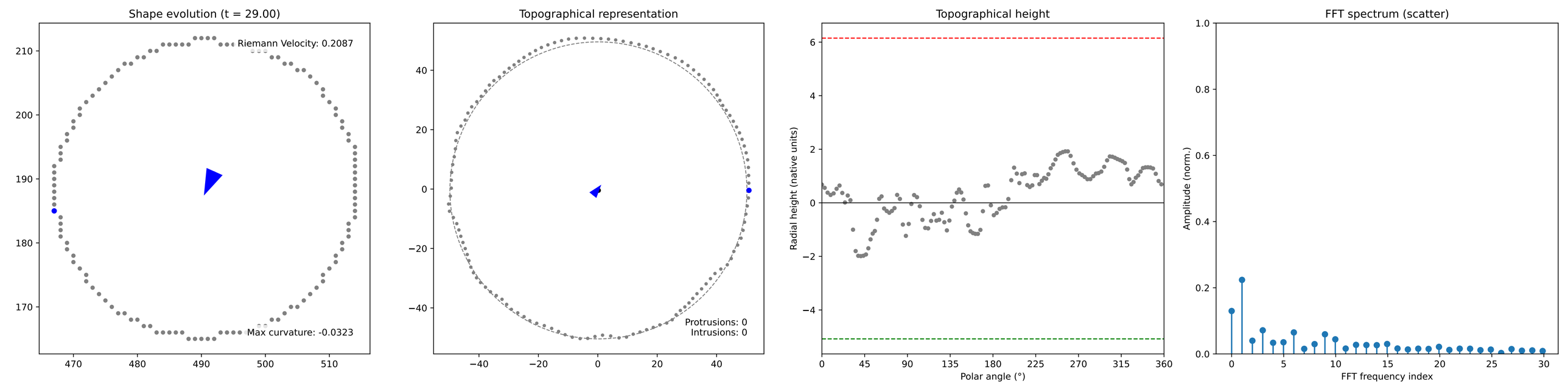

Shape evolution (t = 27.00)
Riemann Velocity: 0.2002
Max curvature: -0.0289
210
200
190
180
170
470
480
490
500
510

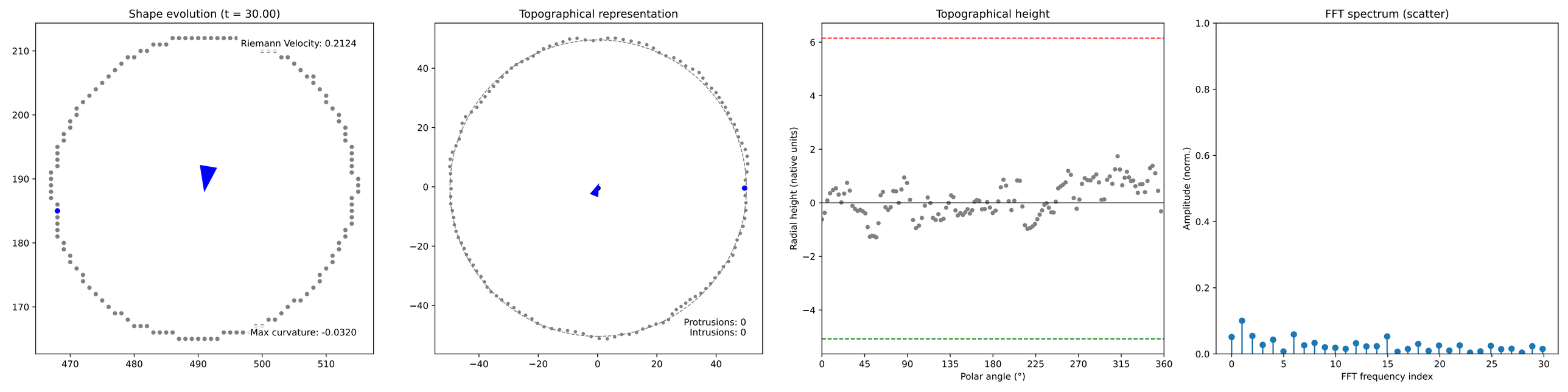

Topographical representation
Protrusions: 0
Intrusions: 0
40
20
0
−20
−40
−40
−20
0
20
40

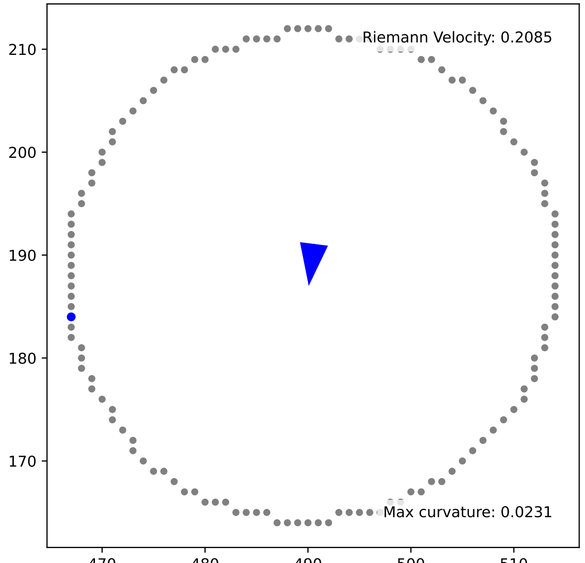

Topographical height
Radial height (native units)
Polar angle (°)
6
4
2
0
−2
−4
0
45
90
135
180
225
270
315
360

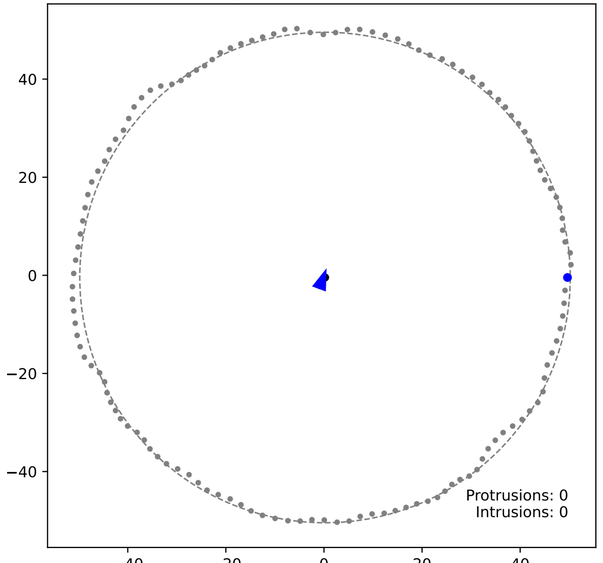

FFT spectrum (scatter)
Amplitude (norm.)
FFT frequency index
1.0
0.8
0.6
0.4
0.2
0.0
0
5
10
15
20
25
30

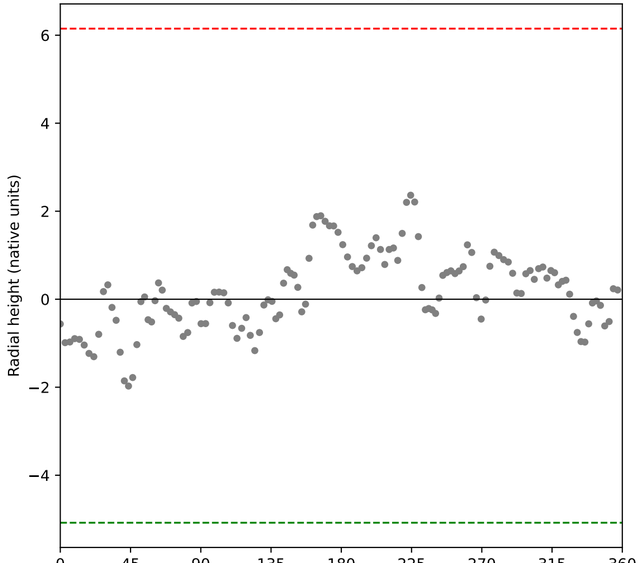

Shape evolution (t = 28.00)
Riemann Velocity: 0.2082
Max curvature: -0.0286
Topographical representation
Protrusions: 0
Intrusions: 0
Topographical height
Radial height (native units)
Polar angle (°)
FFT spectrum (scatter)
Amplitude (norm.)
FFT frequency index

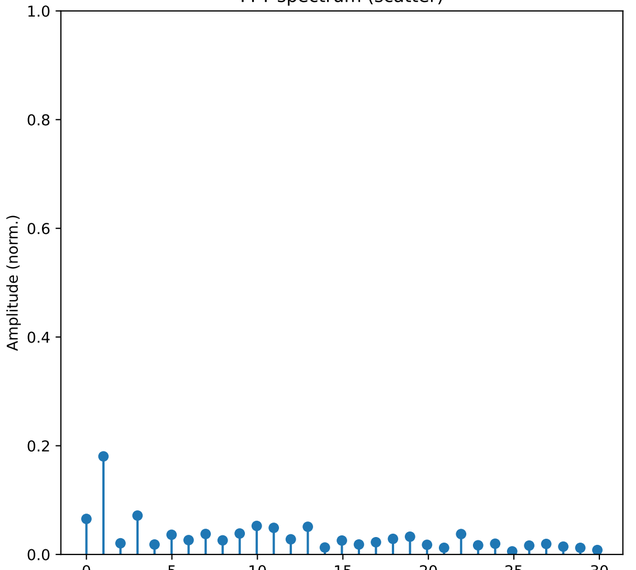

Shape evolution (t = 29.00)
Riemann Velocity: 0.2087
Max curvature: -0.0323
Topographical representation
Protrusions: 0
Intrusions: 0
Topographical height
Radial height (native units)
Polar angle (°)
FFT spectrum (scatter)
Amplitude (norm.)
FFT frequency index

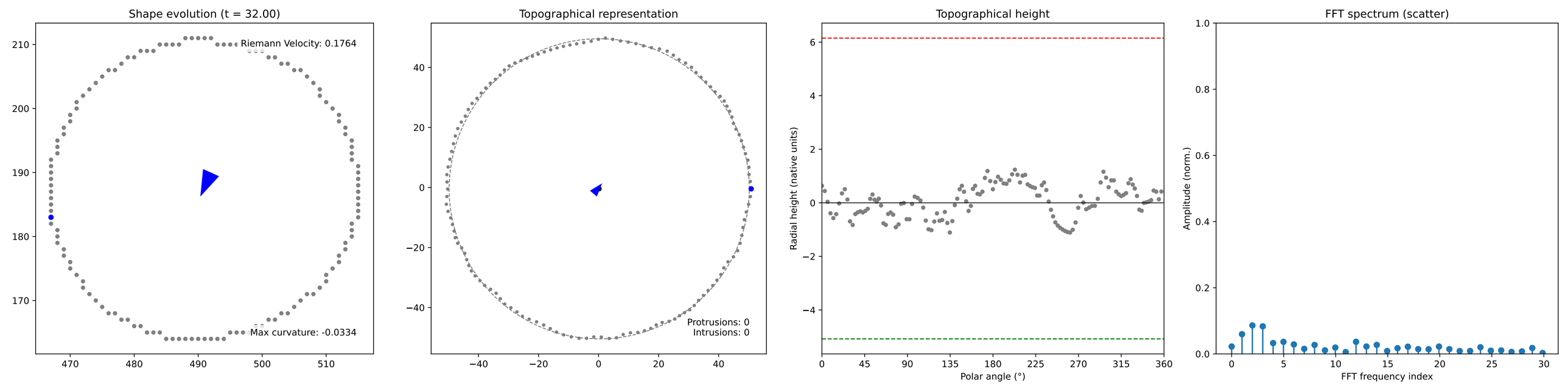

Shape evolution (t = 30.00)
Riemann Velocity: 0.2124
Max curvature: -0.0320
Topographical representation
Protrusions: 0
Intrusions: 0
Topographical height
Radial height (native units)
Polar angle (°)
FFT spectrum (scatter)
Amplitude (norm.)
FFT frequency index

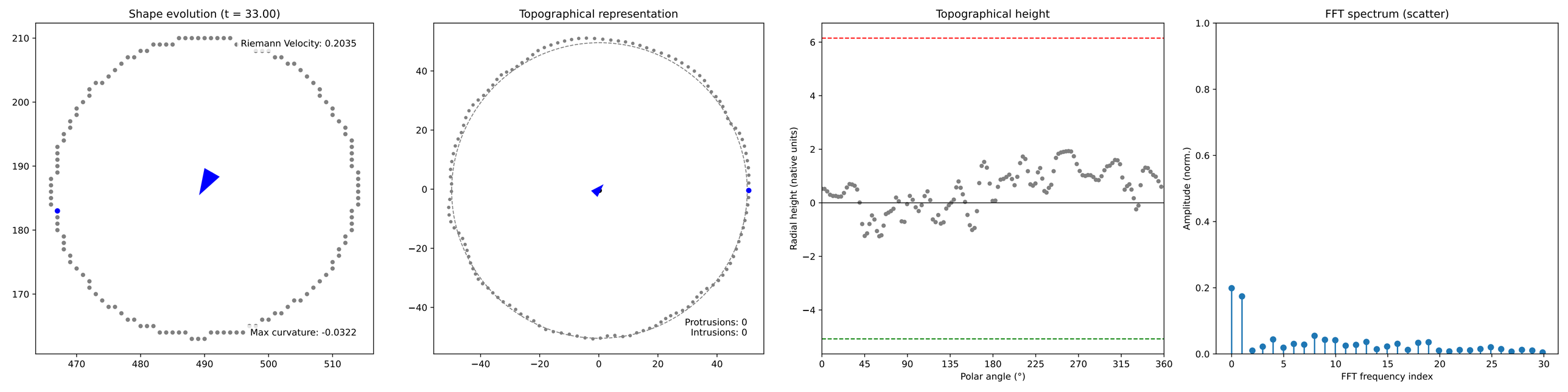

Shape evolution (t = 31.00)
Riemann Velocity: 0.2085
Max curvature: 0.0231
210
200
190
180
170
470
480
490
500
510

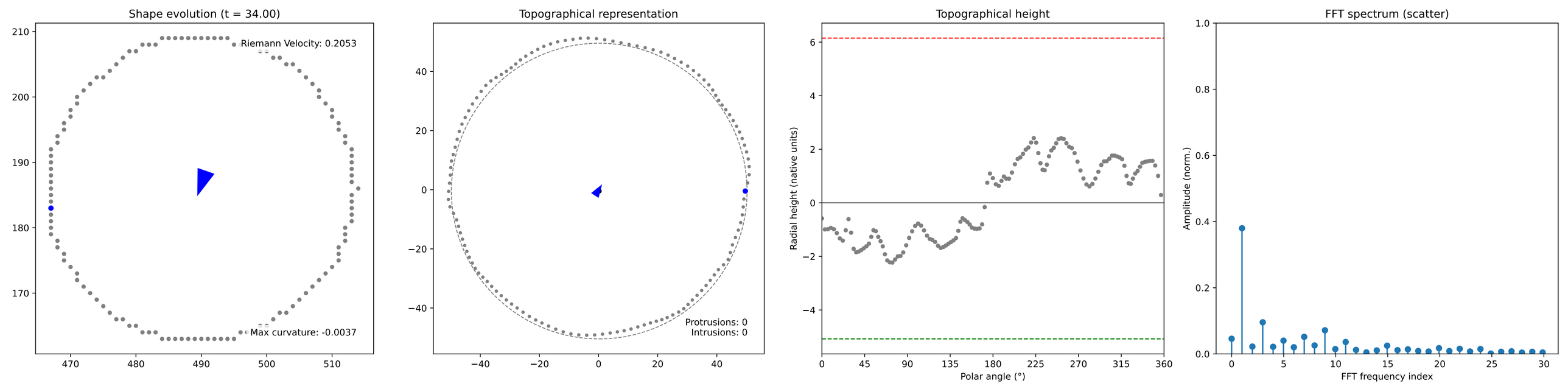

Topographical representation
Protrusions: 0
Intrusions: 0
40
20
0
−20
−40
−40
−20
0
20
40

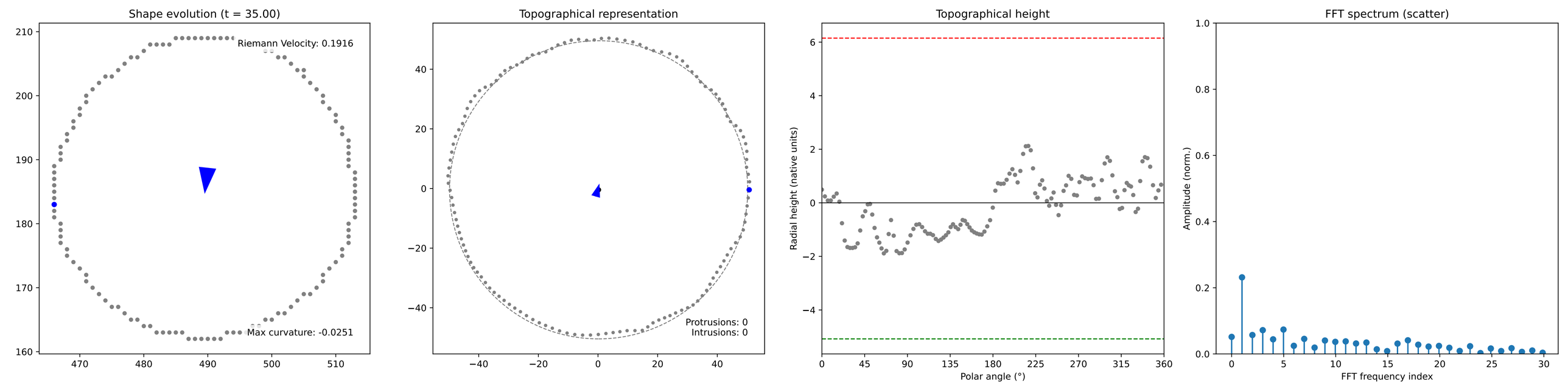

Topographical height
Radial height (native units)
Polar angle (°)
6
4
2
0
−2
−4
0
45
90
135
180
225
270
315
360

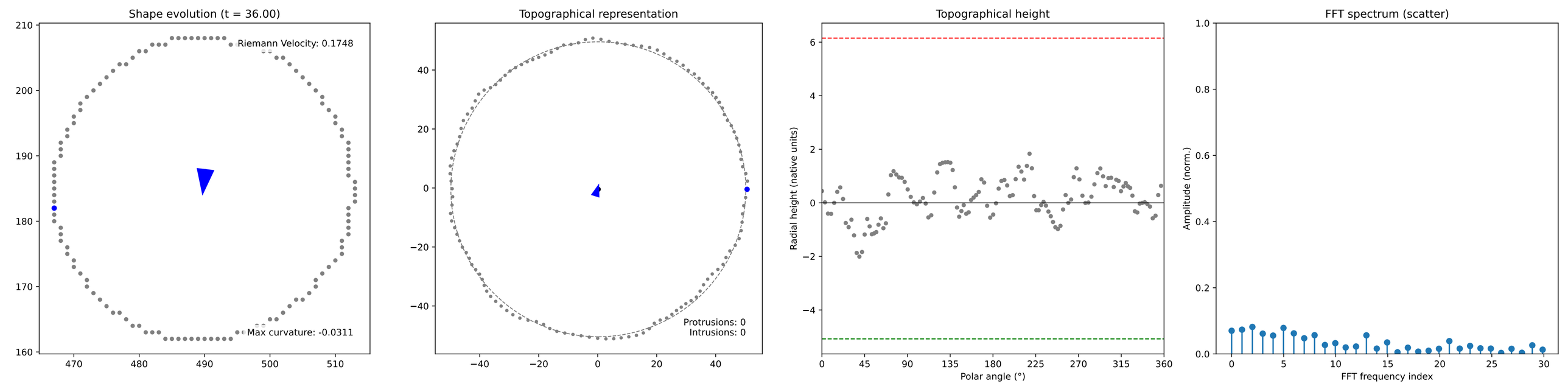

FFT spectrum (scatter)
Amplitude (norm.)
FFT frequency index
1.0
0.8
0.6
0.4
0.2
0.0
0
5
10
15
20
25
30

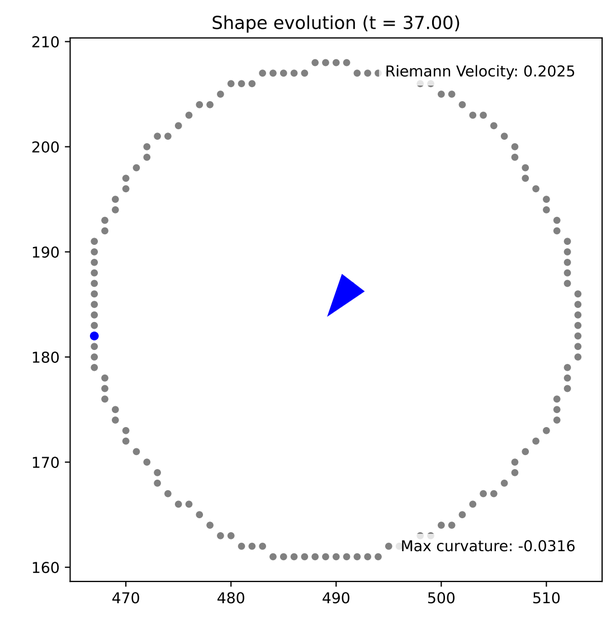

Shape evolution (t = 32.00)
Riemann Velocity: 0.1764
Max curvature: -0.0334
Topographical representation
Protrusions: 0
Intrusions: 0
Topographical height
Radial height (native units)
Polar angle (°)
FFT spectrum (scatter)
Amplitude (norm.)
FFT frequency index

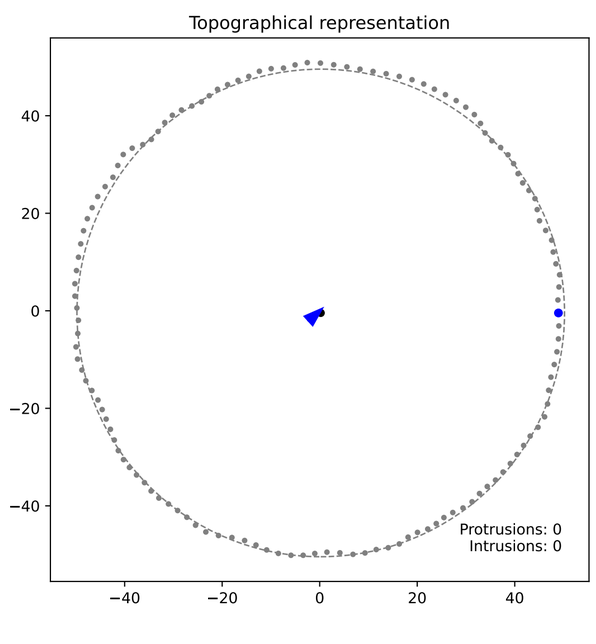

Shape evolution (t = 33.00)
Riemann Velocity: 0.2035
Max curvature: -0.0322
Topographical representation
Protrusions: 0
Intrusions: 0
Topographical height
Radial height (native units)
Polar angle (°)
FFT spectrum (scatter)
Amplitude (norm.)
FFT frequency index

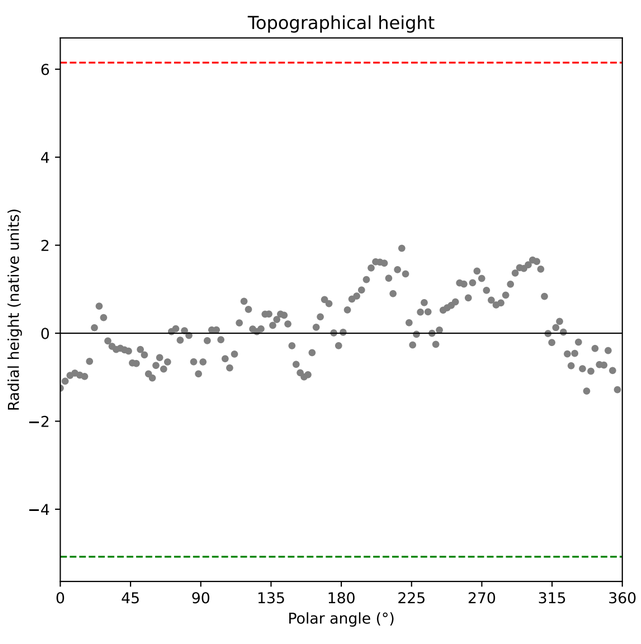

Shape evolution (t = 34.00)
Riemann Velocity: 0.2053
Max curvature: -0.0037
Topographical representation
Protrusions: 0
Intrusions: 0
Topographical height
Radial height (native units)
Polar angle (°)
FFT spectrum (scatter)
Amplitude (norm.)
FFT frequency index

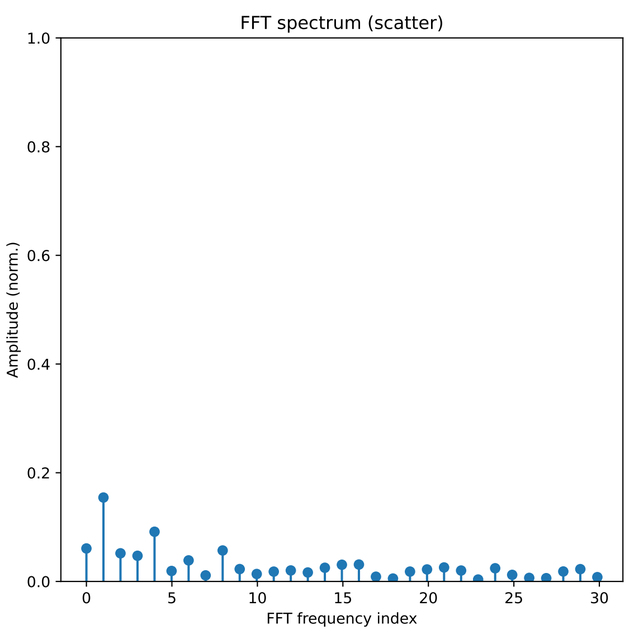

Shape evolution (t = 35.00)
Riemann Velocity: 0.1916
Max curvature: -0.0251
Topographical representation
Protrusions: 0
Intrusions: 0
Topographical height
Radial height (native units)
Polar angle (°)
FFT spectrum (scatter)
Amplitude (norm.)
FFT frequency index

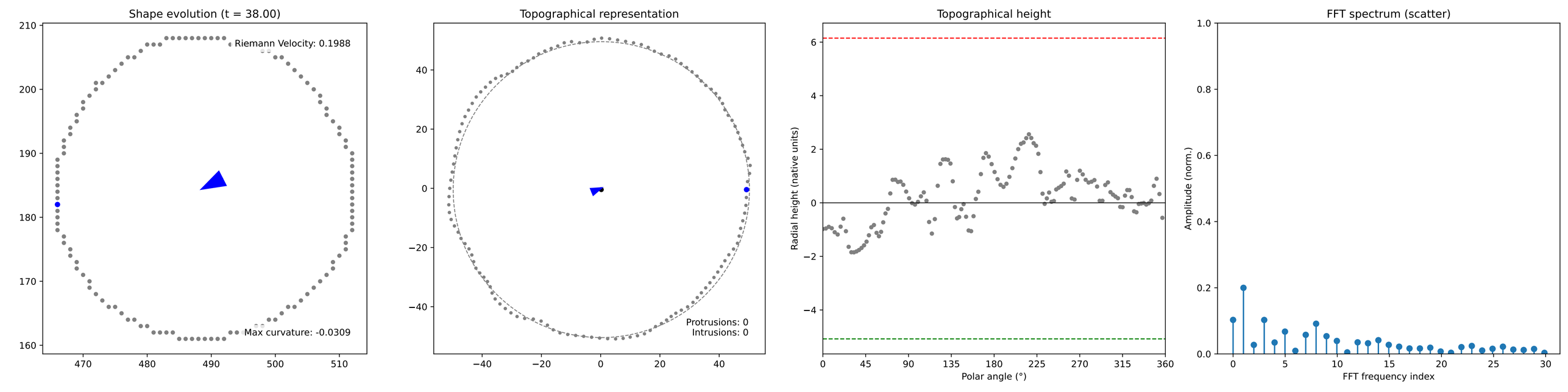

Shape evolution (t = 36.00)
Riemann Velocity: 0.1748
Max curvature: -0.0311
Topographical representation
Protrusions: 0
Intrusions: 0
Topographical height
Radial height (native units)
Polar angle (°)
FFT spectrum (scatter)
Amplitude (norm.)
FFT frequency index

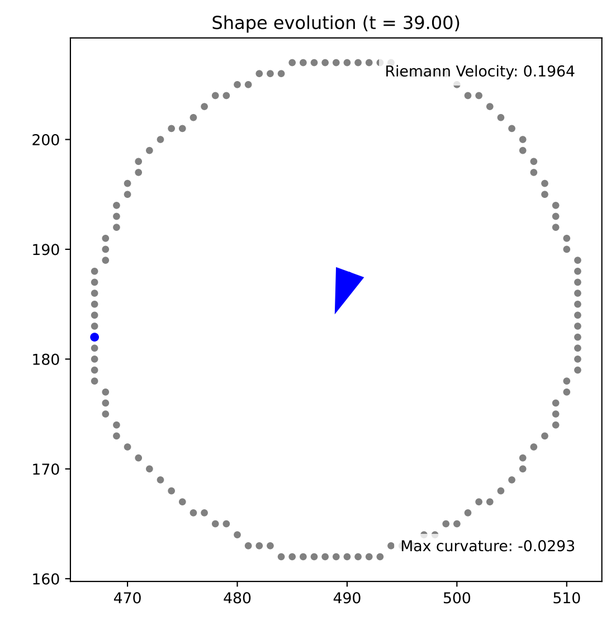

Shape evolution (t = 37.00)
Riemann Velocity: 0.2025
Max curvature: -0.0316
210
200
190
180
170
160
470
480
490
500
510

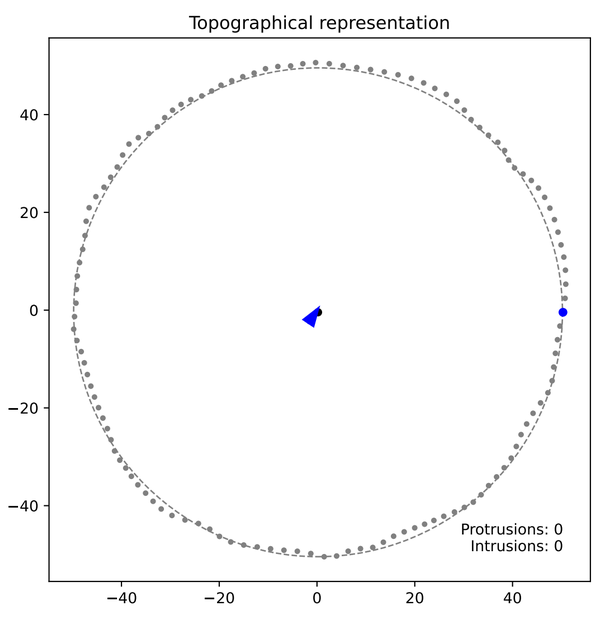

Topographical representation
Protrusions: 0
Intrusions: 0
40
20
0
−20
−40
−40
−20
0
20
40

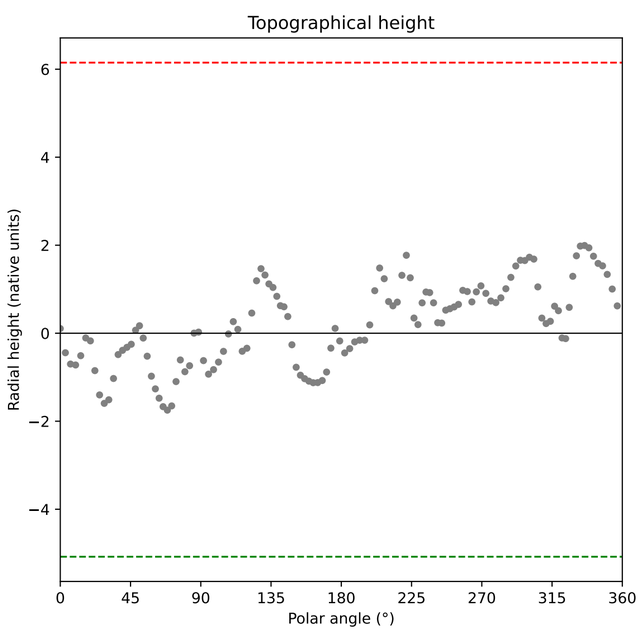

Topographical height
Radial height (native units)
Polar angle (°)
6
4
2
0
−2
−4
0
45
90
135
180
225
270
315
360

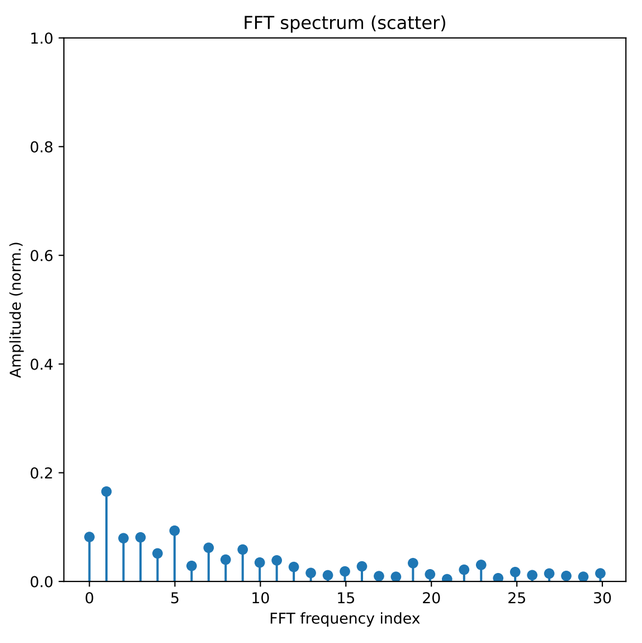

FFT spectrum (scatter)
Amplitude (norm.)
FFT frequency index
1.0
0.8
0.6
0.4
0.2
0.0
0
5
10
15
20
25
30

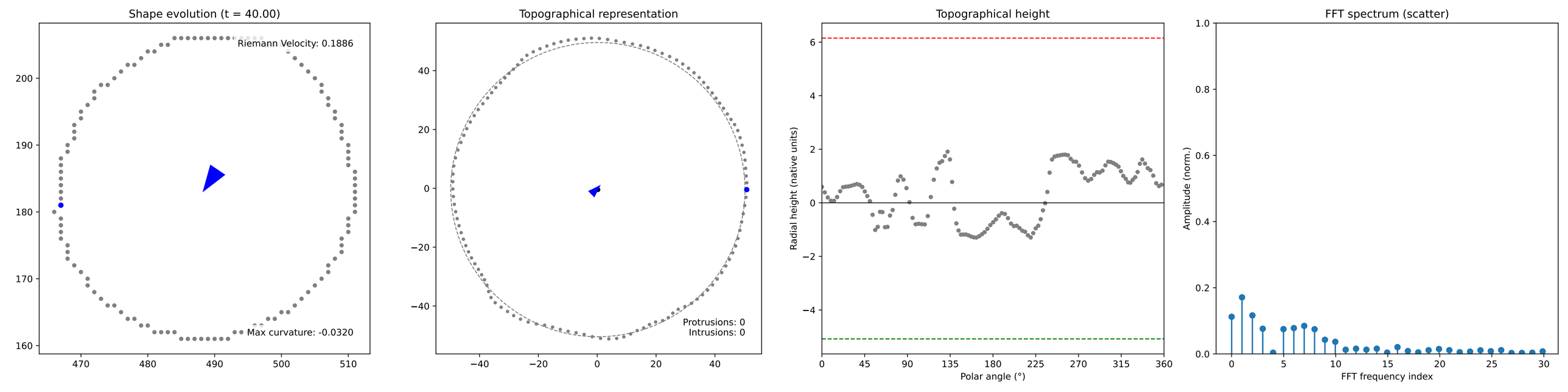

Shape evolution (t = 38.00)
Riemann Velocity: 0.1988
Max curvature: -0.0309
Topographical representation
Protrusions: 0
Intrusions: 0
Topographical height
Radial height (native units)
Polar angle (°)
FFT spectrum (scatter)
Amplitude (norm.)
FFT frequency index

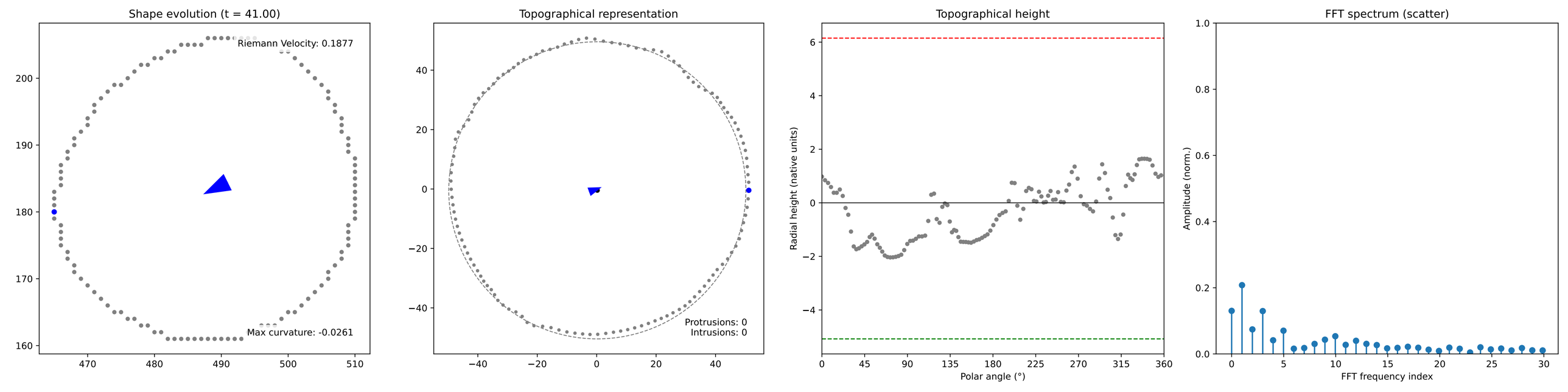

Shape evolution (t = 39.00)
Riemann Velocity: 0.1964
Max curvature: -0.0293
200
190
180
170
160
470
480
490
500
510

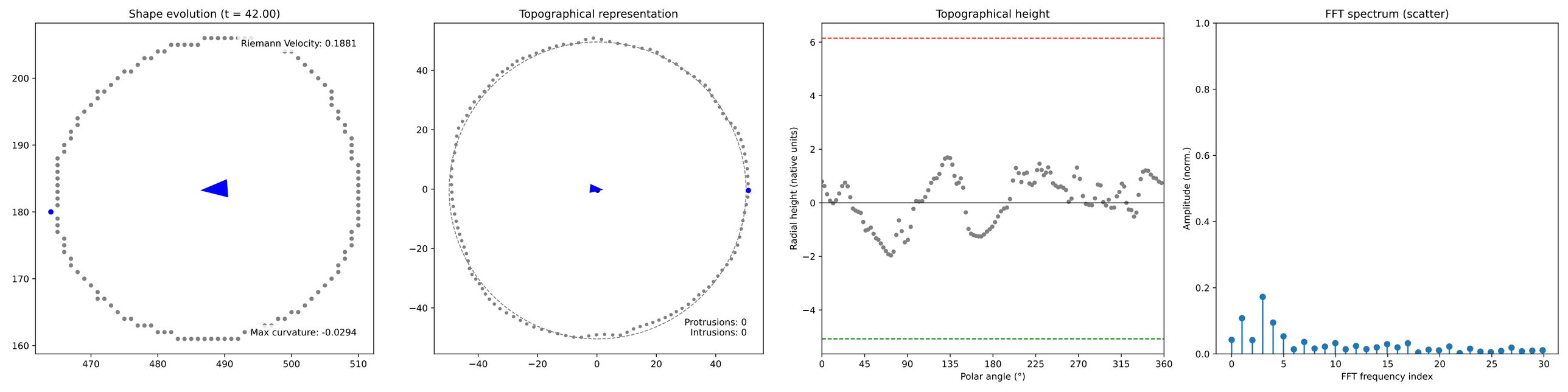

Topographical representation
Protrusions: 0
Intrusions: 0
40
20
0
−20
−40
−40
−20
0
20
40

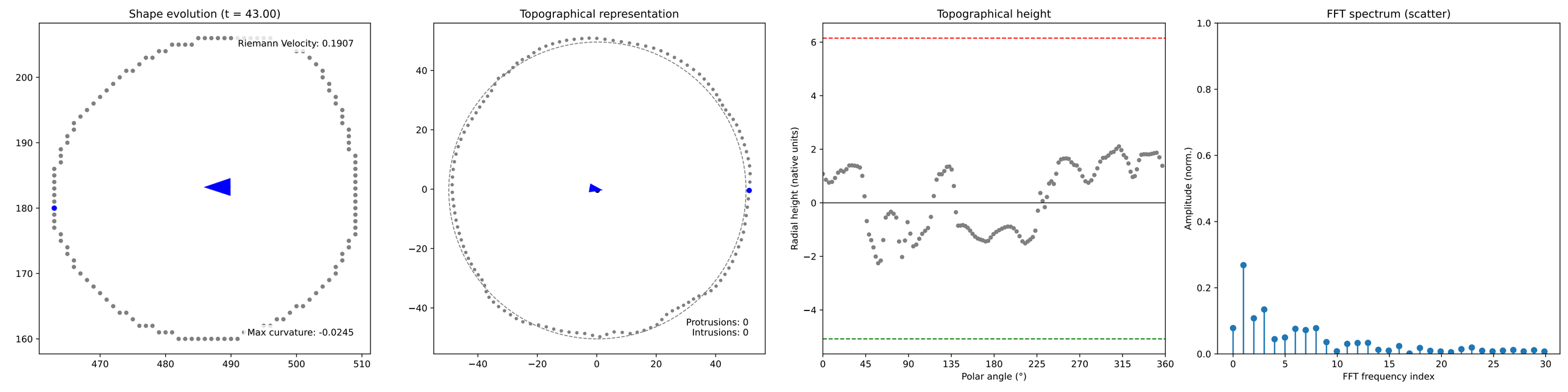

Topographical height
Radial height (native units)
Polar angle (°)
6
4
2
0
−2
−4
0
45
90
135
180
225
270
315
360

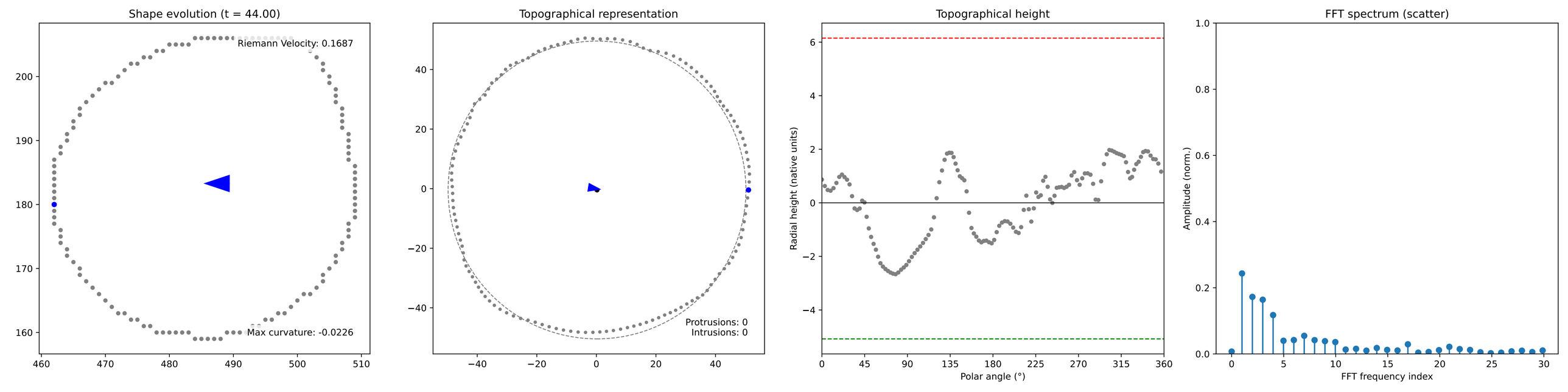

FFT spectrum (scatter)
Amplitude (norm.)
FFT frequency index
1.0
0.8
0.6
0.4
0.2
0.0
0
5
10
15
20
25
30

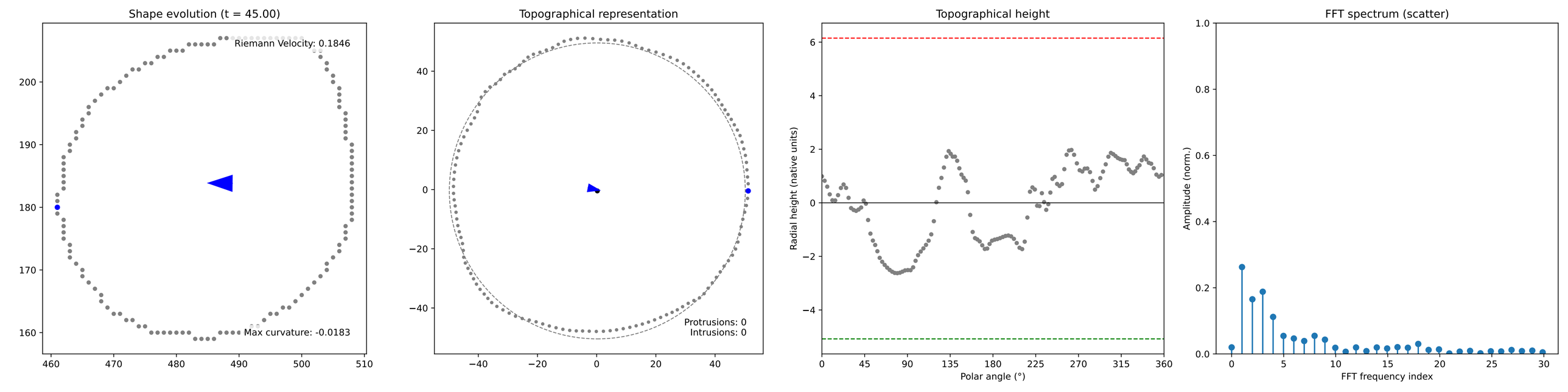

Shape evolution (t = 40.00)
Riemann Velocity: 0.1886
Max curvature: -0.0320
Topographical representation
Protrusions: 0
Intrusions: 0
Topographical height
Radial height (native units)
Polar angle (°)
FFT spectrum (scatter)
Amplitude (norm.)
FFT frequency index

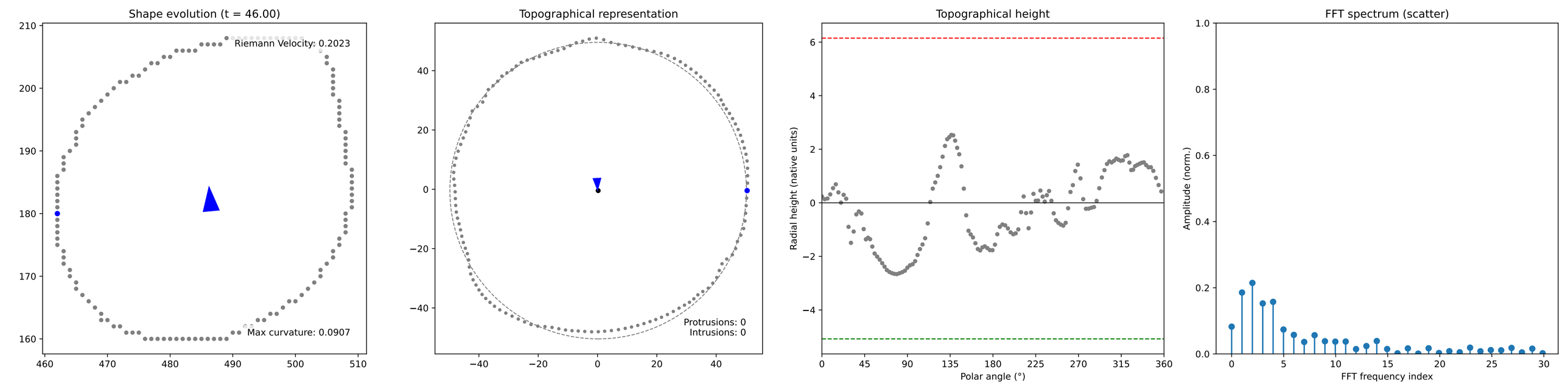

Shape evolution (t = 41.00)
Riemann Velocity: 0.1877
Max curvature: -0.0261
Topographical representation
Protrusions: 0
Intrusions: 0
Topographical height
Radial height (native units)
Polar angle (°)
FFT spectrum (scatter)
Amplitude (norm.)
FFT frequency index

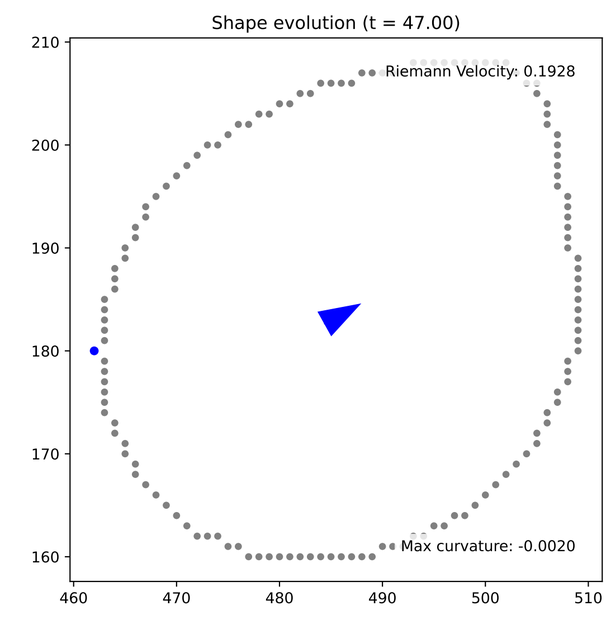

Shape evolution (t = 42.00)
Riemann Velocity: 0.1881
Max curvature: -0.0294
Topographical representation
Protrusions: 0
Intrusions: 0
Topographical height
Radial height (native units)
Polar angle (°)
FFT spectrum (scatter)
Amplitude (norm.)
FFT frequency index

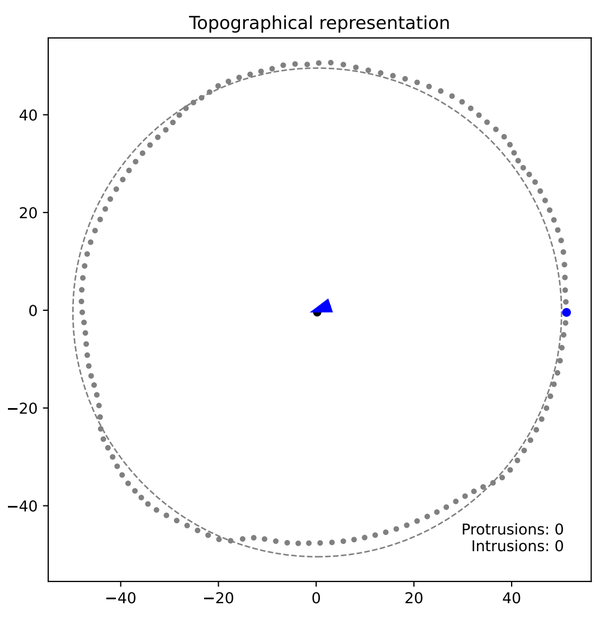

Shape evolution (t = 43.00)
Riemann Velocity: 0.1907
Max curvature: -0.0245
Topographical representation
Protrusions: 0
Intrusions: 0
Topographical height
Radial height (native units)
Polar angle (°)
FFT spectrum (scatter)
Amplitude (norm.)
FFT frequency index

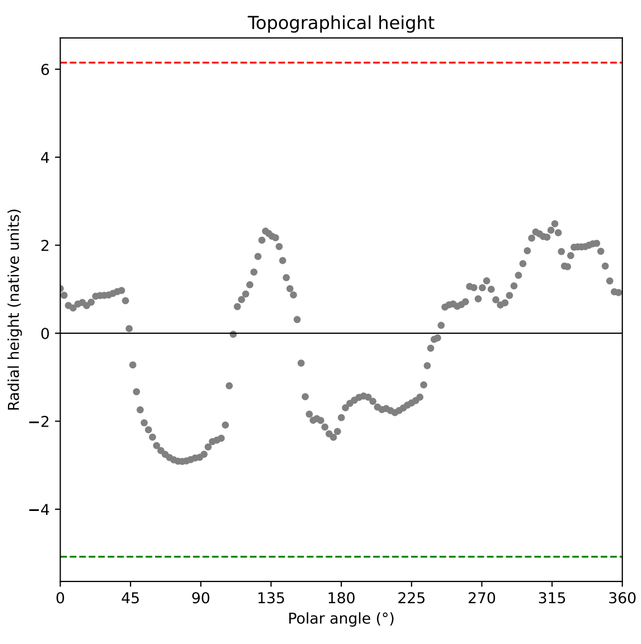

Shape evolution (t = 44.00)
Riemann Velocity: 0.1687
Max curvature: -0.0226
Topographical representation
Protrusions: 0
Intrusions: 0
Topographical height
Radial height (native units)
Polar angle (°)
FFT spectrum (scatter)
Amplitude (norm.)
FFT frequency index

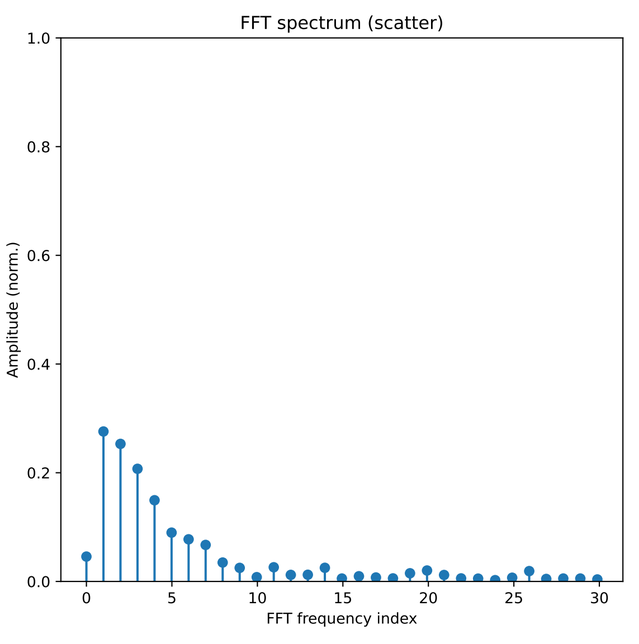

Shape evolution (t = 45.00)
Riemann Velocity: 0.1846
Max curvature: -0.0183
Topographical representation
Protrusions: 0
Intrusions: 0
Topographical height
Radial height (native units)
Polar angle (°)
FFT spectrum (scatter)
Amplitude (norm.)
FFT frequency index

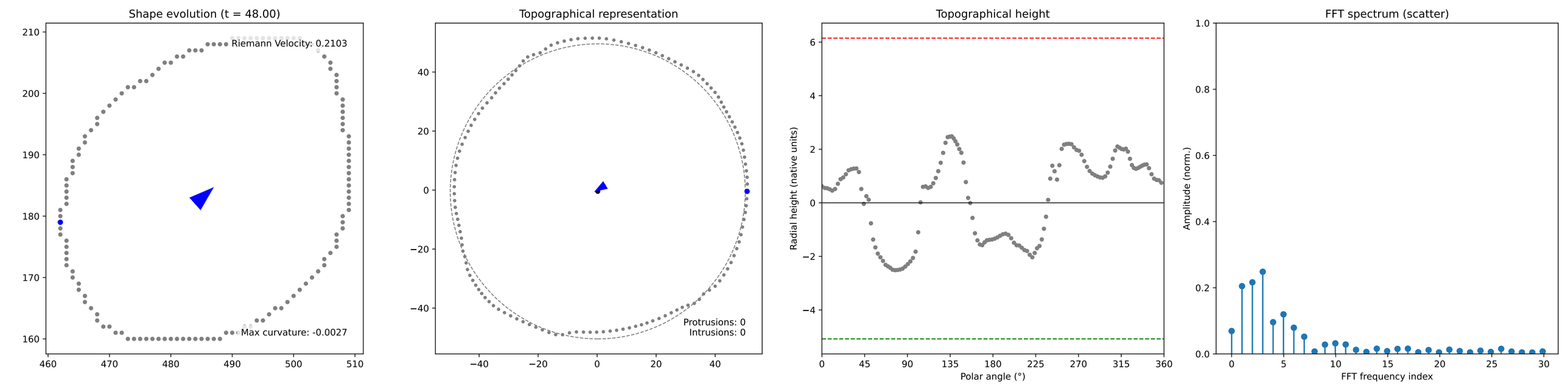

Shape evolution (t = 46.00)
Riemann Velocity: 0.2023
Max curvature: 0.0907
Topographical representation
Protrusions: 0
Intrusions: 0
Topographical height
Radial height (native units)
Polar angle (°)
FFT spectrum (scatter)
Amplitude (norm.)
FFT frequency index

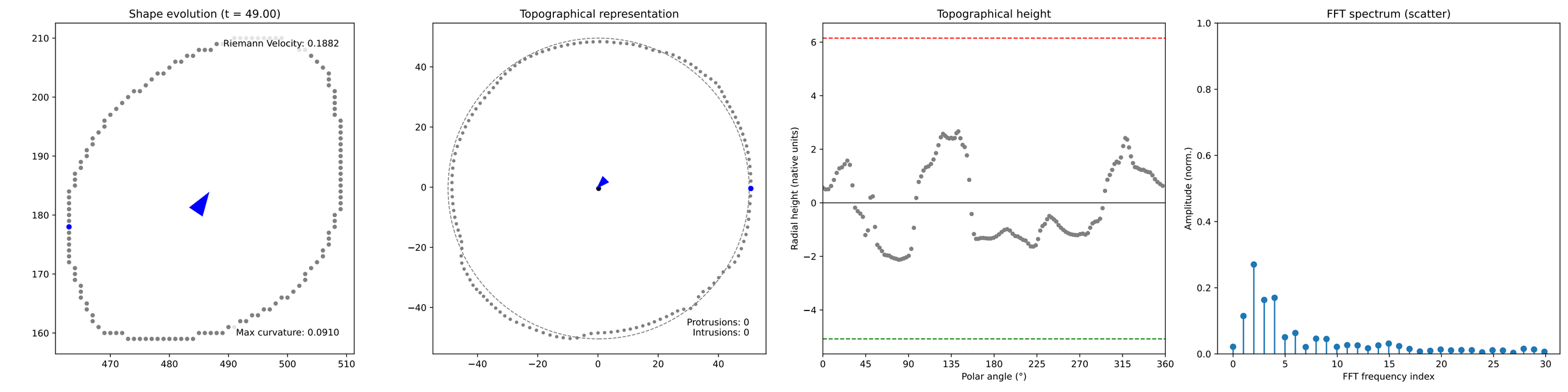

Shape evolution (t = 47.00)
Riemann Velocity: 0.1928
Max curvature: -0.0020

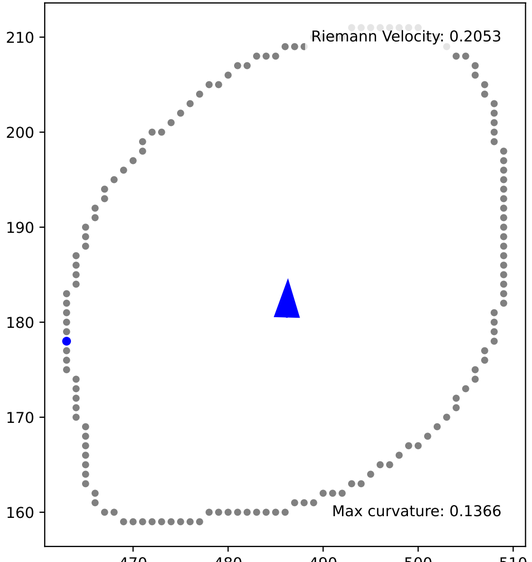

Topographical representation
Protrusions: 0
Intrusions: 0

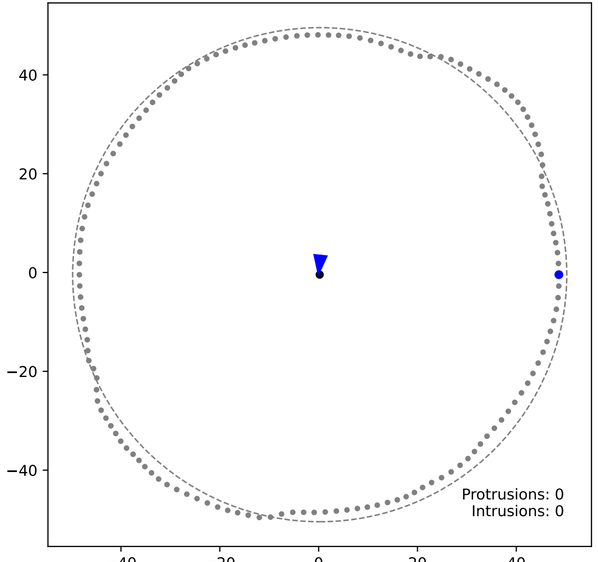

Topographical height
Radial height (native units)
Polar angle (°)

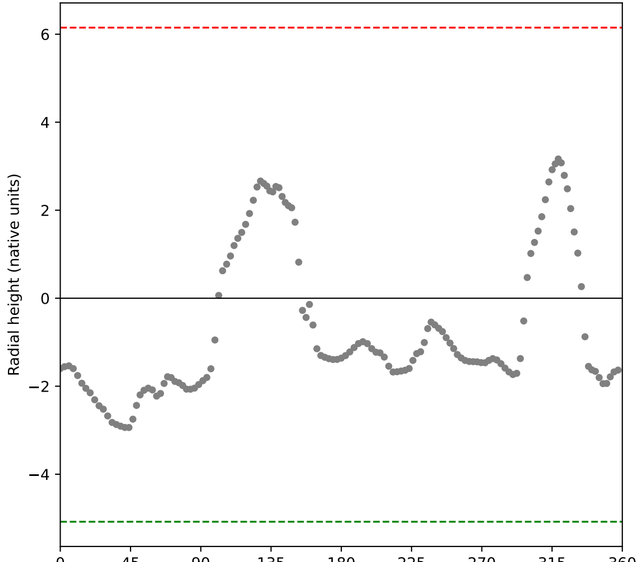

FFT spectrum (scatter)
Amplitude (norm.)
FFT frequency index

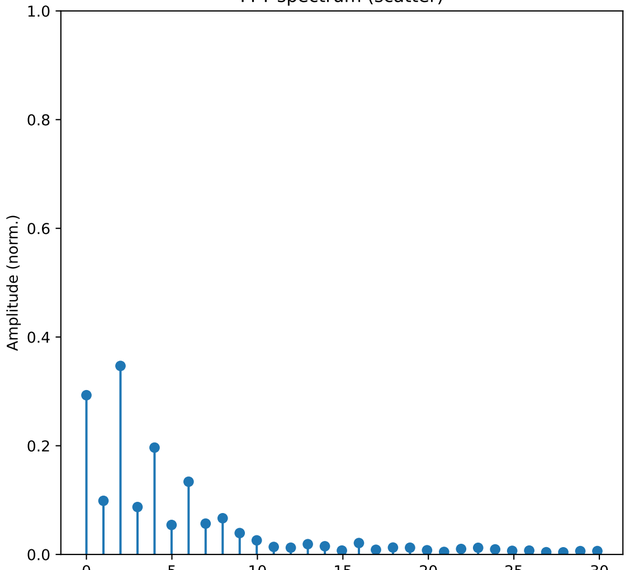

Shape evolution (t = 48.00)
Riemann Velocity: 0.2103
Max curvature: -0.0027
Topographical representation
Protrusions: 0
Intrusions: 0
Topographical height
Radial height (native units)
Polar angle (°)
FFT spectrum (scatter)
Amplitude (norm.)
FFT frequency index

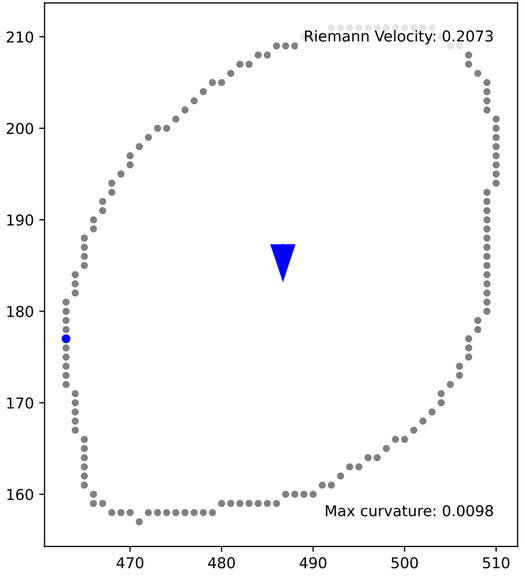

Shape evolution (t = 49.00)
Riemann Velocity: 0.1882
Max curvature: 0.0910
Topographical representation
Protrusions: 0
Intrusions: 0
Topographical height
Radial height (native units)
Polar angle (°)
FFT spectrum (scatter)
Amplitude (norm.)
FFT frequency index

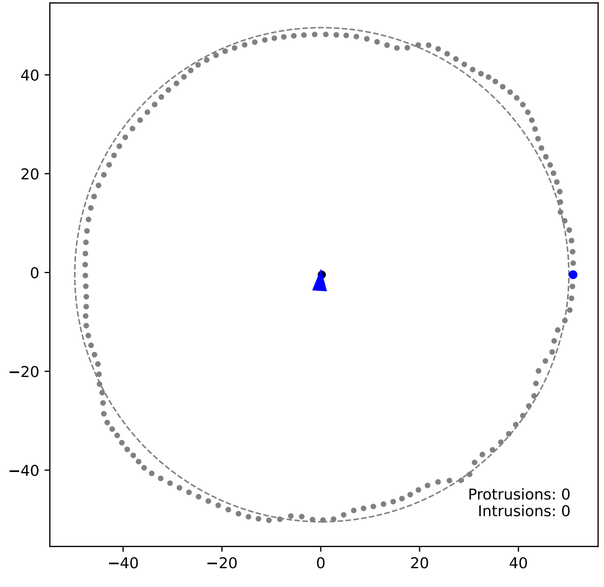

Shape evolution (t = 50.00)
Riemann Velocity: 0.2053
Max curvature: 0.1366
210
200
190
180
170
160
470
480
490
500
510

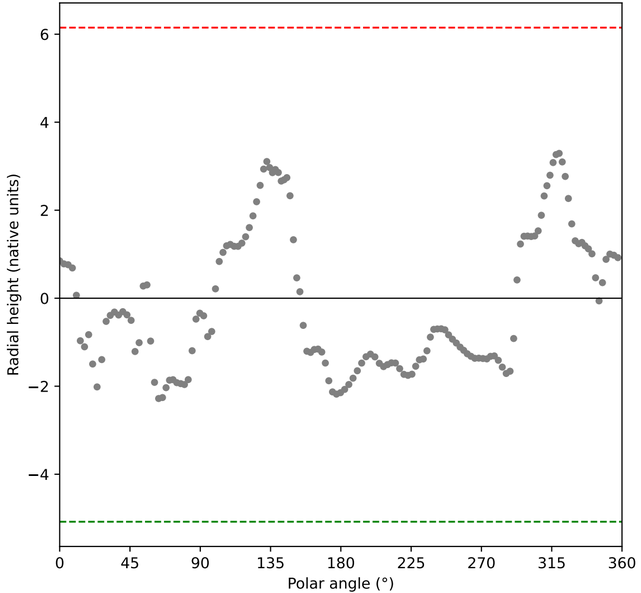

Topographical representation
Protrusions: 0
Intrusions: 0
40
20
0
−20
−40
−40
−20
0
20
40

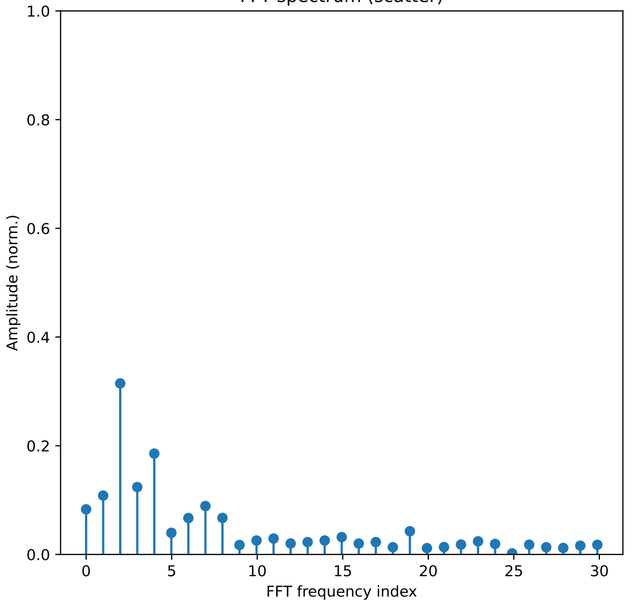

Topographical height
Radial height (native units)
Polar angle (°)
6
4
2
0
−2
−4
0
45
90
135
180
225
270
315
360

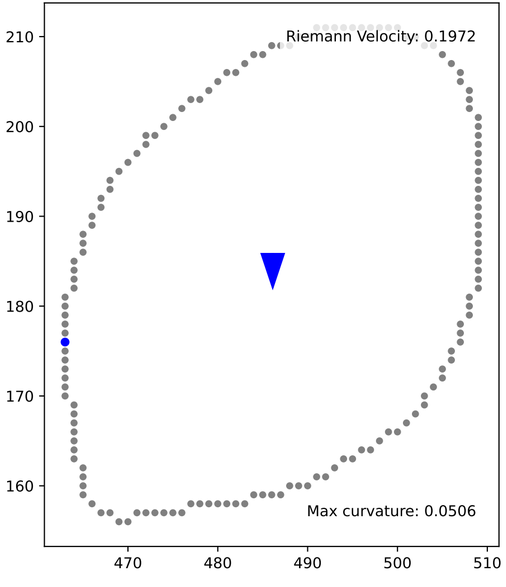

FFT spectrum (scatter)
Amplitude (norm.)
FFT frequency index
1.0
0.8
0.6
0.4
0.2
0.0
0
5
10
15
20
25
30

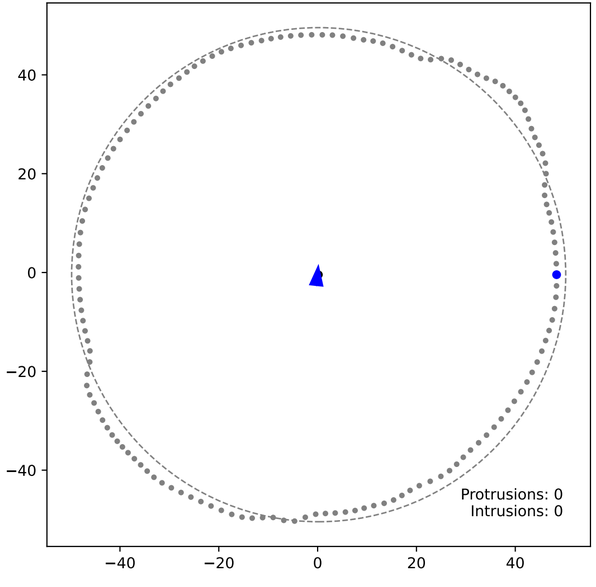

Shape evolution (t = 51.00)
Riemann Velocity: 0.2073
Max curvature: 0.0098
210
200
190
180
170
160
470
480
490
500
510

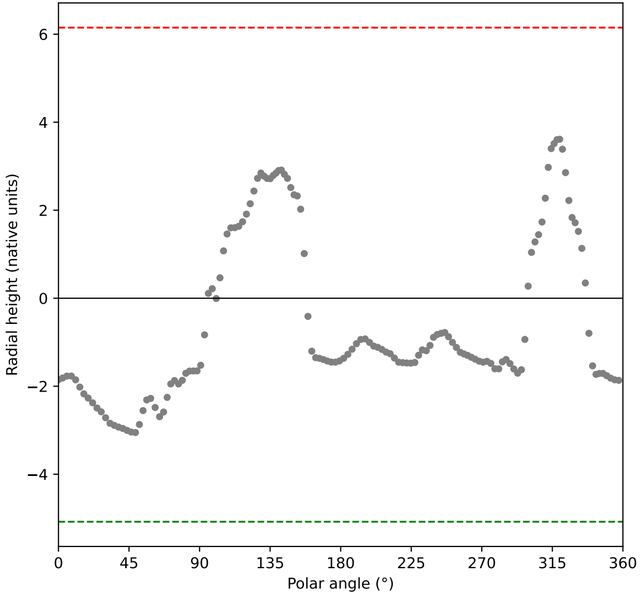

Topographical representation
Protrusions: 0
Intrusions: 0
40
20
0
−20
−40
−40
−20
0
20
40

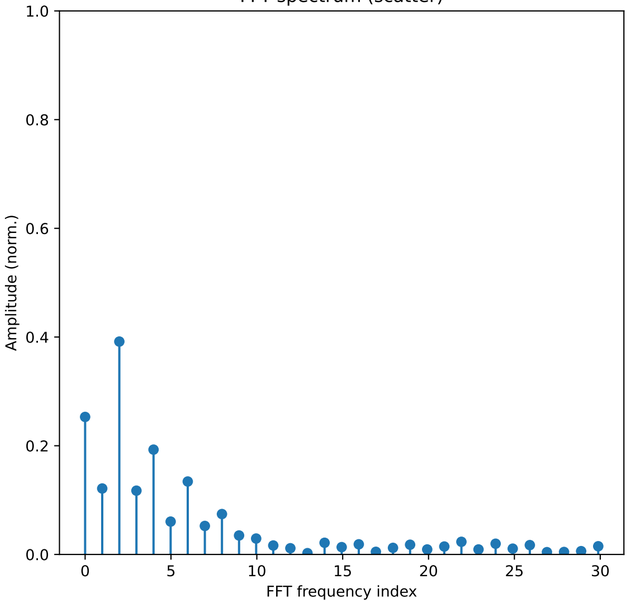

Topographical height
Radial height (native units)
Polar angle (°)
6
4
2
0
−2
−4
0
45
90
135
180
225
270
315
360

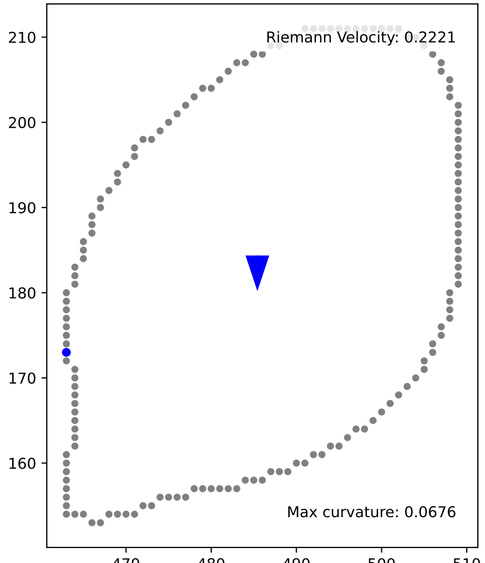

FFT spectrum (scatter)
Amplitude (norm.)
FFT frequency index
1.0
0.8
0.6
0.4
0.2
0.0
0
5
10
15
20
25
30

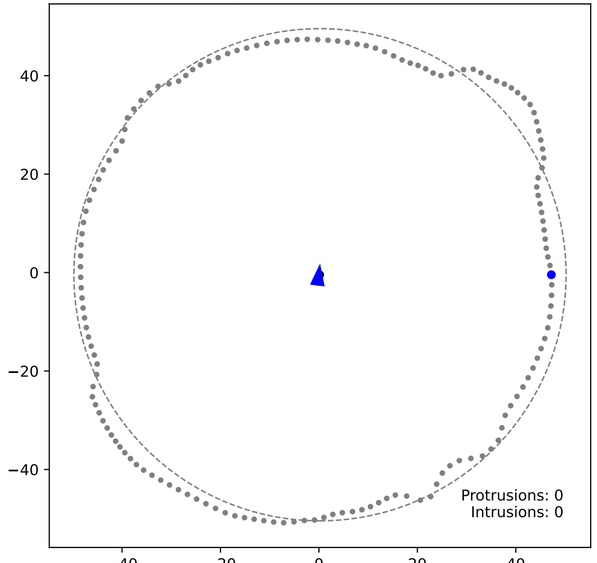

Shape evolution (t = 52.00)
Riemann Velocity: 0.1972
Max curvature: 0.0506
210
200
190
180
170
160
470
480
490
500
510

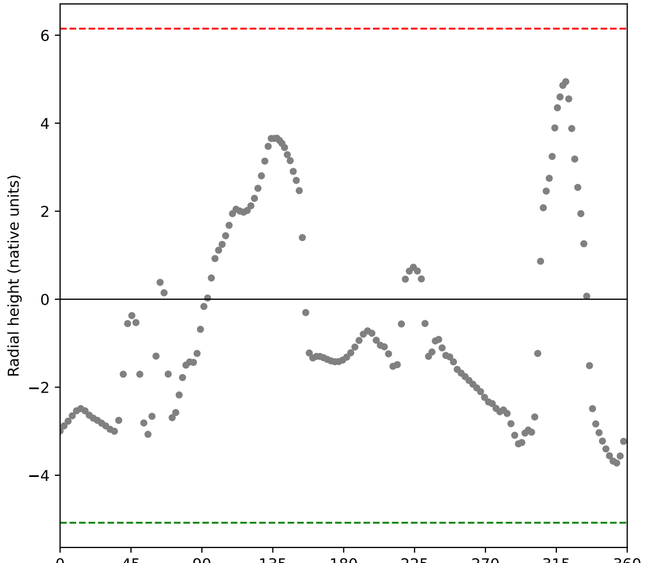

Topographical representation
Protrusions: 0
Intrusions: 0
40
20
0
−20
−40
−40
−20
0
20
40

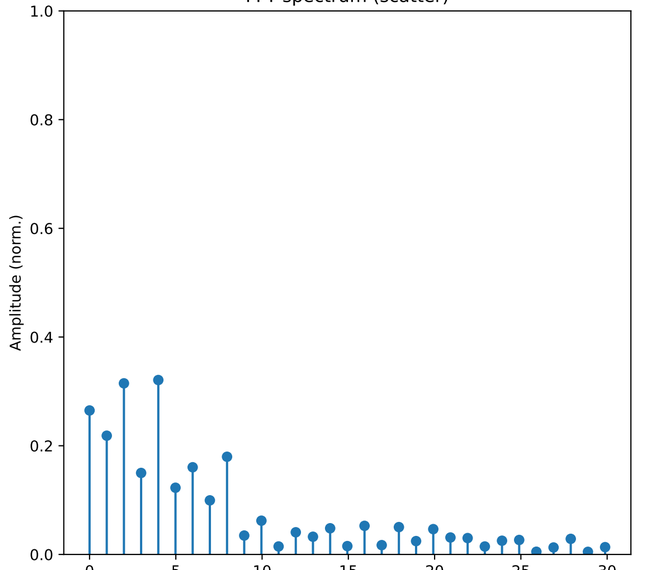

Topographical height
Radial height (native units)
Polar angle (°)
6
4
2
0
−2
−4
0
45
90
135
180
225
270
315
360

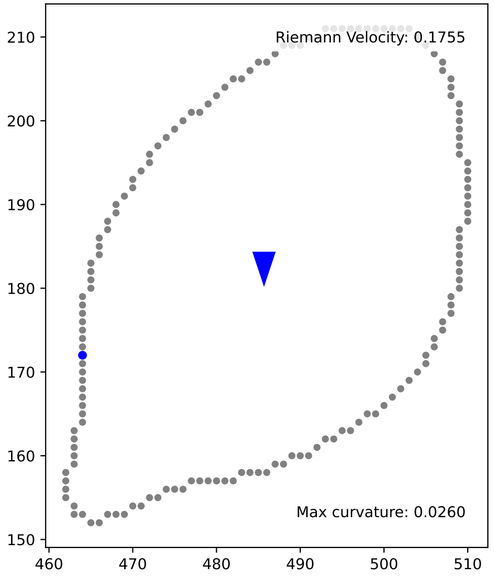

FFT spectrum (scatter)
Amplitude (norm.)
FFT frequency index
1.0
0.8
0.6
0.4
0.2
0.0
0
5
10
15
20
25
30

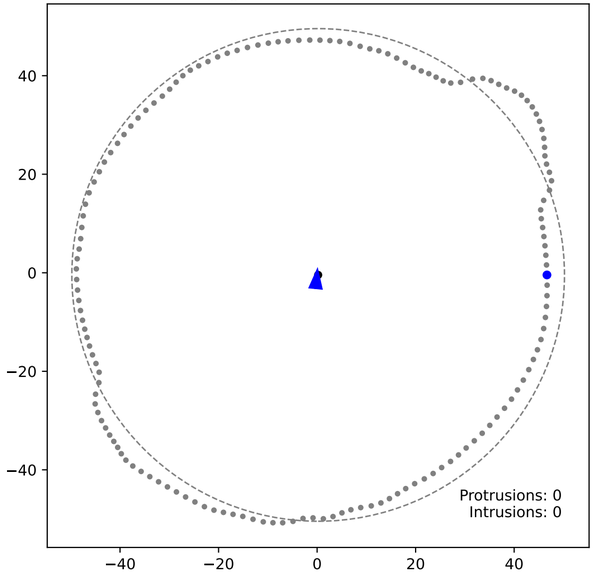

Shape evolution (t = 53.00)
Riemann Velocity: 0.2221
Max curvature: 0.0676
210
200
190
180
170
160
470
480
490
500
510

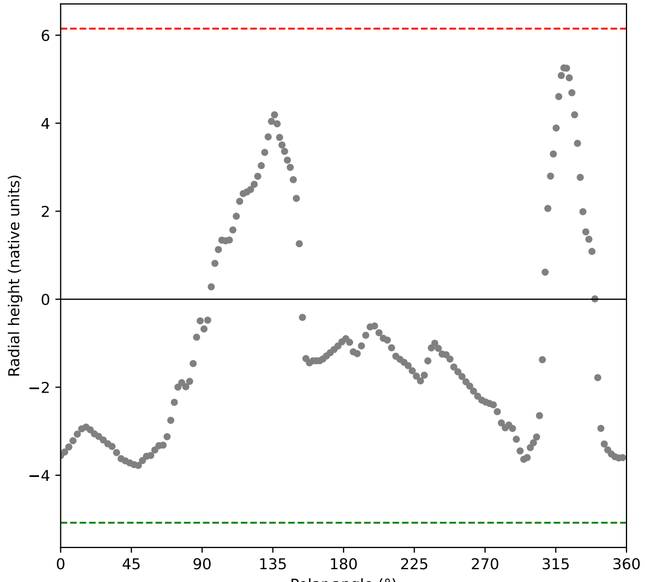

Topographical representation
Protrusions: 0
Intrusions: 0
40
20
0
−20
−40
−40
−20
0
20
40

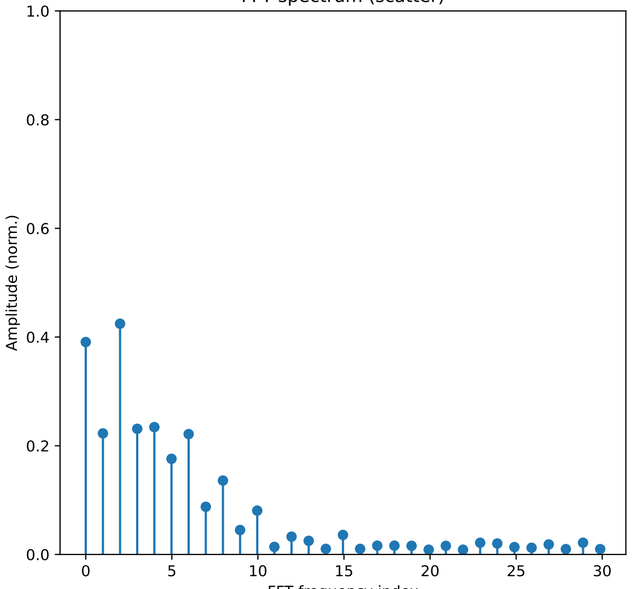

Topographical height
Radial height (native units)
Polar angle (°)
6
4
2
0
−2
−4
0
45
90
135
180
225
270
315
360

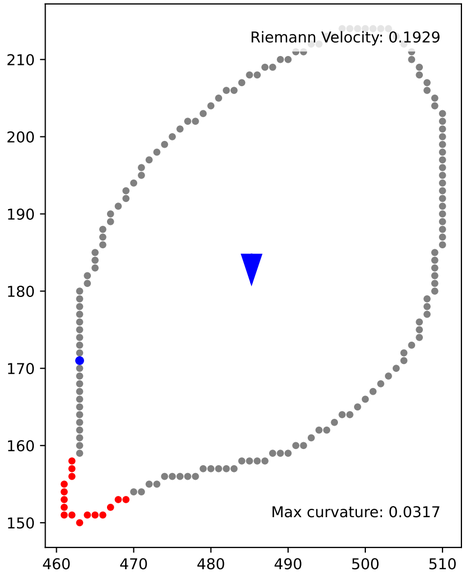

FFT spectrum (scatter)
Amplitude (norm.)
FFT frequency index
1.0
0.8
0.6
0.4
0.2
0.0
0
5
10
15
20
25
30

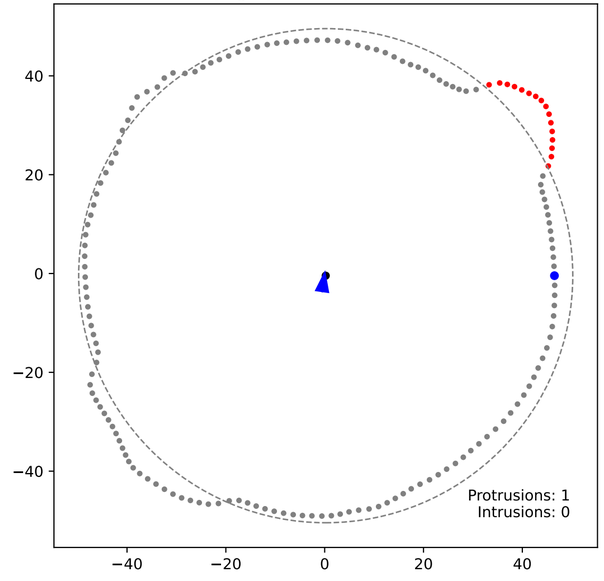

Shape evolution (t = 54.00)
Riemann Velocity: 0.1755
Max curvature: 0.0260

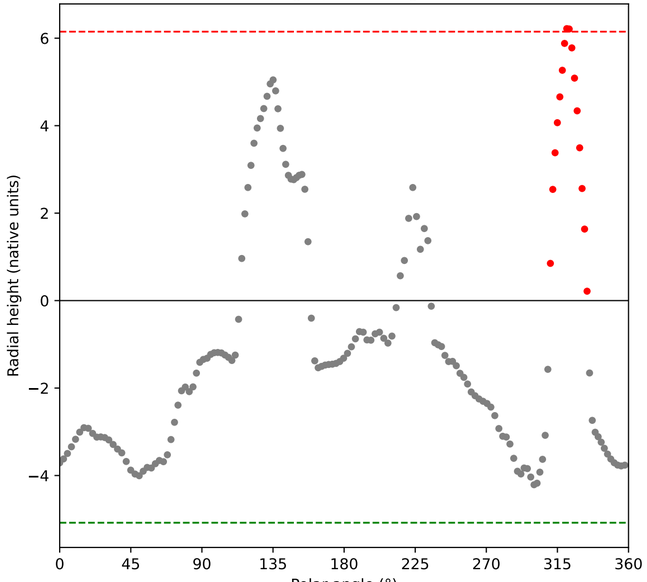

Topographical representation
Protrusions: 0
Intrusions: 0

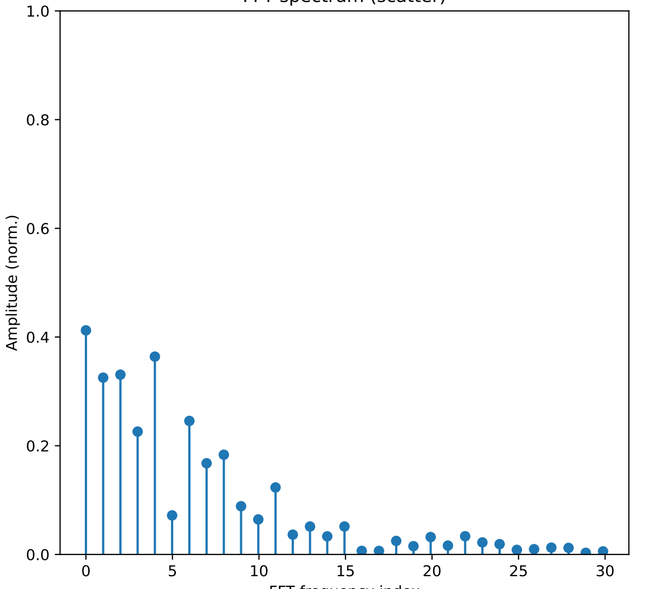

Topographical height
Radial height (native units)
Polar angle (°)

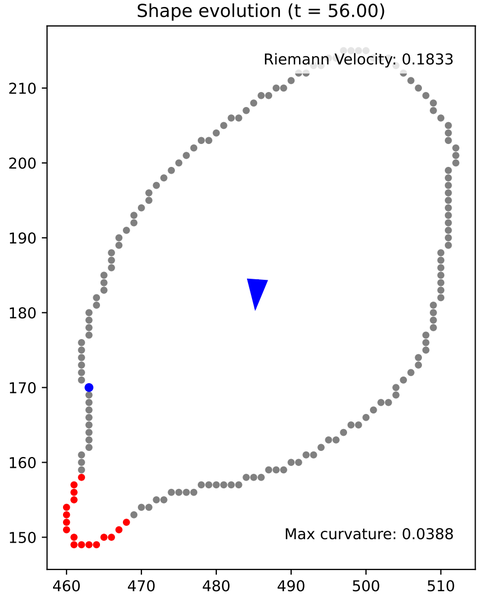

FFT spectrum (scatter)
Amplitude (norm.)
FFT frequency index

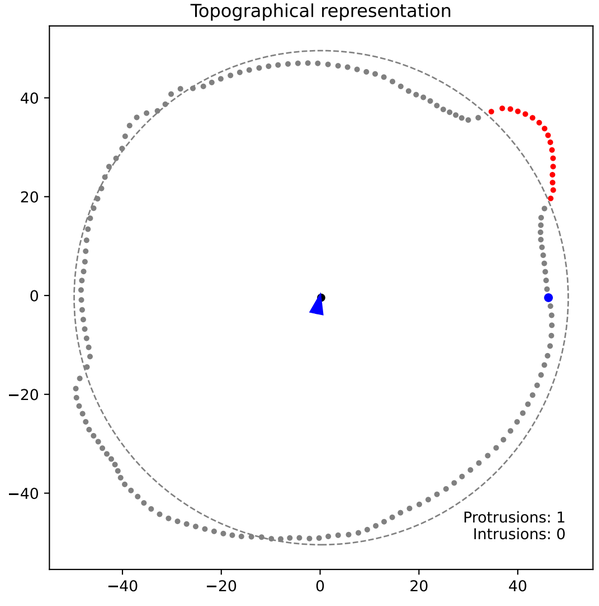

Shape evolution (t = 55.00)
Riemann Velocity: 0.1929
Max curvature: 0.0317
210
200
190
180
170
160
150
460
470
480
490
500
510

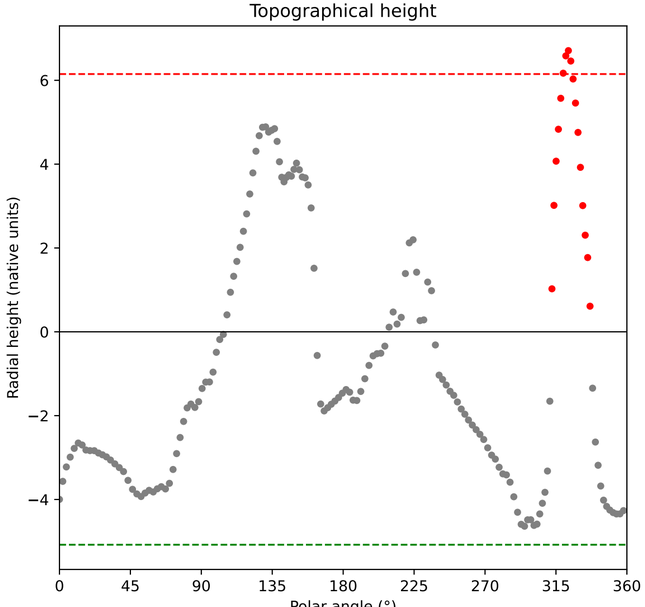

Topographical representation
Protrusions: 1
Intrusions: 0
40
20
0
−20
−40
−40
−20
0
20
40

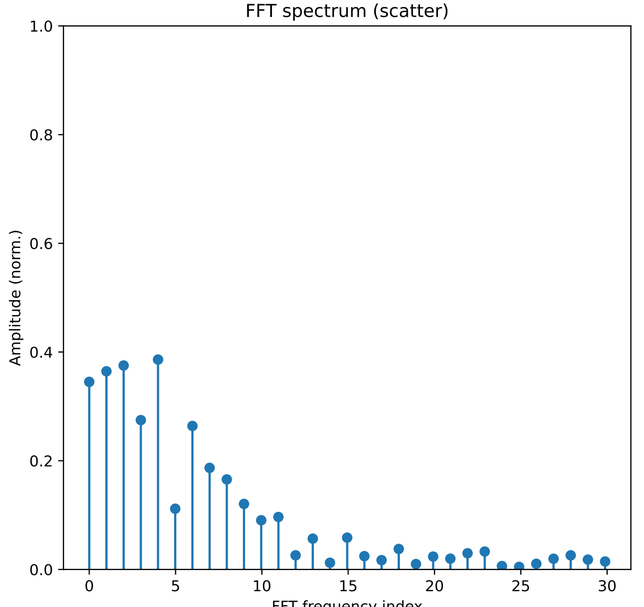

Topographical height
Radial height (native units)
Polar angle (°)
6
4
2
0
−2
−4
0
45
90
135
180
225
270
315
360

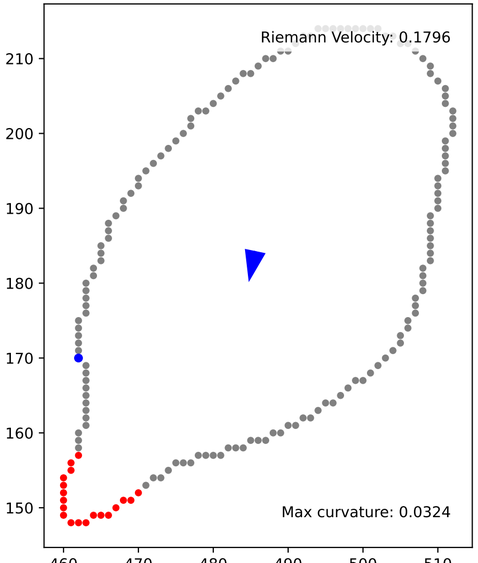

FFT spectrum (scatter)
Amplitude (norm.)
FFT frequency index
1.0
0.8
0.6
0.4
0.2
0.0
0
5
10
15
20
25
30

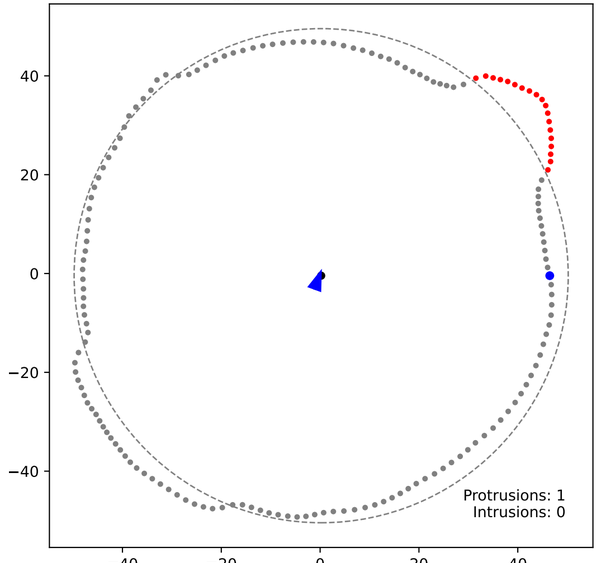

Shape evolution (t = 56.00)
Riemann Velocity: 0.1833
Max curvature: 0.0388
210
200
190
180
170
160
150
460
470
480
490
500
510

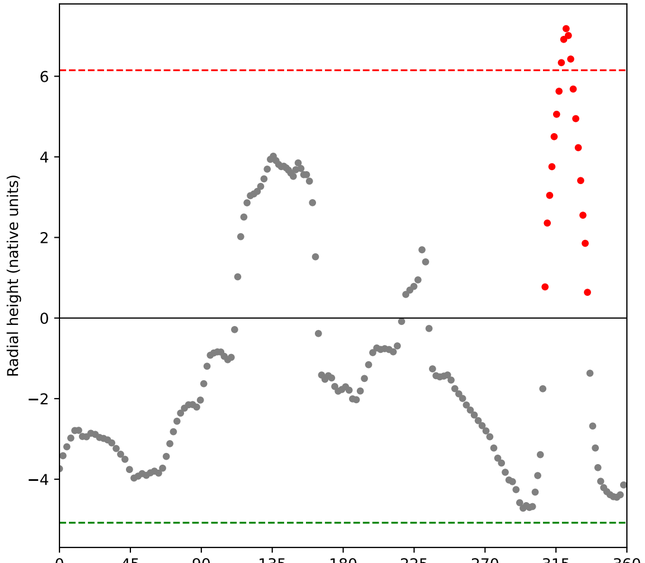

Topographical representation
Protrusions: 1
Intrusions: 0
40
20
0
−20
−40
−40
−20
0
20
40

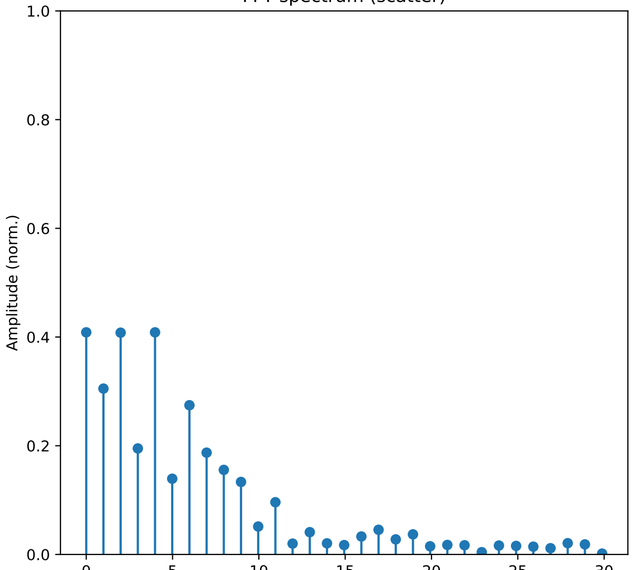

Topographical height
Radial height (native units)
Polar angle (°)
6
4
2
0
−2
−4
0
45
90
135
180
225
270
315
360

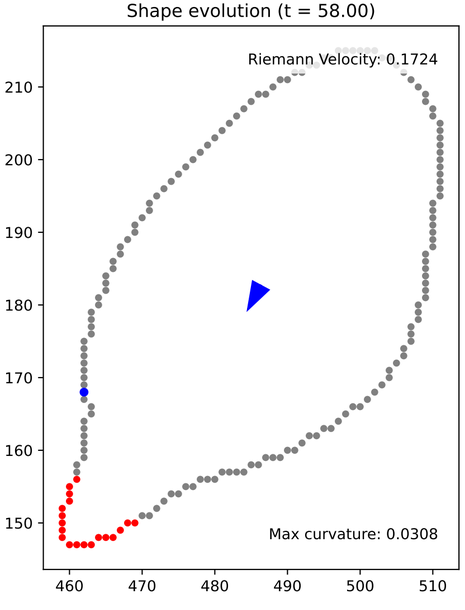

FFT spectrum (scatter)
Amplitude (norm.)
FFT frequency index
1.0
0.8
0.6
0.4
0.2
0.0
0
5
10
15
20
25
30

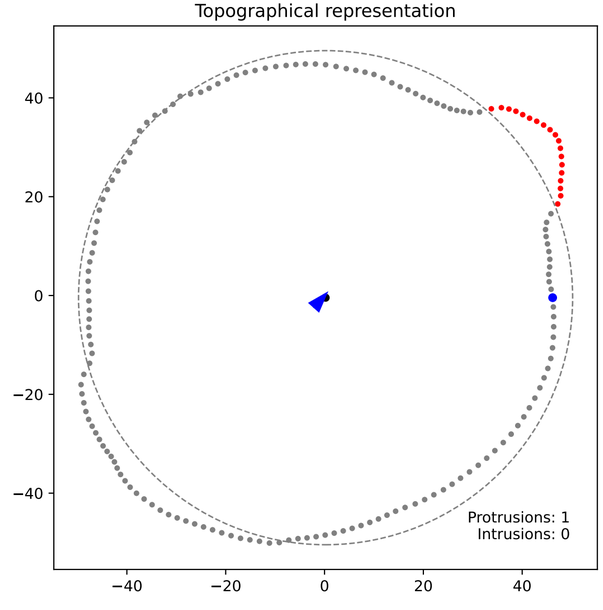

Shape evolution (t = 57.00)
Riemann Velocity: 0.1796
Max curvature: 0.0324
210
200
190
180
170
160
150
460
470
480
490
500
510

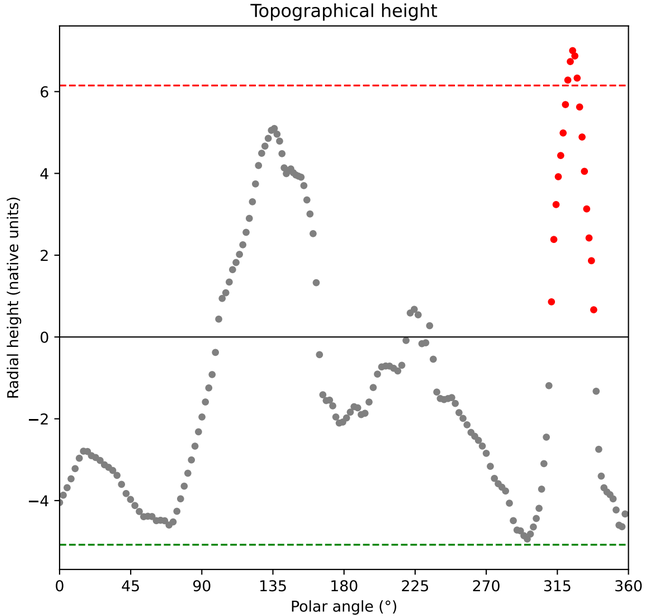

Topographical representation
Protrusions: 1
Intrusions: 0
40
20
0
−20
−40
−40
−20
0
20
40

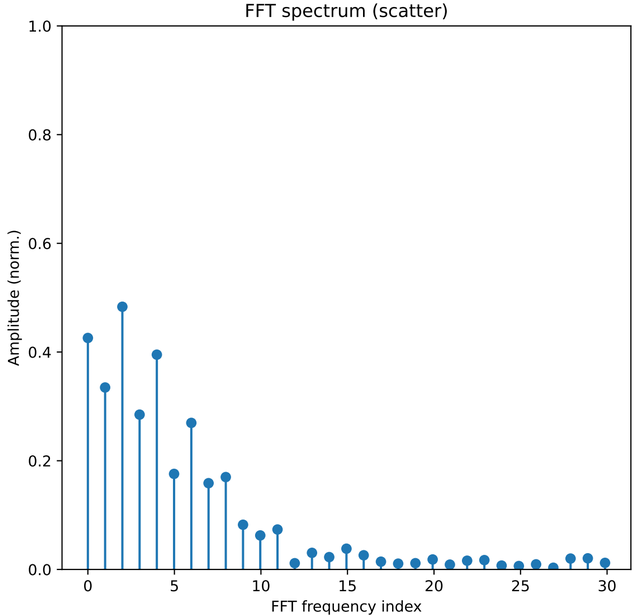

Topographical height
Radial height (native units)
Polar angle (°)
6
4
2
0
−2
−4
0
45
90
135
180
225
270
315
360

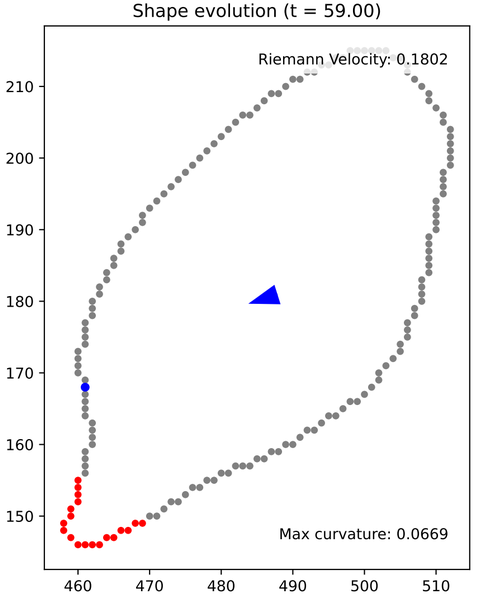

FFT spectrum (scatter)
Amplitude (norm.)
FFT frequency index
1.0
0.8
0.6
0.4
0.2
0.0
0
5
10
15
20
25
30

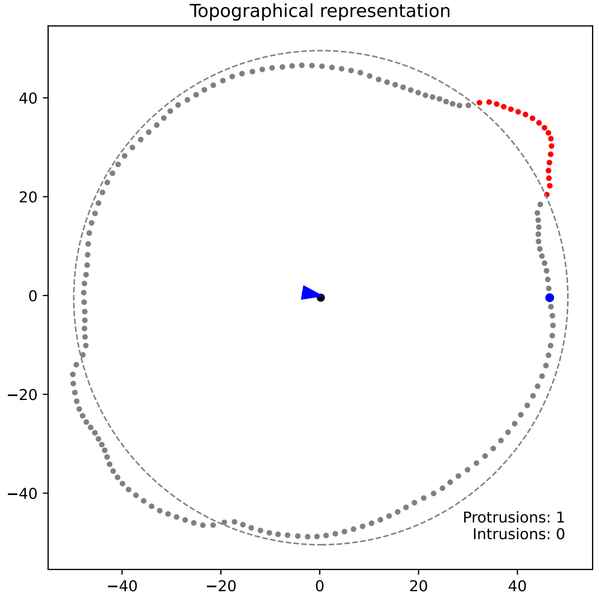

Shape evolution (t = 58.00)
Riemann Velocity: 0.1724
Max curvature: 0.0308
210
200
190
180
170
160
150
460
470
480
490
500
510

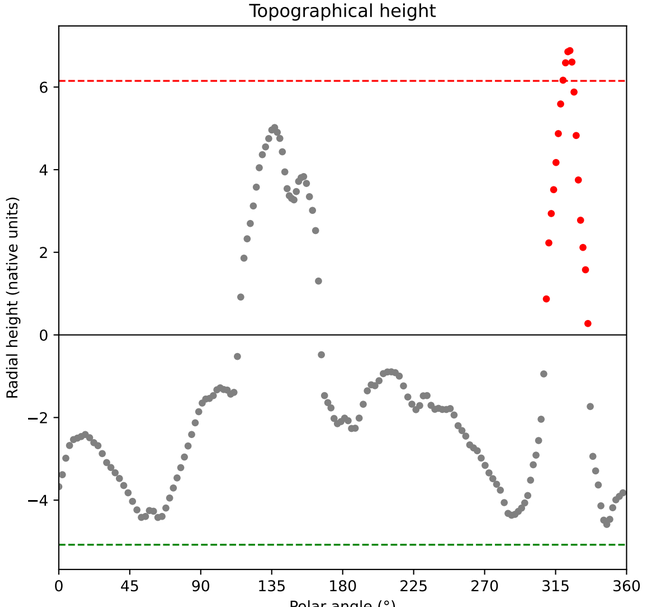

Topographical representation
Protrusions: 1
Intrusions: 0
40
20
0
−20
−40
−40
−20
0
20
40

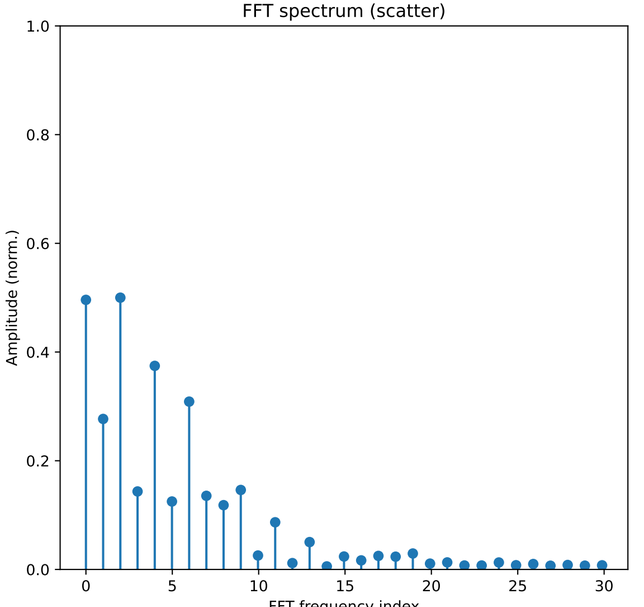

Topographical height
Radial height (native units)
Polar angle (°)
6
4
2
0
−2
−4
0
45
90
135
180
225
270
315
360

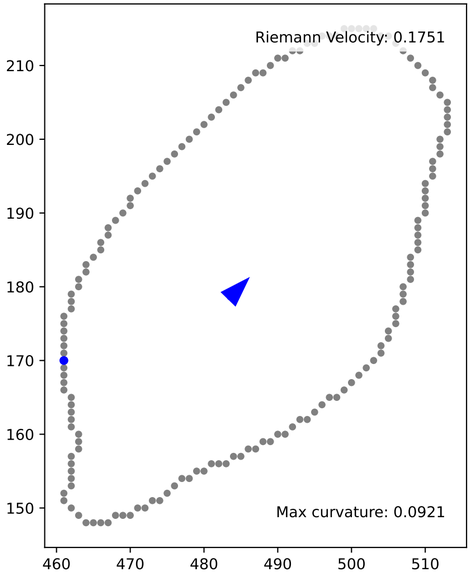

FFT spectrum (scatter)
Amplitude (norm.)
FFT frequency index
1.0
0.8
0.6
0.4
0.2
0.0
0
5
10
15
20
25
30

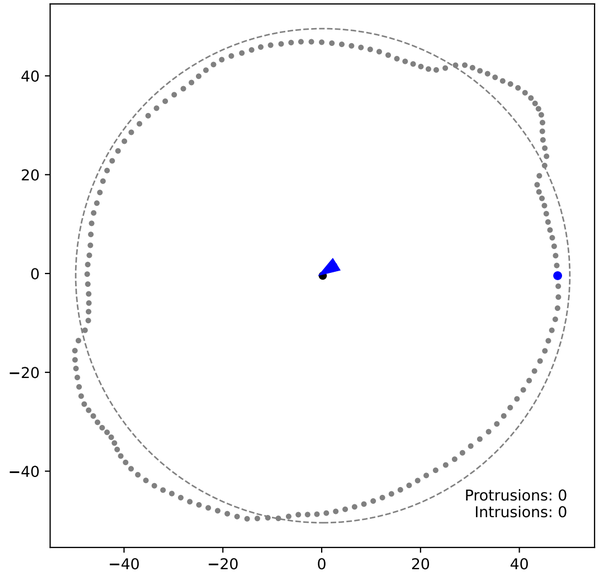

Shape evolution (t = 59.00)
Riemann Velocity: 0.1802
Max curvature: 0.0669
210
200
190
180
170
160
150
460
470
480
490
500
510

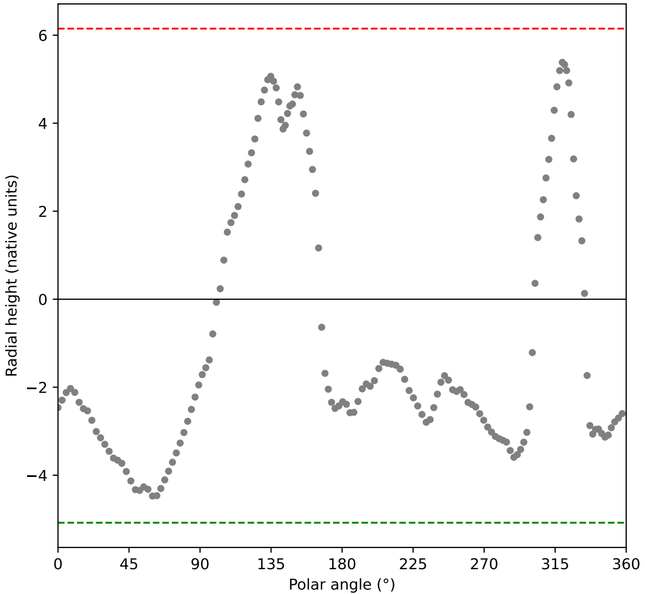

Topographical representation
Protrusions: 1
Intrusions: 0
40
20
0
−20
−40
−40
−20
0
20
40

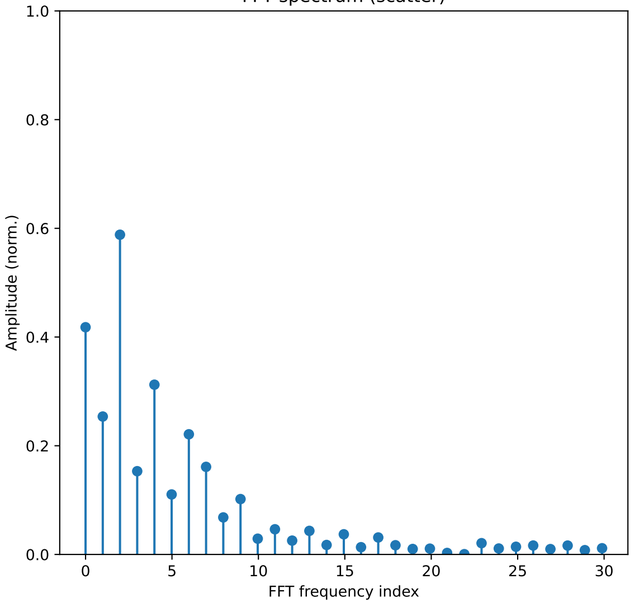

Topographical height
Radial height (native units)
Polar angle (°)
6
4
2
0
−2
−4
0
45
90
135
180
225
270
315
360

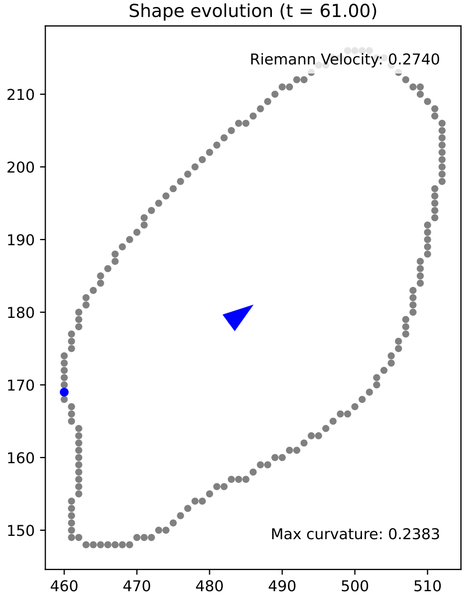

FFT spectrum (scatter)
Amplitude (norm.)
FFT frequency index
1.0
0.8
0.6
0.4
0.2
0.0
0
5
10
15
20
25
30

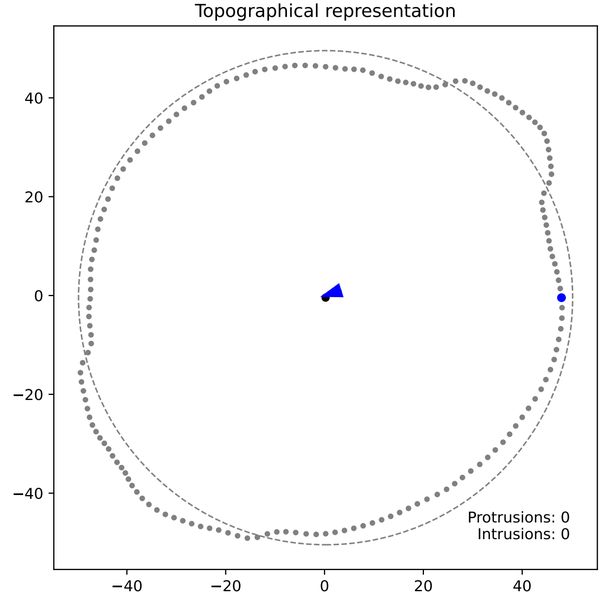

Shape evolution (t = 60.00)
Riemann Velocity: 0.1751
Max curvature: 0.0921
210
200
190
180
170
160
150
460
470
480
490
500
510

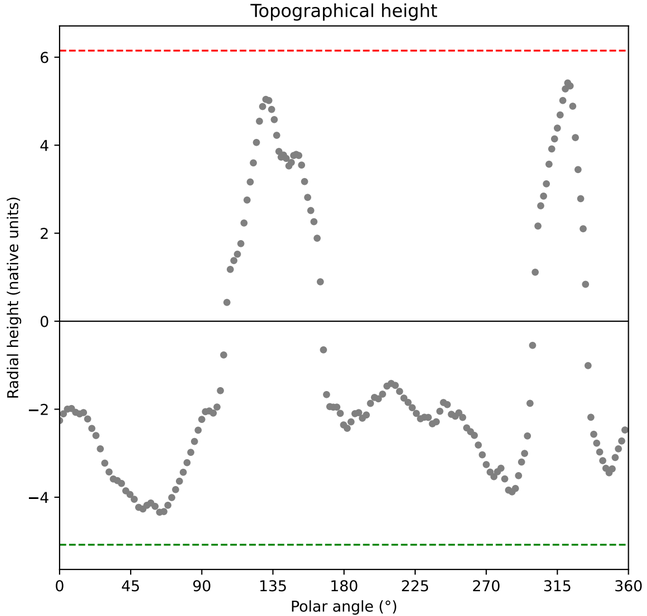

Topographical representation
Protrusions: 0
Intrusions: 0
40
20
0
−20
−40
−40
−20
0
20
40

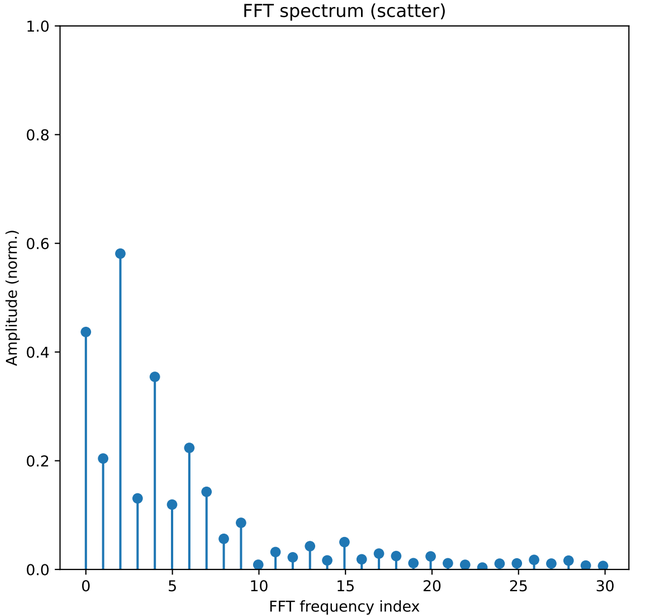

Topographical height
Radial height (native units)
Polar angle (°)
6
4
2
0
−2
−4
0
45
90
135
180
225
270
315
360

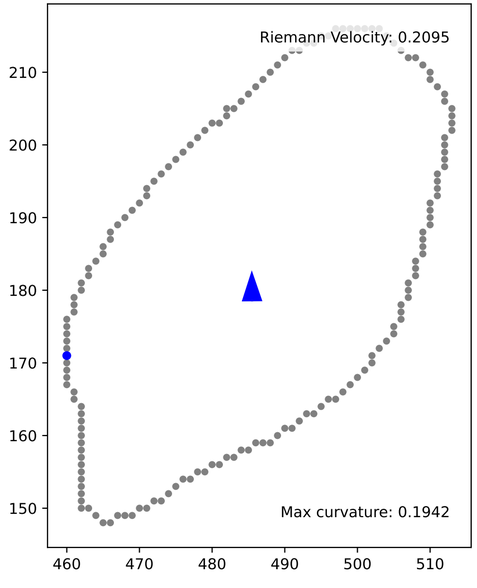

FFT spectrum (scatter)
Amplitude (norm.)
FFT frequency index
1.0
0.8
0.6
0.4
0.2
0.0
0
5
10
15
20
25
30

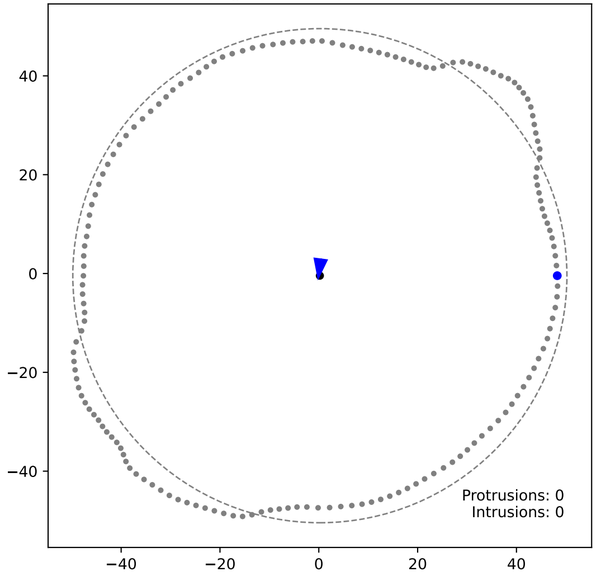

Shape evolution (t = 61.00)
Riemann Velocity: 0.2740
Max curvature: 0.2383
210
200
190
180
170
160
150
460
470
480
490
500
510

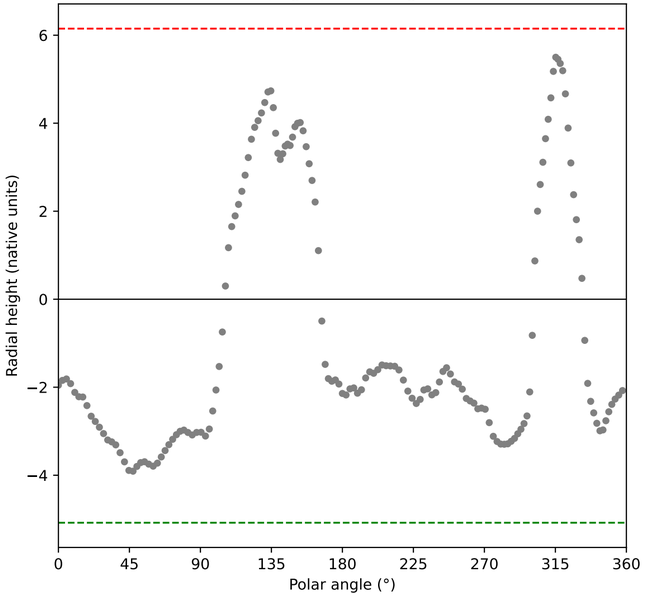

Topographical representation
Protrusions: 0
Intrusions: 0
40
20
0
−20
−40
−40
−20
0
20
40

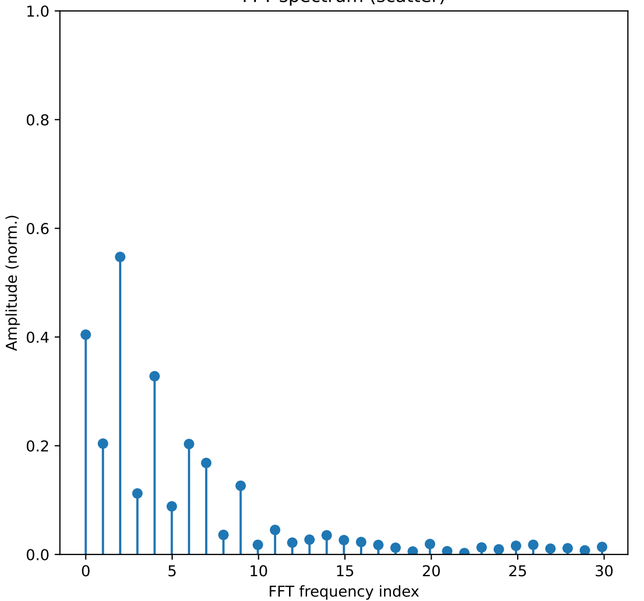

Topographical height
Radial height (native units)
Polar angle (°)
6
4
2
0
−2
−4
0
45
90
135
180
225
270
315
360

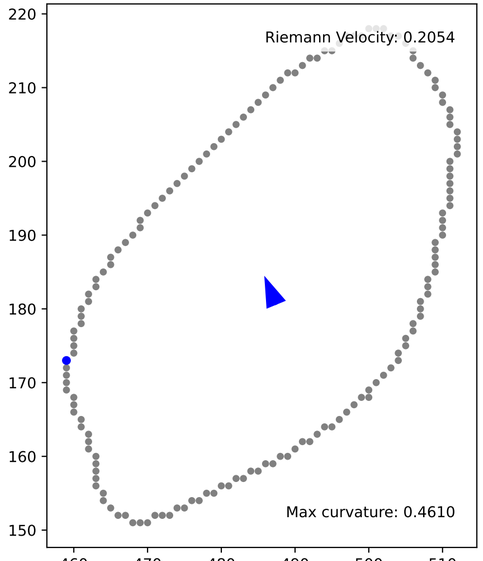

FFT spectrum (scatter)
Amplitude (norm.)
FFT frequency index
1.0
0.8
0.6
0.4
0.2
0.0
0
5
10
15
20
25
30

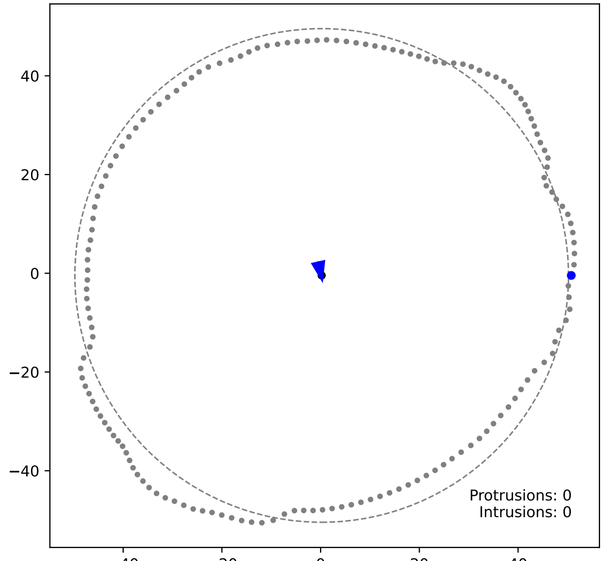

Shape evolution (t = 62.00)
Riemann Velocity: 0.2095
Max curvature: 0.1942
210
200
190
180
170
160
150
460
470
480
490
500
510

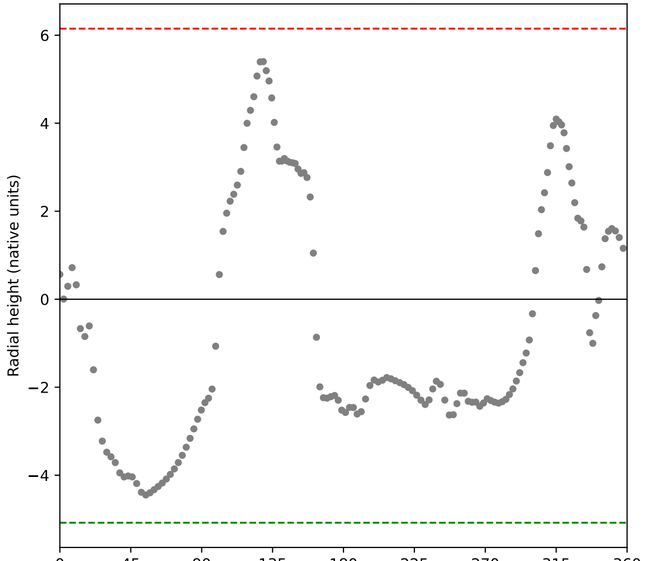

Topographical representation
Protrusions: 0
Intrusions: 0
40
20
0
−20
−40
−40
−20
0
20
40

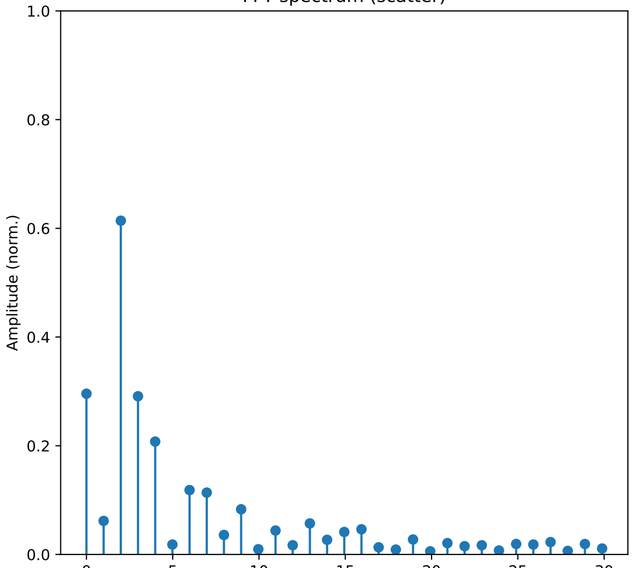

Topographical height
Radial height (native units)
Polar angle (°)
6
4
2
0
−2
−4
0
45
90
135
180
225
270
315
360

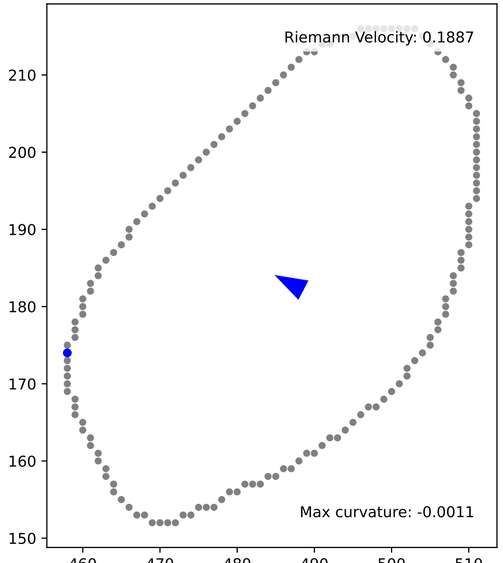

FFT spectrum (scatter)
Amplitude (norm.)
FFT frequency index
1.0
0.8
0.6
0.4
0.2
0.0
0
5
10
15
20
25
30

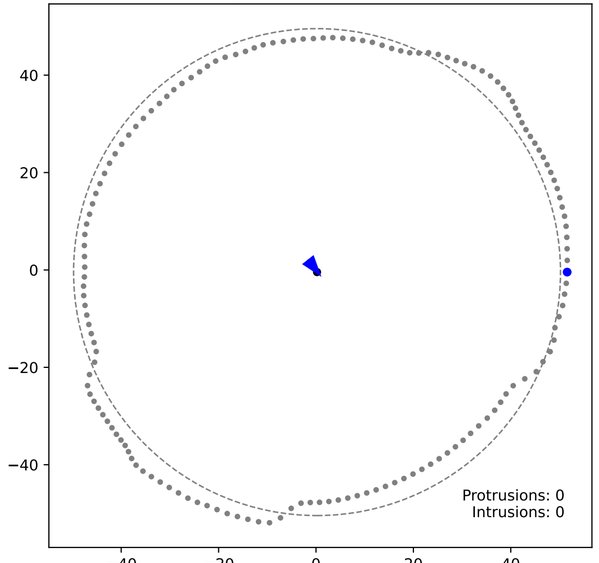

Shape evolution (t = 63.00)
Riemann Velocity: 0.2054
Max curvature: 0.4610

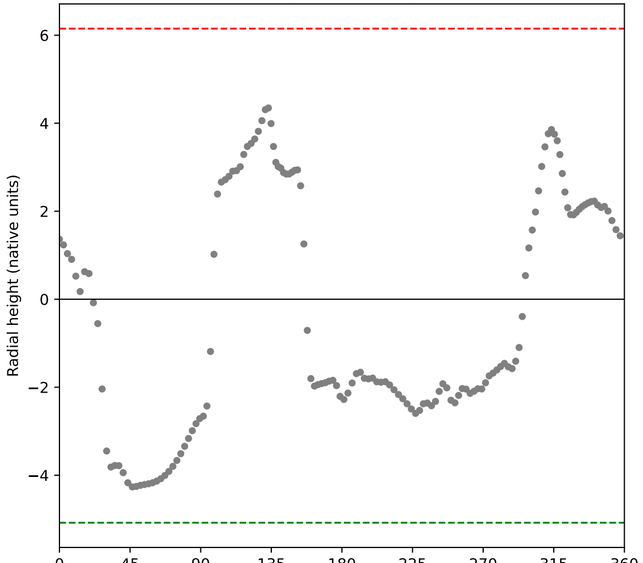

Topographical representation
Protrusions: 0
Intrusions: 0

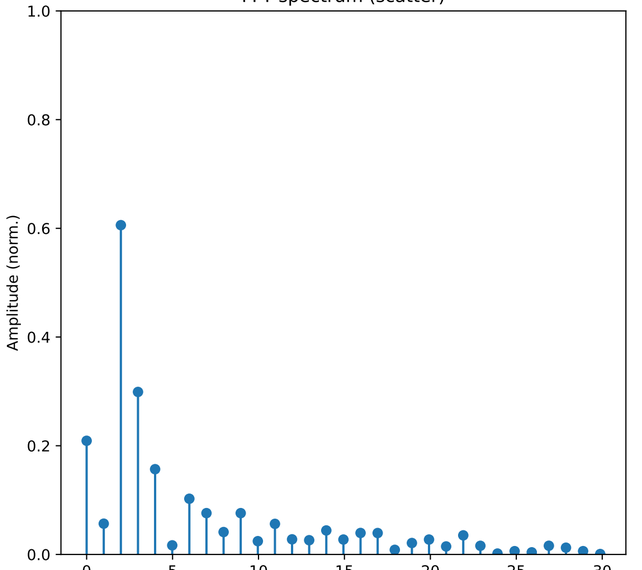

Topographical height
Radial height (native units)
Polar angle (°)

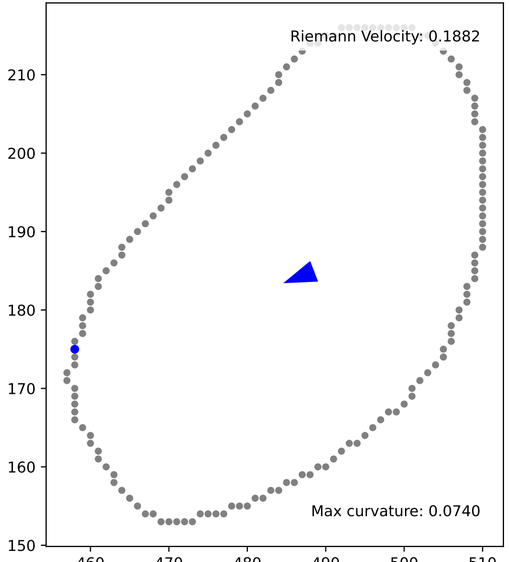

FFT spectrum (scatter)
Amplitude (norm.)
FFT frequency index

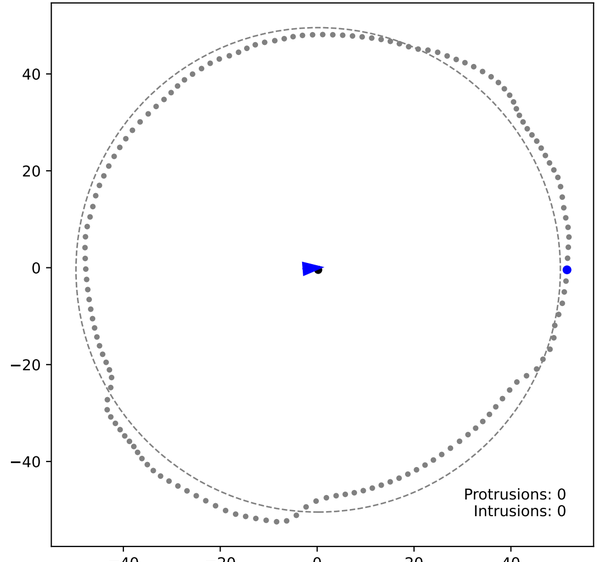

Shape evolution (t = 64.00)
Riemann Velocity: 0.1887
Max curvature: -0.0011
210
200
190
180
170
160
150
460
470
480
490
500
510

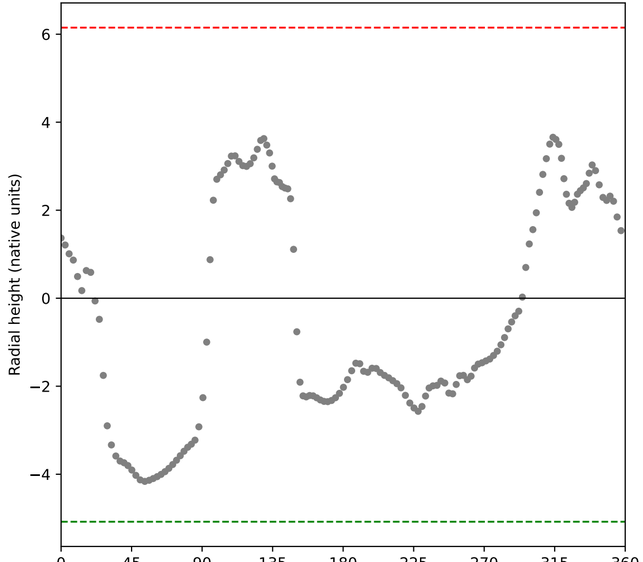

Topographical representation
Protrusions: 0
Intrusions: 0
40
20
0
−20
−40
−40
−20
0
20
40

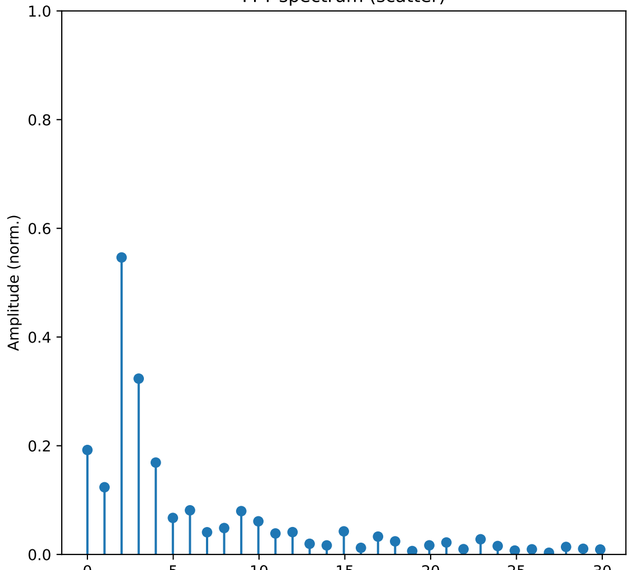

Topographical height
Radial height (native units)
Polar angle (°)
6
4
2
0
−2
−4
0
45
90
135
180
225
270
315
360

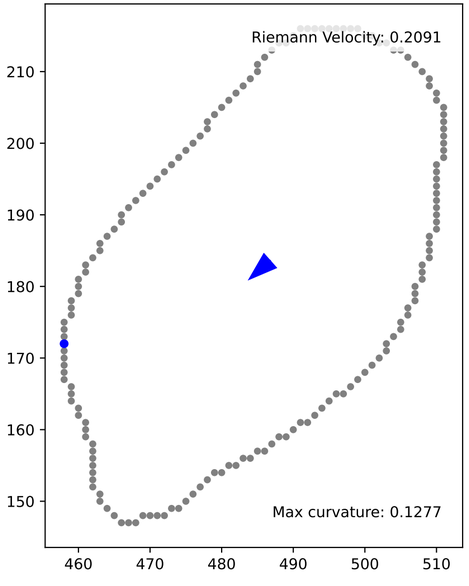

FFT spectrum (scatter)
Amplitude (norm.)
FFT frequency index
1.0
0.8
0.6
0.4
0.2
0.0
0
5
10
15
20
25
30

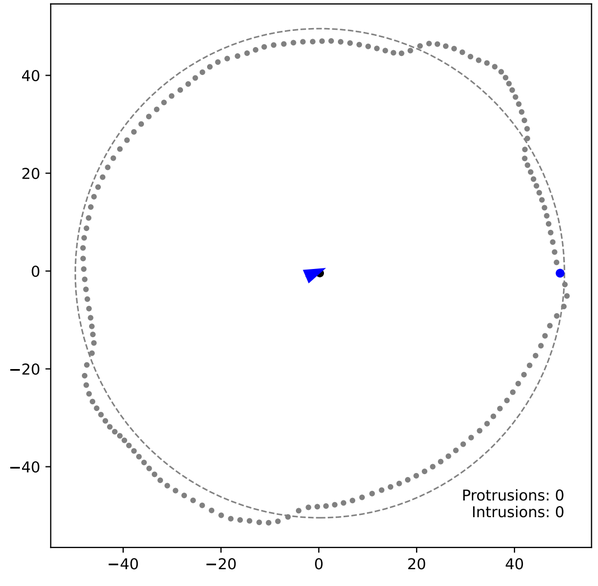

Shape evolution (t = 65.00)
Riemann Velocity: 0.1882
Max curvature: 0.0740
210
200
190
180
170
160
150
460
470
480
490
500
510

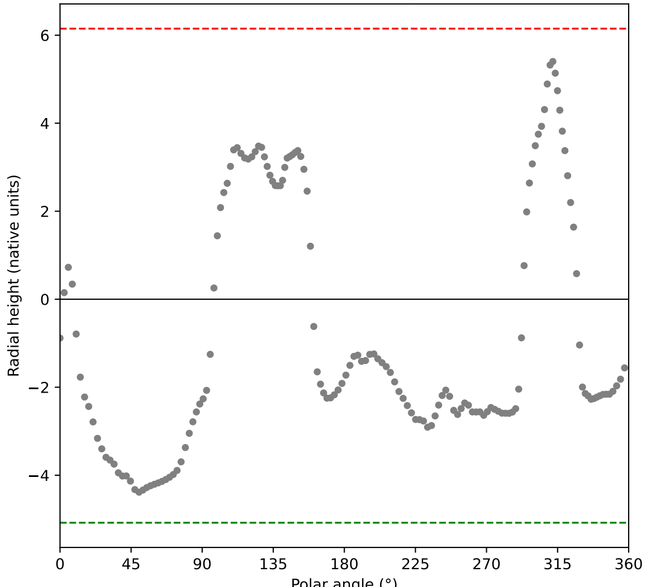

Topographical representation
Protrusions: 0
Intrusions: 0
40
20
0
−20
−40
−40
−20
0
20
40

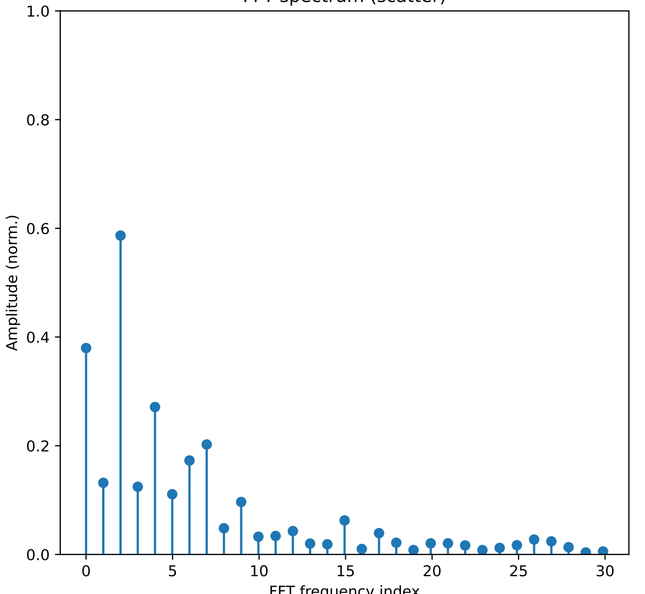

Topographical height
Radial height (native units)
Polar angle (°)
6
4
2
0
−2
−4
0
45
90
135
180
225
270
315
360

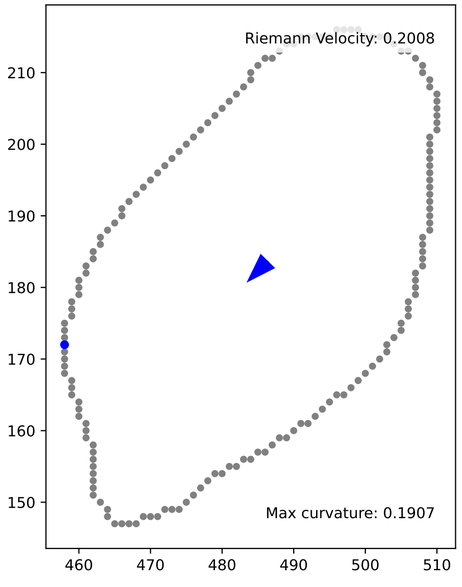

FFT spectrum (scatter)
Amplitude (norm.)
FFT frequency index
1.0
0.8
0.6
0.4
0.2
0.0
0
5
10
15
20
25
30

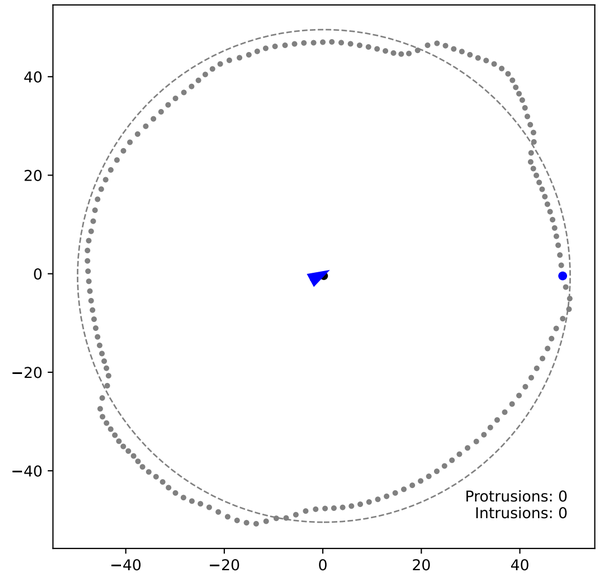

Shape evolution (t = 66.00)
Riemann Velocity: 0.2091
Max curvature: 0.1277

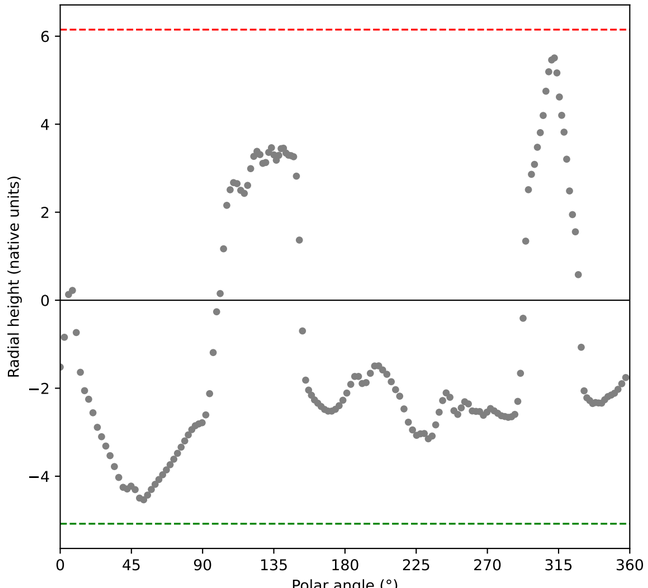

Topographical representation
Protrusions: 0
Intrusions: 0

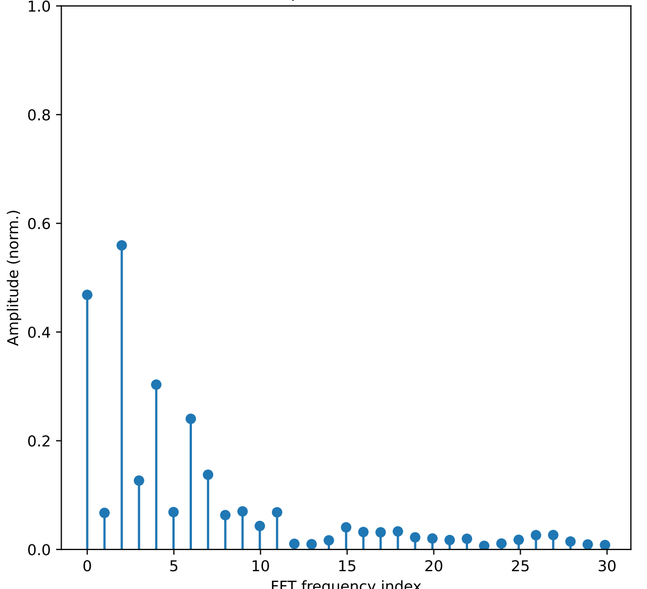

Topographical height
Radial height (native units)
Polar angle (°)

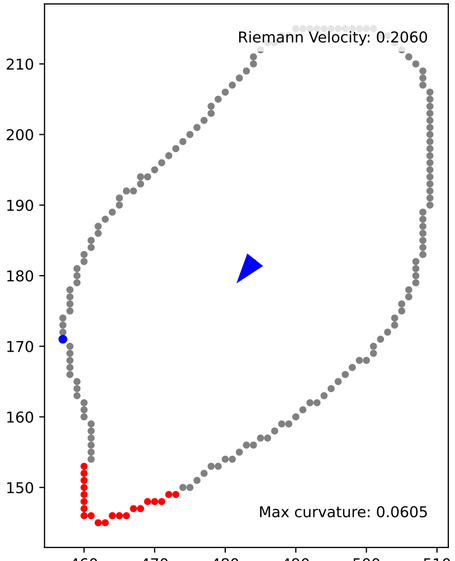

FFT spectrum (scatter)
Amplitude (norm.)
FFT frequency index

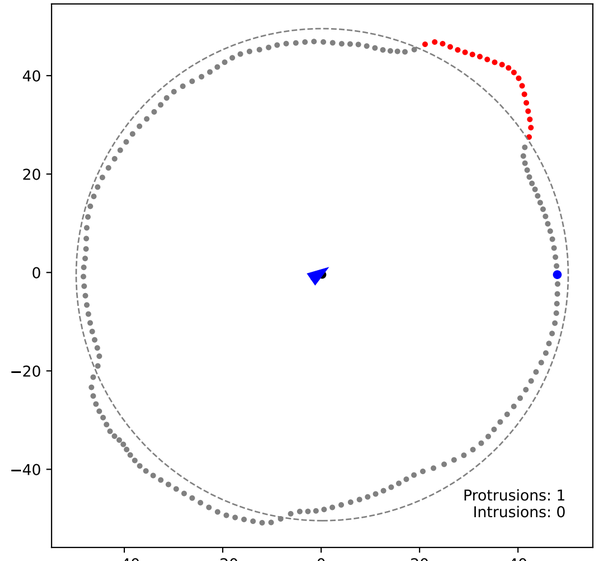

Shape evolution (t = 67.00)
Riemann Velocity: 0.2008
Max curvature: 0.1907
210
200
190
180
170
160
150
460
470
480
490
500
510

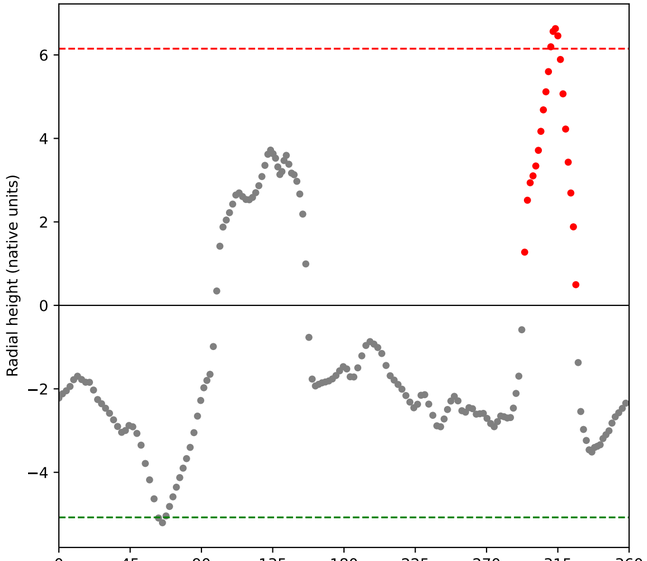

Topographical representation
Protrusions: 0
Intrusions: 0
40
20
0
−20
−40
−40
−20
0
20
40

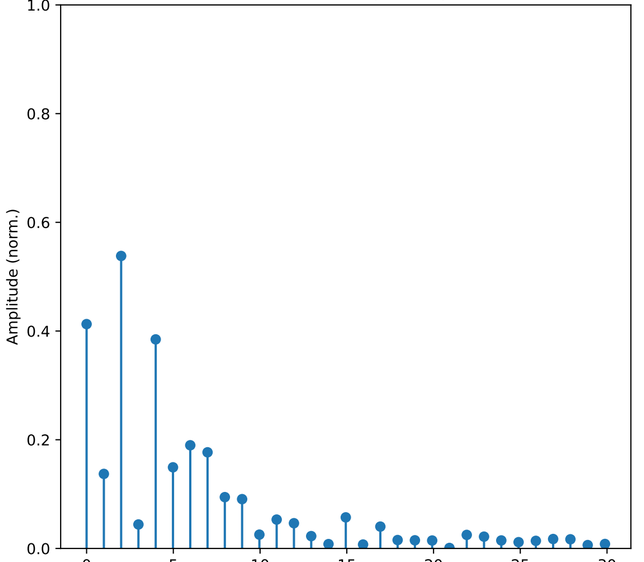

Topographical height
Radial height (native units)
Polar angle (°)
6
4
2
0
−2
−4
0
45
90
135
180
225
270
315
360

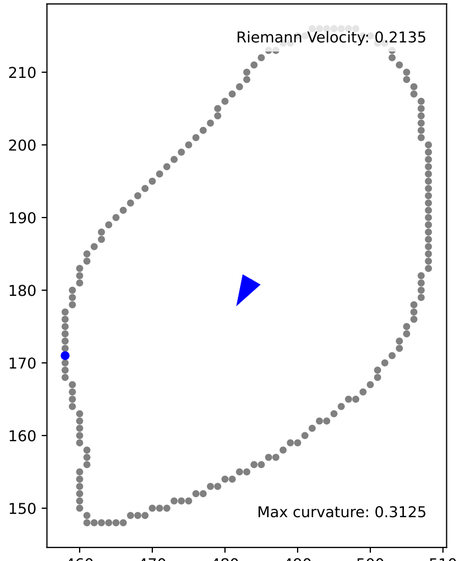

FFT spectrum (scatter)
Amplitude (norm.)
FFT frequency index
1.0
0.8
0.6
0.4
0.2
0.0
0
5
10
15
20
25
30

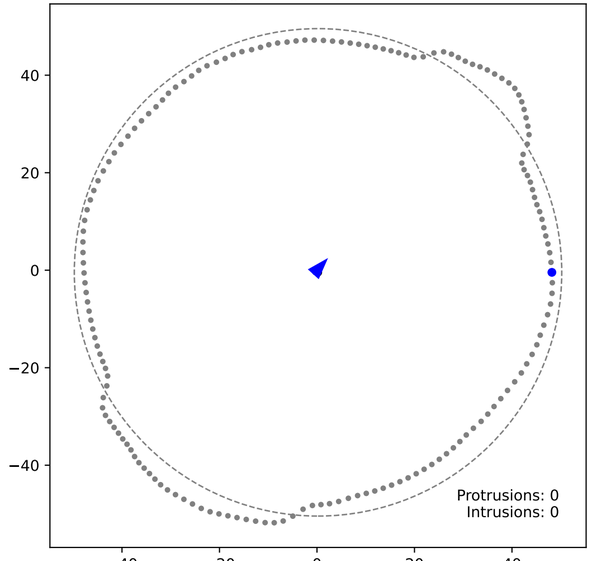

Shape evolution (t = 68.00)
Riemann Velocity: 0.2060
Max curvature: 0.0605
210
200
190
180
170
160
150
460
470
480
490
500
510

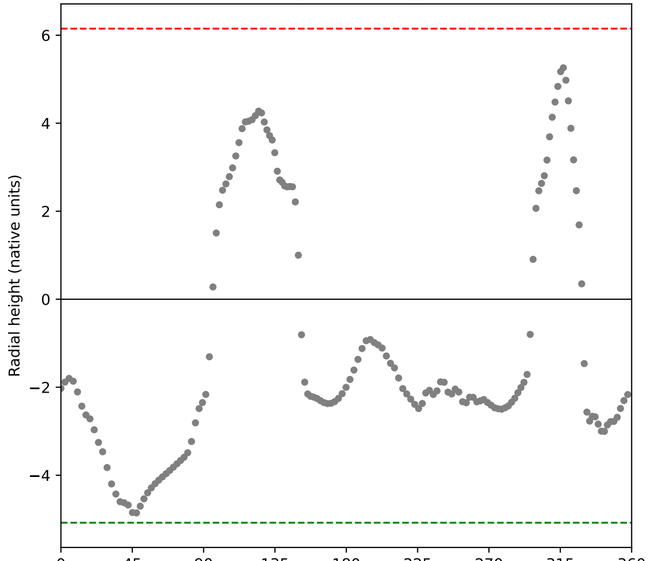

Topographical representation
Protrusions: 1
Intrusions: 0
40
20
0
−20
−40
−40
−20
0
20
40

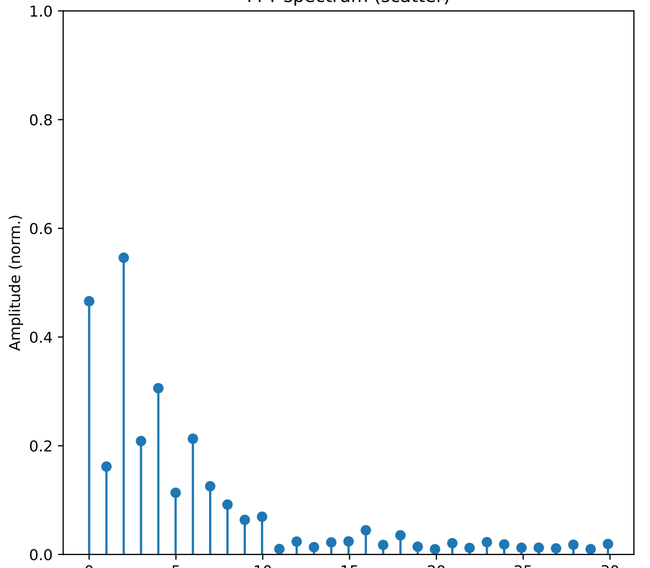

Topographical height
Radial height (native units)
Polar angle (°)
6
4
2
0
−2
−4
0
45
90
135
180
225
270
315
360

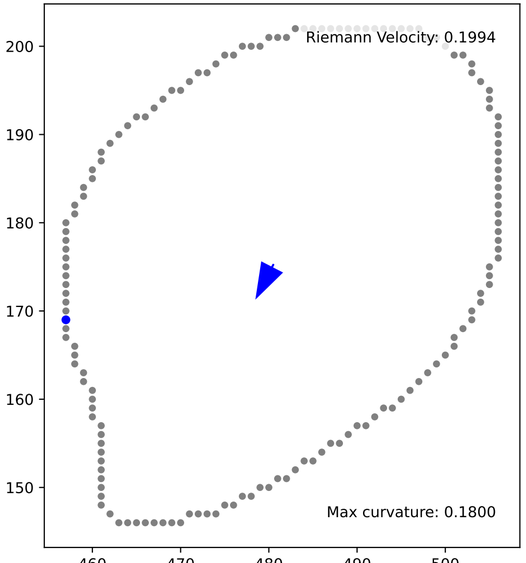

FFT spectrum (scatter)
Amplitude (norm.)
FFT frequency index
1.0
0.8
0.6
0.4
0.2
0.0
0
5
10
15
20
25
30

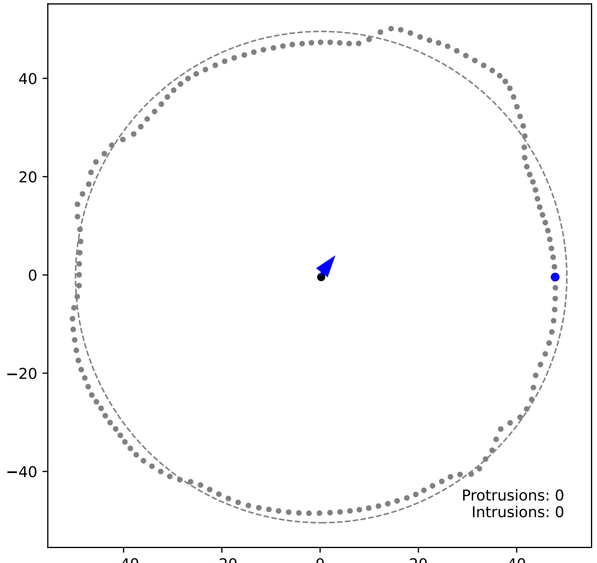

Shape evolution (t = 69.00)
Riemann Velocity: 0.2135
Max curvature: 0.3125

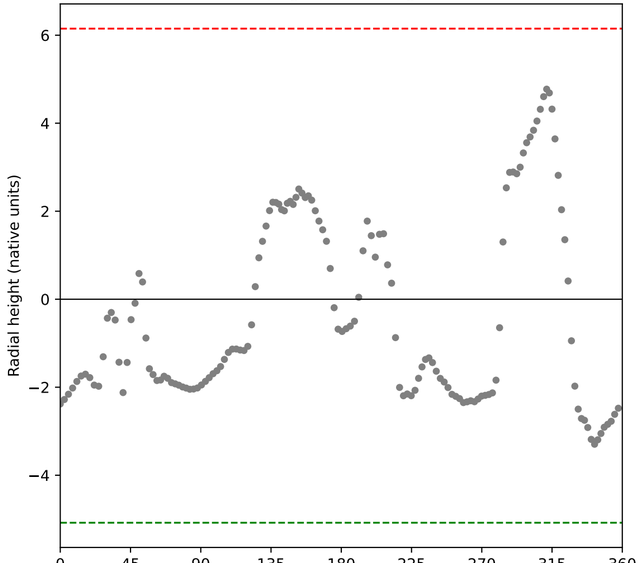

Topographical representation
Protrusions: 0
Intrusions: 0

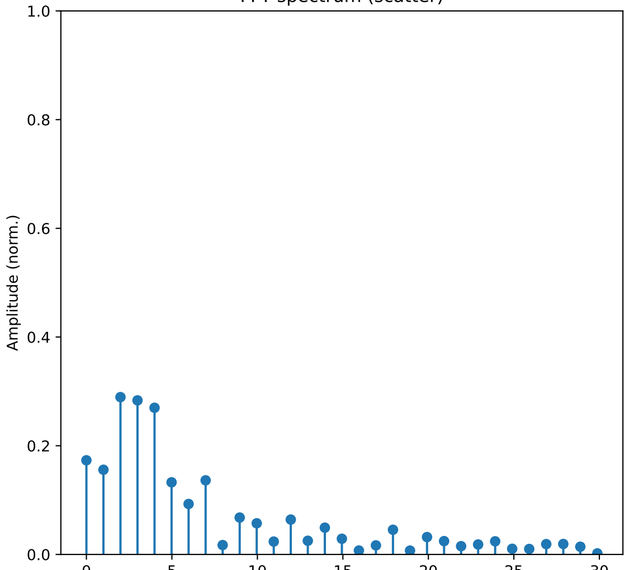

Topographical height
Radial height (native units)
Polar angle (°)

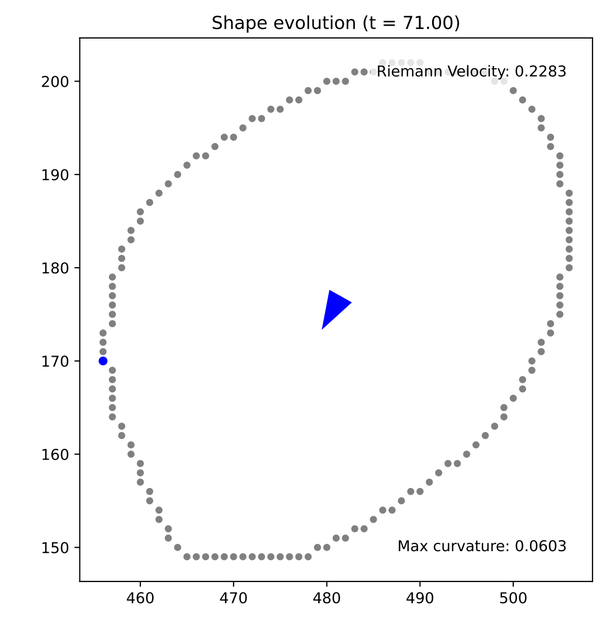

FFT spectrum (scatter)
Amplitude (norm.)
FFT frequency index

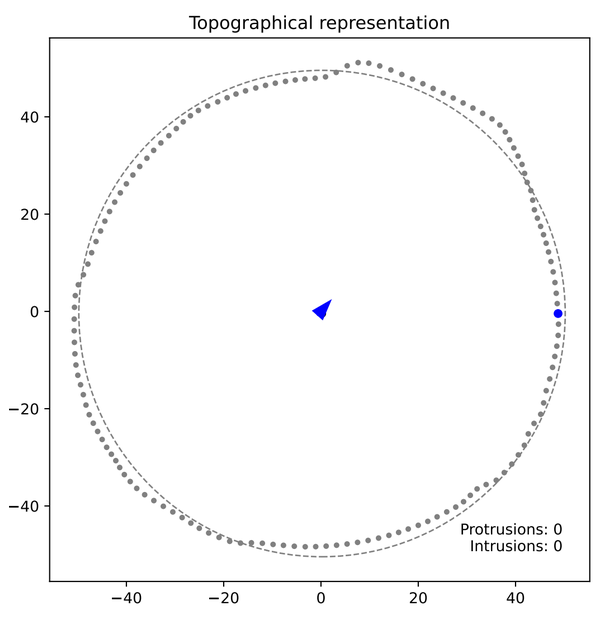

Shape evolution (t = 70.00)
Riemann Velocity: 0.1994
Max curvature: 0.1800
200
190
180
170
160
150
460
470
480
490
500

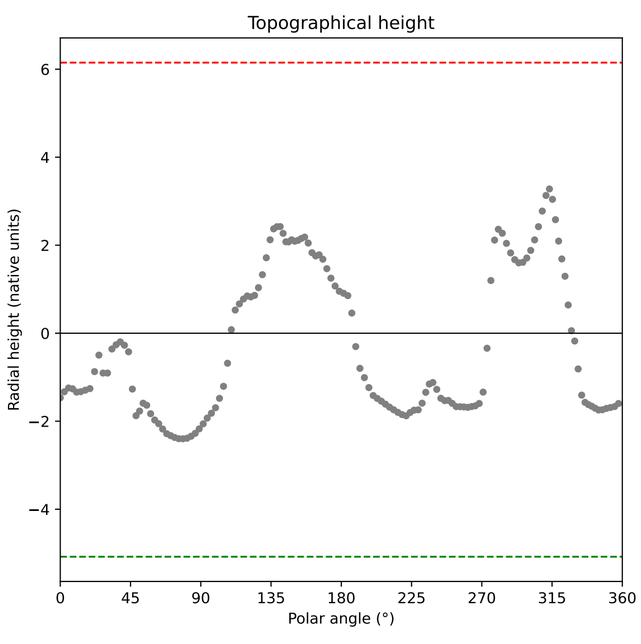

Topographical representation
Protrusions: 0
Intrusions: 0
40
20
0
−20
−40
−40
−20
0
20
40

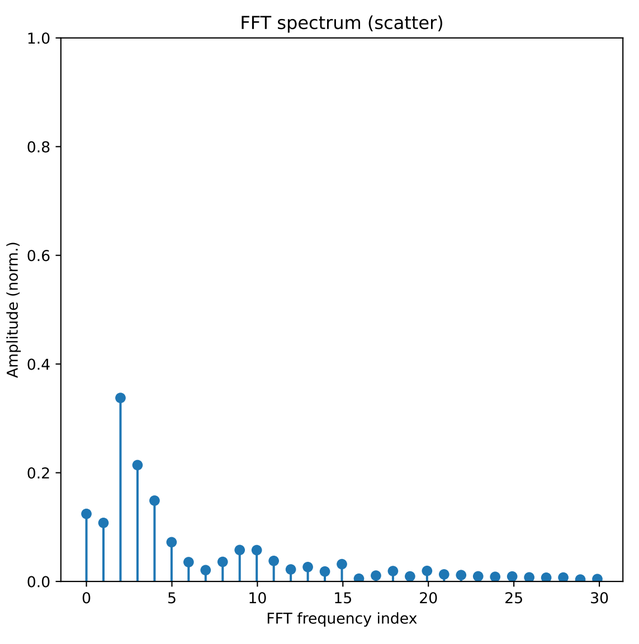

Topographical height
Radial height (native units)
Polar angle (°)
6
4
2
0
−2
−4
0
45
90
135
180
225
270
315
360

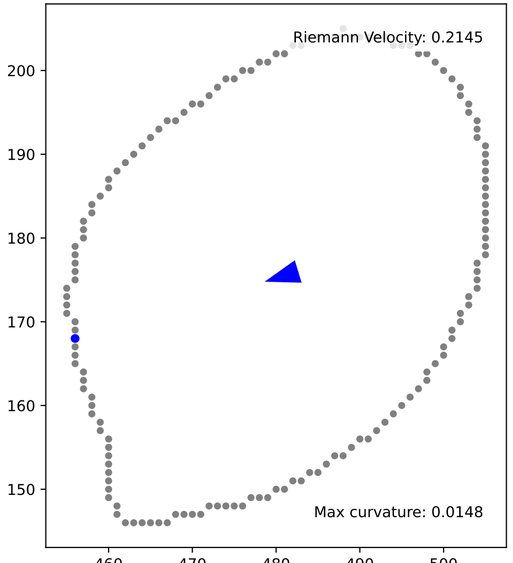

FFT spectrum (scatter)
Amplitude (norm.)
FFT frequency index
1.0
0.8
0.6
0.4
0.2
0.0
0
5
10
15
20
25
30

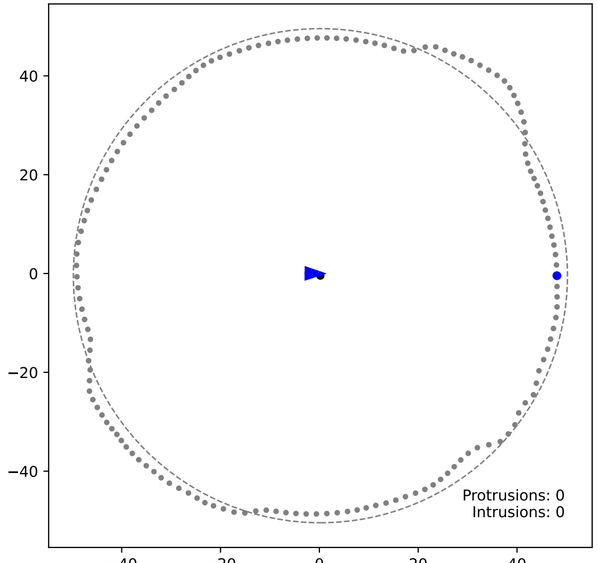

Shape evolution (t = 71.00)
Riemann Velocity: 0.2283
Max curvature: 0.0603
200
190
180
170
160
150
460
470
480
490
500

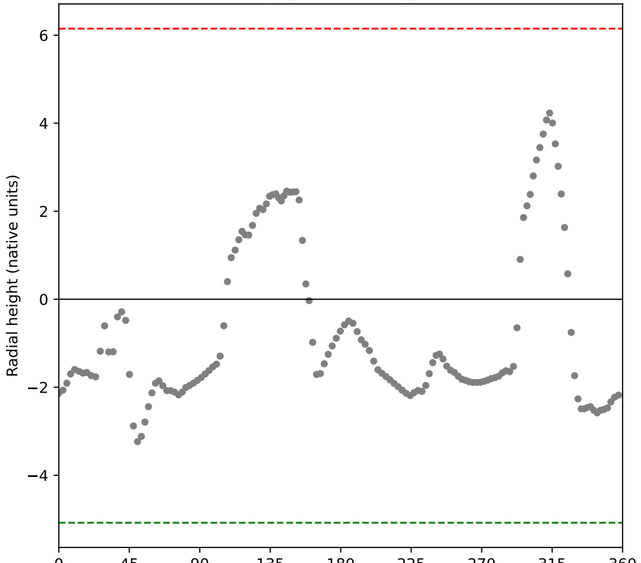

Topographical representation
Protrusions: 0
Intrusions: 0
40
20
0
−20
−40
−40
−20
0
20
40

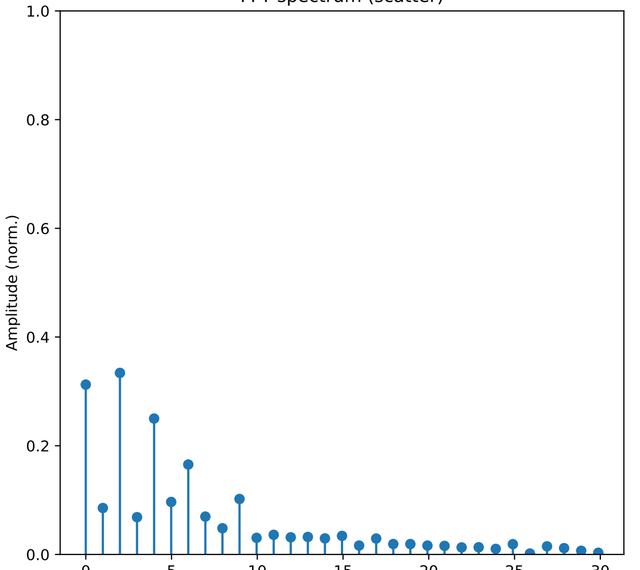

Topographical height
Radial height (native units)
Polar angle (°)
6
4
2
0
−2
−4
0
45
90
135
180
225
270
315
360

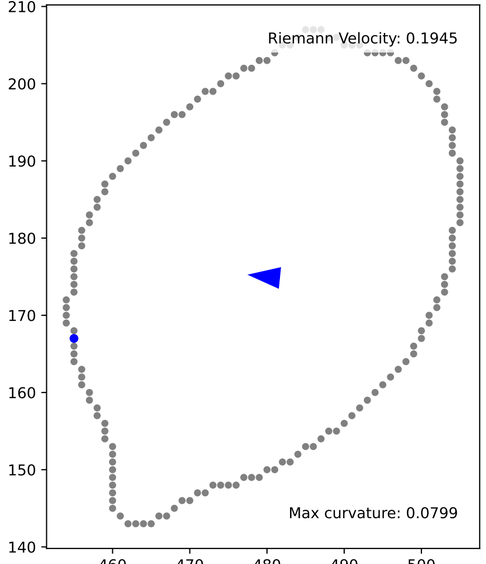

FFT spectrum (scatter)
Amplitude (norm.)
FFT frequency index
1.0
0.8
0.6
0.4
0.2
0.0
0
5
10
15
20
25
30

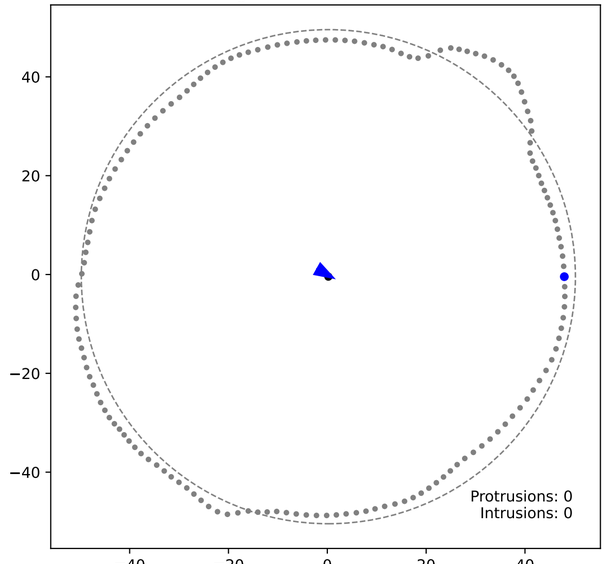

Shape evolution (t = 72.00)
Riemann Velocity: 0.2145
Max curvature: 0.0148
200
190
180
170
160
150
460
470
480
490
500

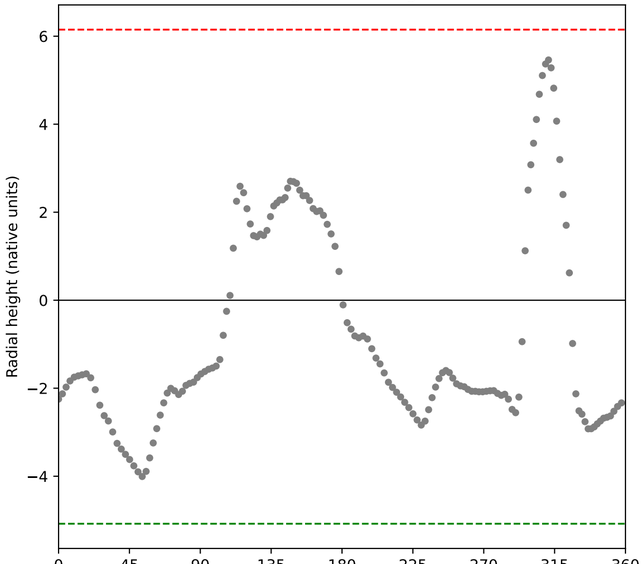

Topographical representation
Protrusions: 0
Intrusions: 0
40
20
0
−20
−40
−40
−20
0
20
40

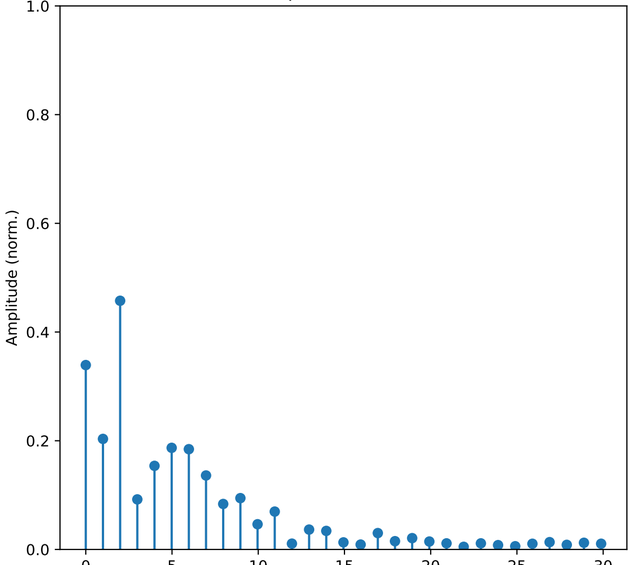

Topographical height
Radial height (native units)
Polar angle (°)
6
4
2
0
−2
−4
0
45
90
135
180
225
270
315
360

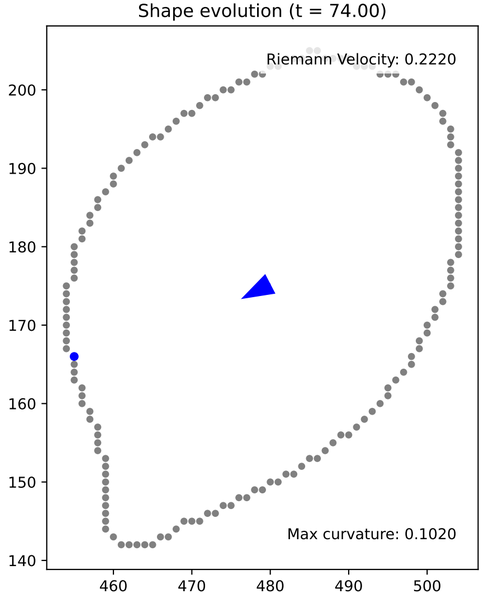

FFT spectrum (scatter)
Amplitude (norm.)
FFT frequency index
1.0
0.8
0.6
0.4
0.2
0.0
0
5
10
15
20
25
30

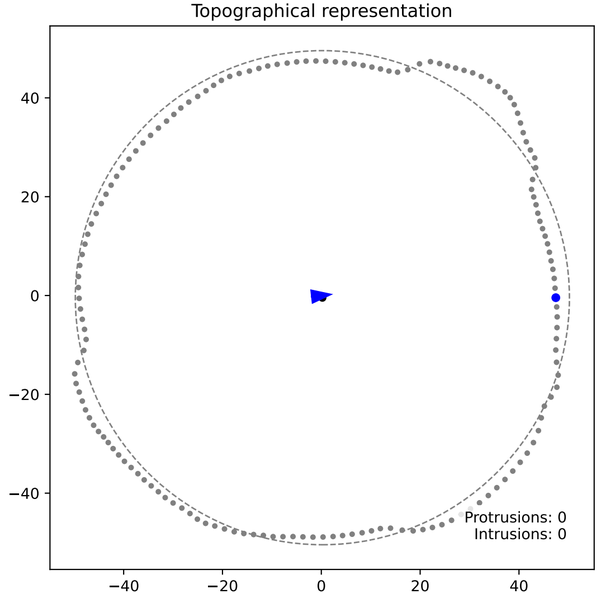

Shape evolution (t = 73.00)
Riemann Velocity: 0.1945
Max curvature: 0.0799

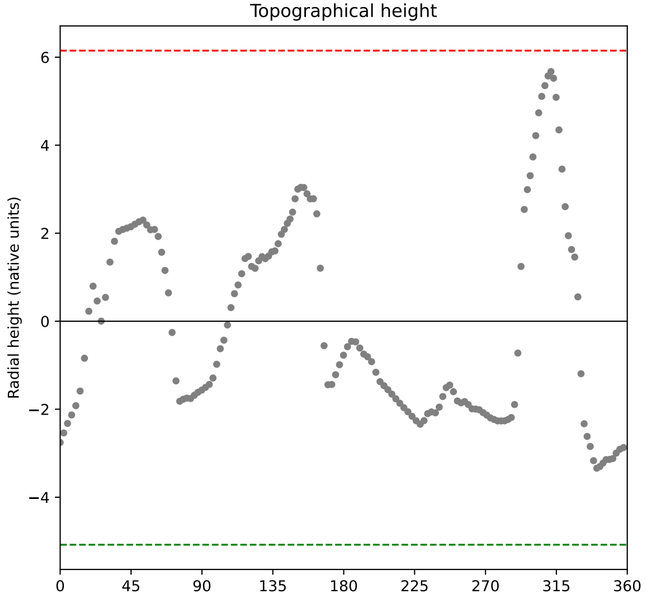

Topographical representation
Protrusions: 0
Intrusions: 0

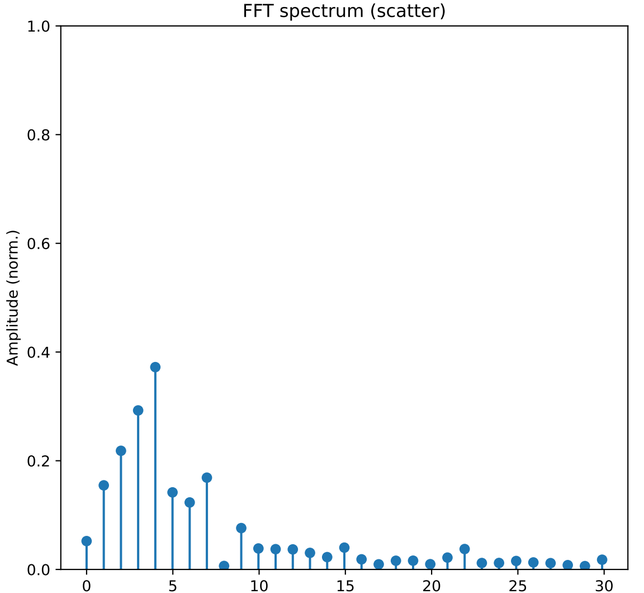

Topographical height
Radial height (native units)
Polar angle (°)

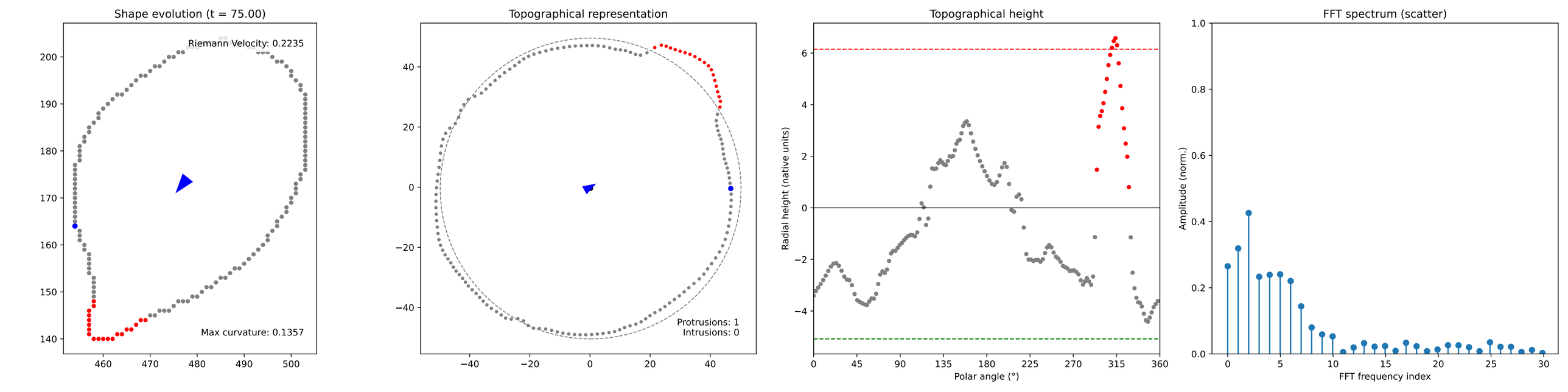

FFT spectrum (scatter)
Amplitude (norm.)
FFT frequency index

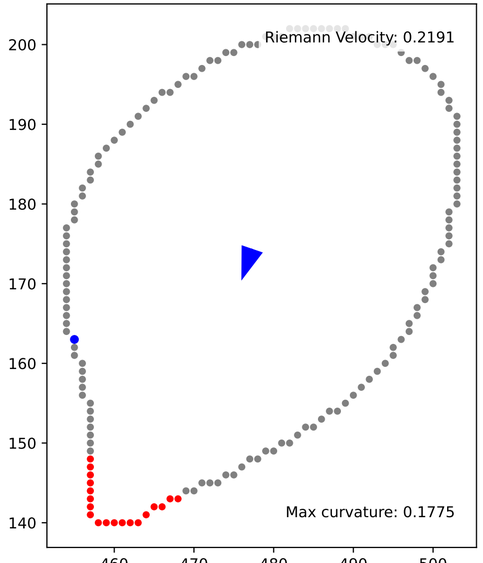

Shape evolution (t = 74.00)
Riemann Velocity: 0.2220
Max curvature: 0.1020
200
190
180
170
160
150
140
460
470
480
490
500

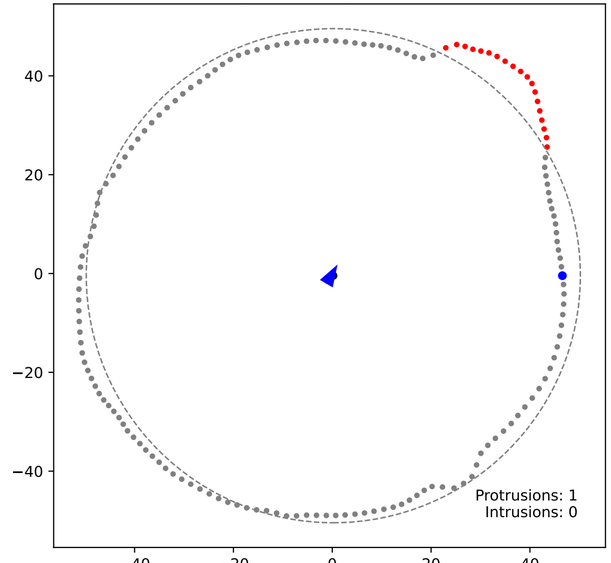

Topographical representation
Protrusions: 0
Intrusions: 0
40
20
0
−20
−40
−40
−20
0
20
40

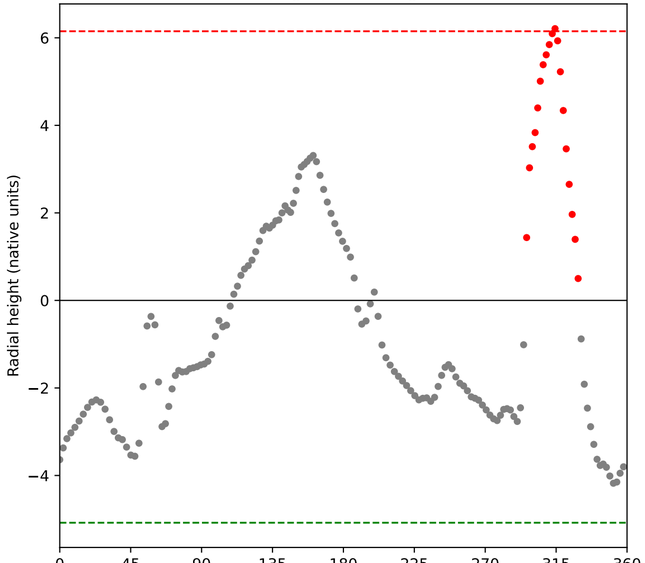

Topographical height
Radial height (native units)
Polar angle (°)
6
4
2
0
−2
−4
0
45
90
135
180
225
270
315
360

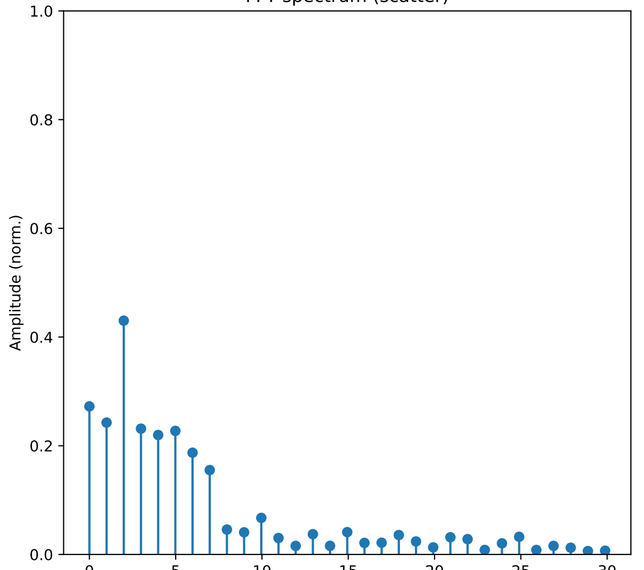

FFT spectrum (scatter)
Amplitude (norm.)
FFT frequency index
1.0
0.8
0.6
0.4
0.2
0.0
0
5
10
15
20
25
30

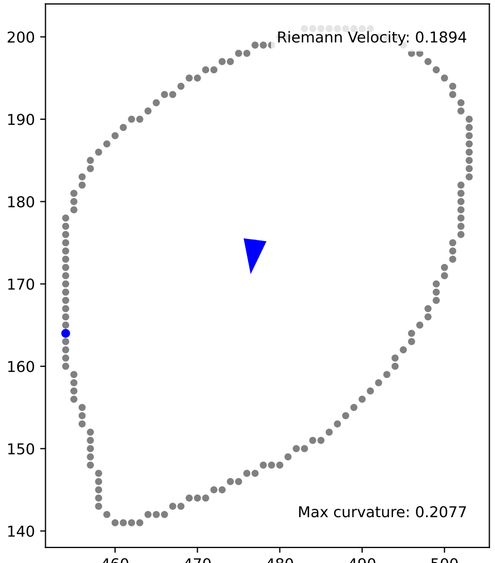

Shape evolution (t = 75.00)
Riemann Velocity: 0.2235
Max curvature: 0.1357
Topographical representation
Protrusions: 1
Intrusions: 0
Topographical height
Radial height (native units)
Polar angle (°)
FFT spectrum (scatter)
Amplitude (norm.)
FFT frequency index

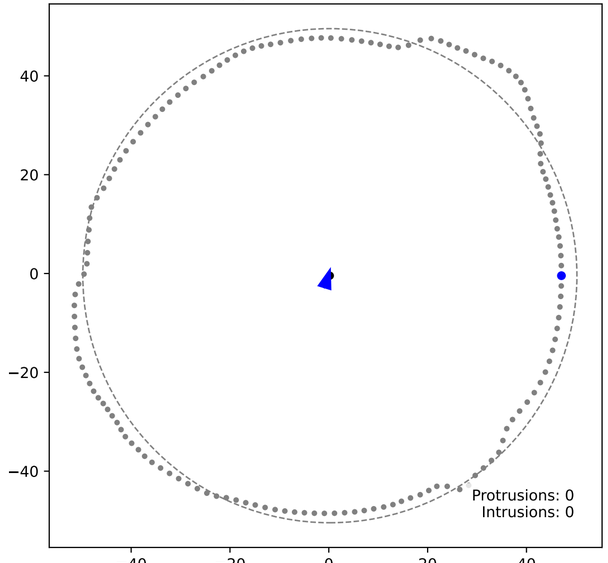

Shape evolution (t = 76.00)
Riemann Velocity: 0.2191
Max curvature: 0.1775
200
190
180
170
160
150
140
460
470
480
490
500

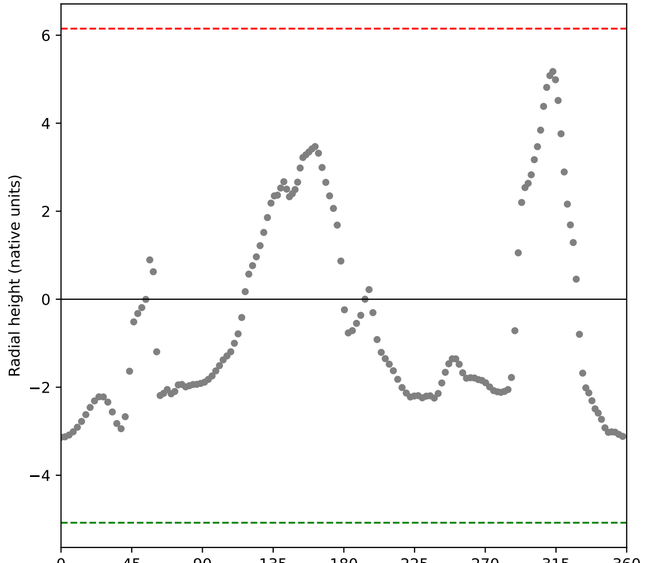

Topographical representation
Protrusions: 1
Intrusions: 0
40
20
0
−20
−40
−40
−20
0
20
40

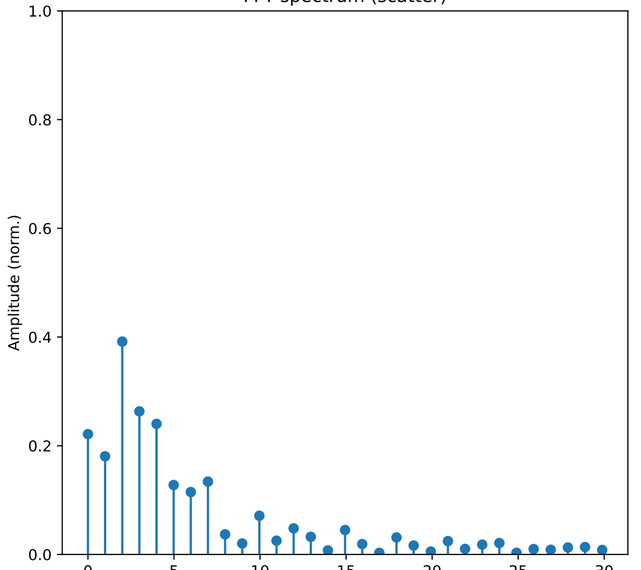

Topographical height
Radial height (native units)
Polar angle (°)
6
4
2
0
−2
−4
0
45
90
135
180
225
270
315
360

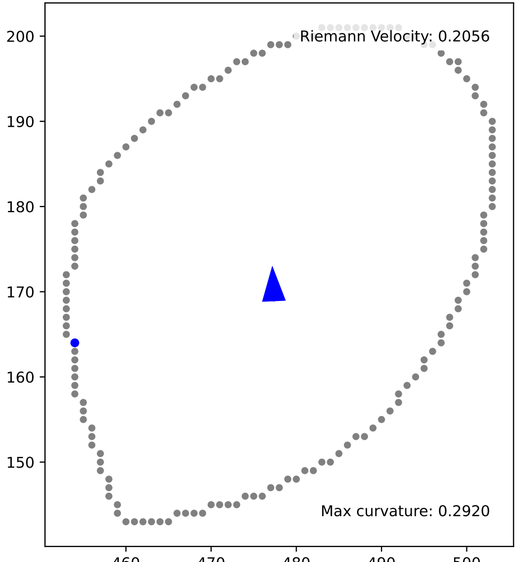

FFT spectrum (scatter)
Amplitude (norm.)
FFT frequency index
1.0
0.8
0.6
0.4
0.2
0.0
0
5
10
15
20
25
30

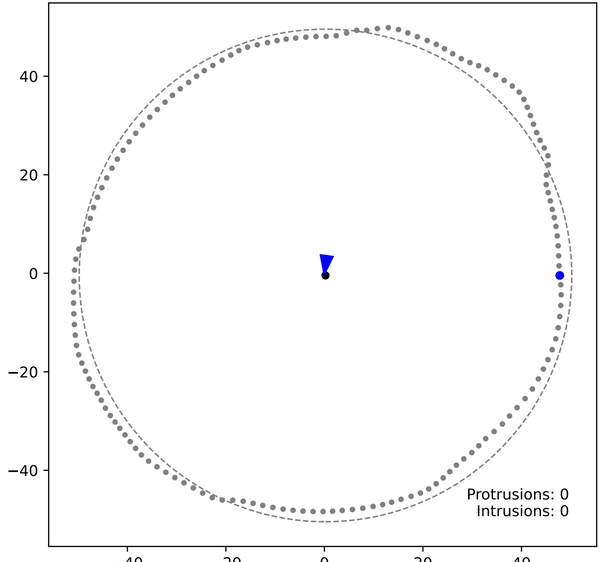

Shape evolution (t = 77.00)
Riemann Velocity: 0.1894
Max curvature: 0.2077
200
190
180
170
160
150
140
460
470
480
490
500

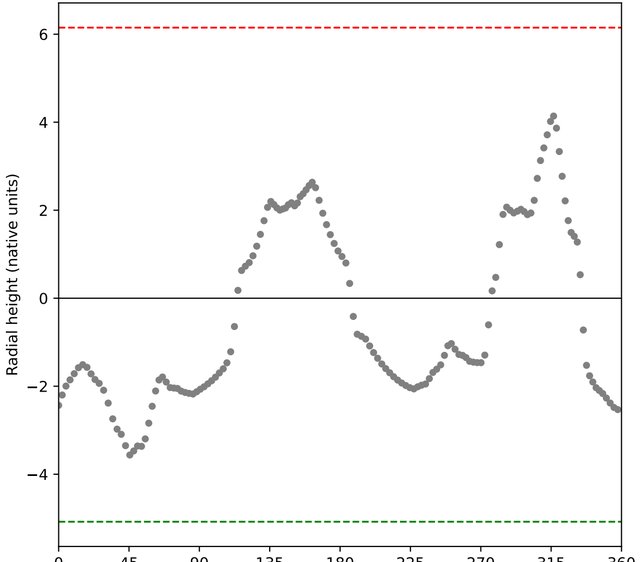

Topographical representation
Protrusions: 0
Intrusions: 0
40
20
0
−20
−40
−40
−20
0
20
40

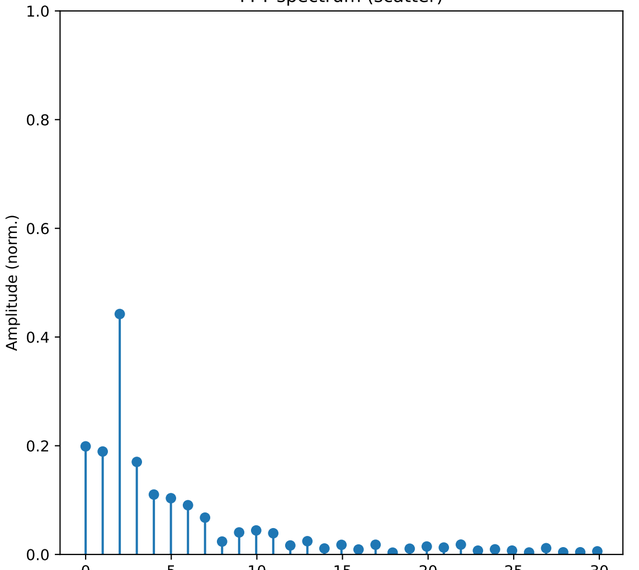

Topographical height
Radial height (native units)
Polar angle (°)
6
4
2
0
−2
−4
0
45
90
135
180
225
270
315
360

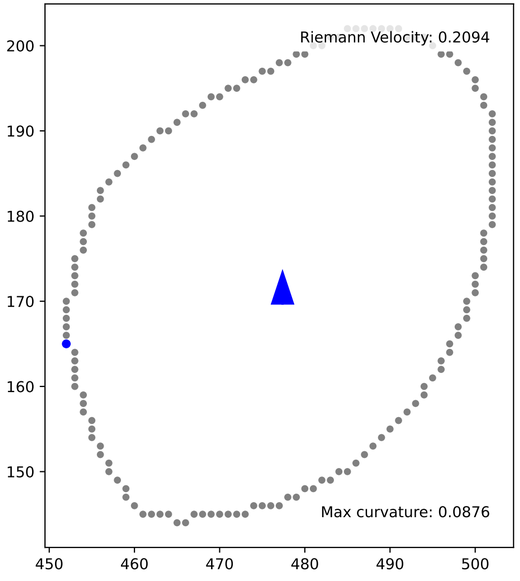

FFT spectrum (scatter)
Amplitude (norm.)
FFT frequency index
1.0
0.8
0.6
0.4
0.2
0.0
0
5
10
15
20
25
30

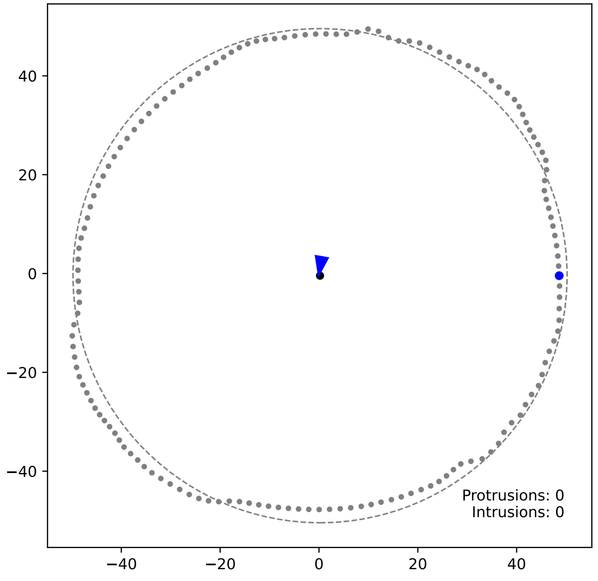

Shape evolution (t = 78.00)
Riemann Velocity: 0.2056
Max curvature: 0.2920
200
190
180
170
160
150
460
470
480
490
500

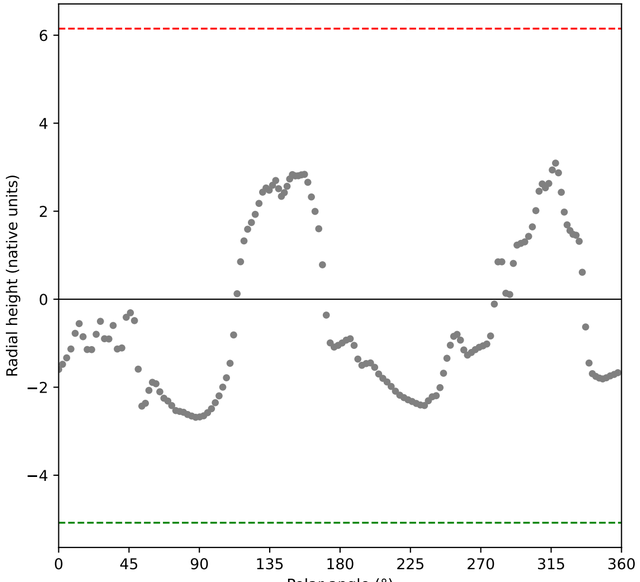

Topographical representation
Protrusions: 0
Intrusions: 0
40
20
0
−20
−40
−40
−20
0
20
40

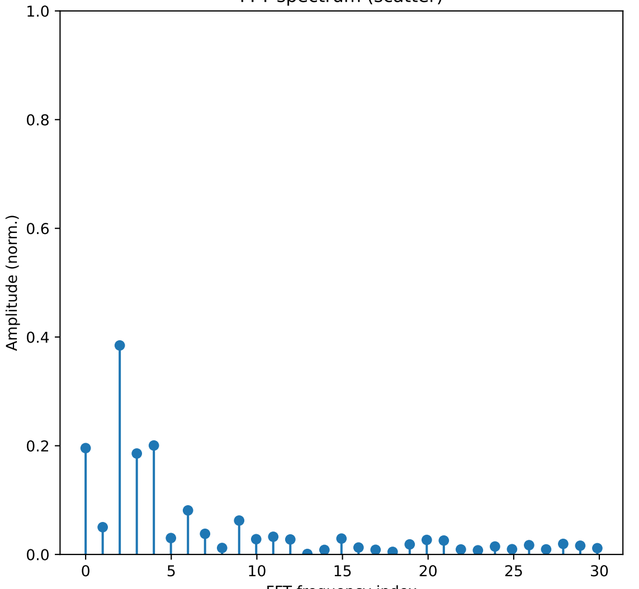

Topographical height
Radial height (native units)
Polar angle (°)
6
4
2
0
−2
−4
0
45
90
135
180
225
270
315
360

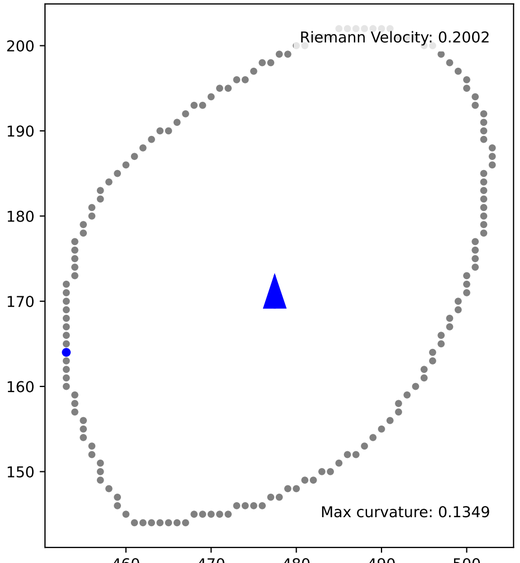

FFT spectrum (scatter)
Amplitude (norm.)
FFT frequency index
1.0
0.8
0.6
0.4
0.2
0.0
0
5
10
15
20
25
30

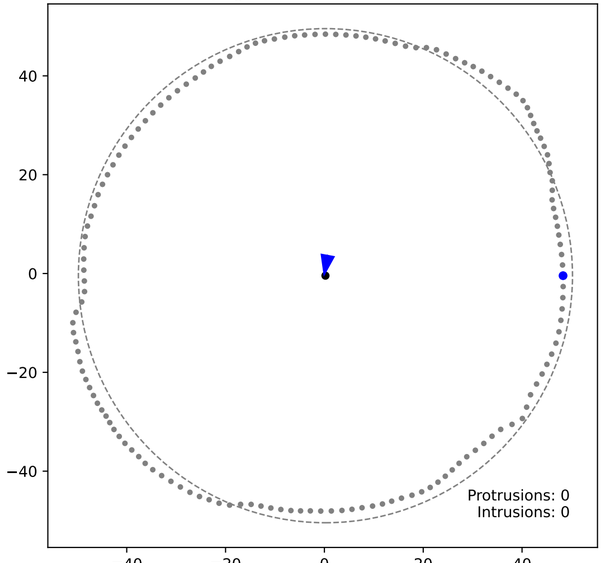

Shape evolution (t = 79.00)
Riemann Velocity: 0.2094
Max curvature: 0.0876
200
190
180
170
160
150
450
460
470
480
490
500

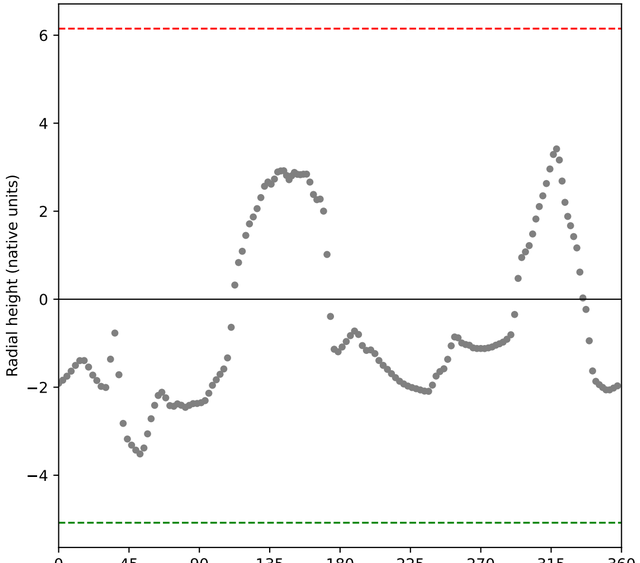

Topographical representation
Protrusions: 0
Intrusions: 0
40
20
0
−20
−40
−40
−20
0
20
40

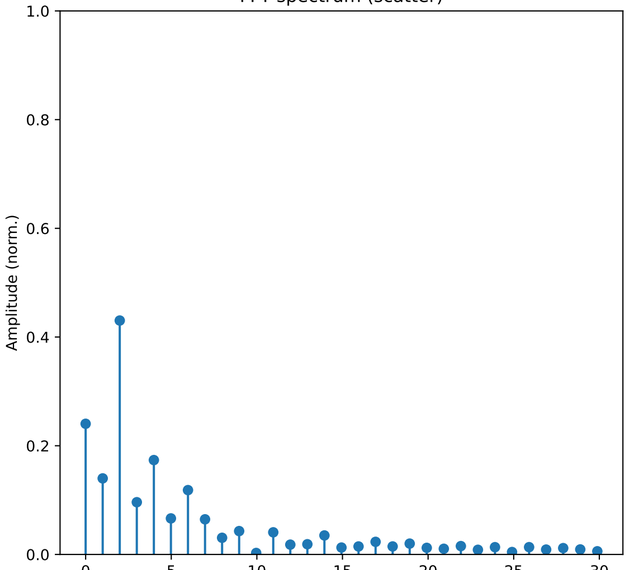

Topographical height
Radial height (native units)
Polar angle (°)
6
4
2
0
−2
−4
0
45
90
135
180
225
270
315
360

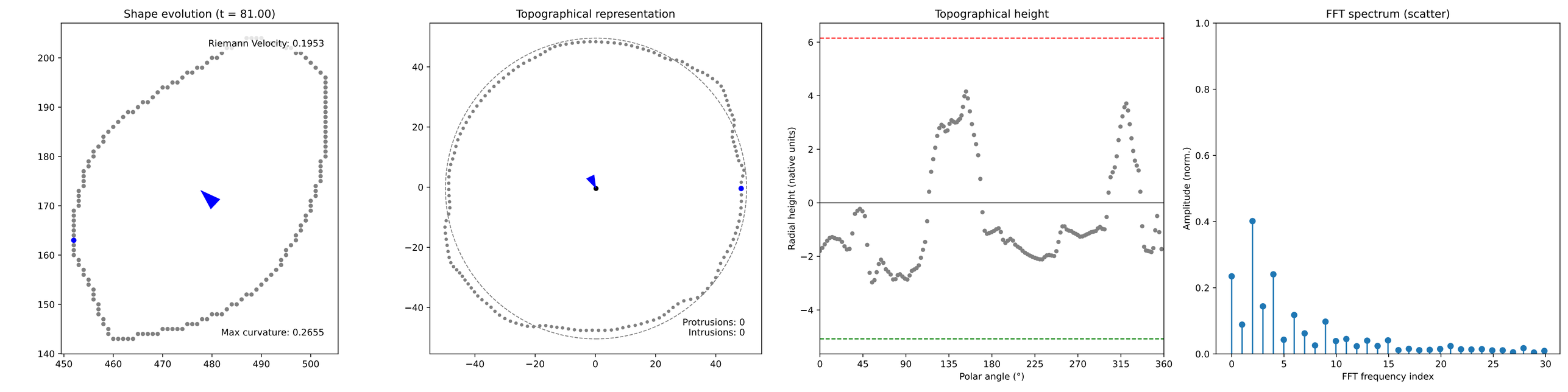

FFT spectrum (scatter)
Amplitude (norm.)
FFT frequency index
1.0
0.8
0.6
0.4
0.2
0.0
0
5
10
15
20
25
30

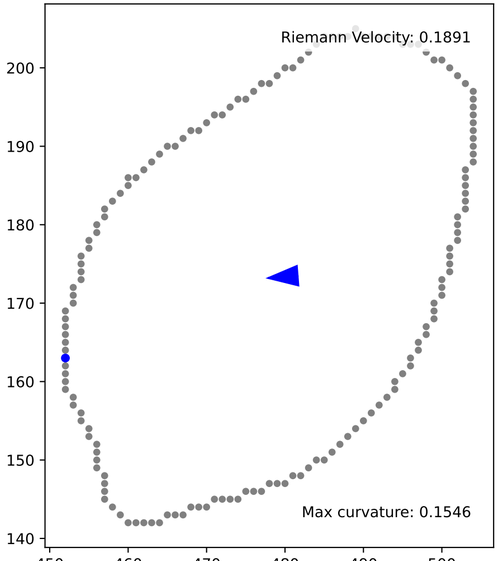

Shape evolution (t = 80.00)
Riemann Velocity: 0.2002
Max curvature: 0.1349
200
190
180
170
160
150
460
470
480
490
500

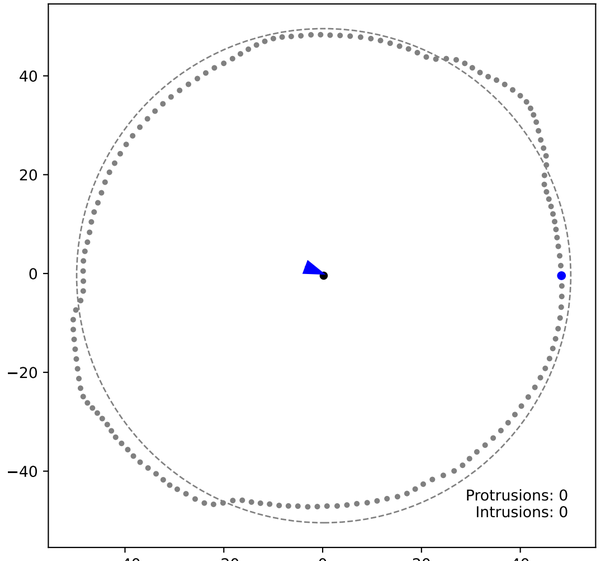

Topographical representation
Protrusions: 0
Intrusions: 0
40
20
0
−20
−40
−40
−20
0
20
40

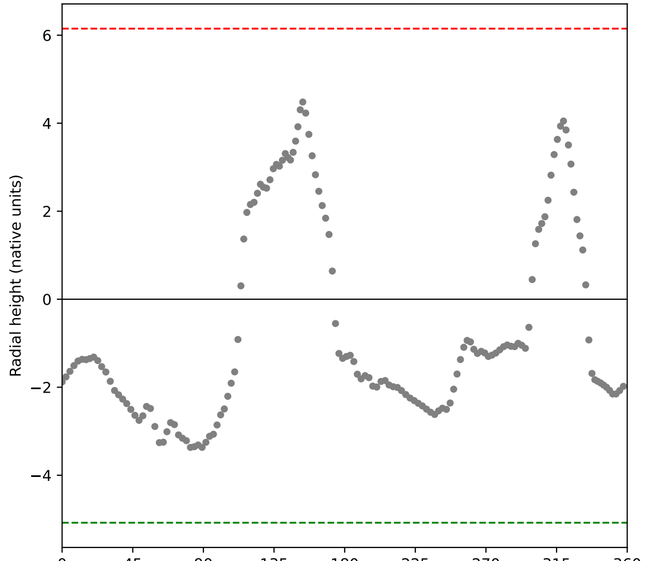

Topographical height
Radial height (native units)
Polar angle (°)
6
4
2
0
−2
−4
0
45
90
135
180
225
270
315
360

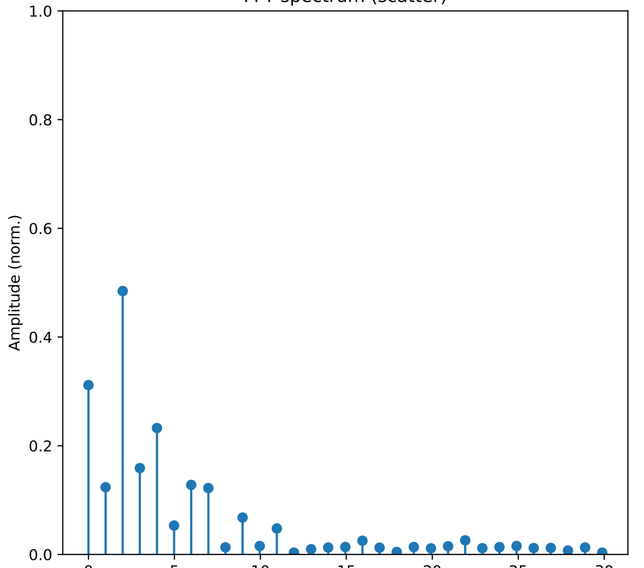

FFT spectrum (scatter)
Amplitude (norm.)
FFT frequency index
1.0
0.8
0.6
0.4
0.2
0.0
0
5
10
15
20
25
30

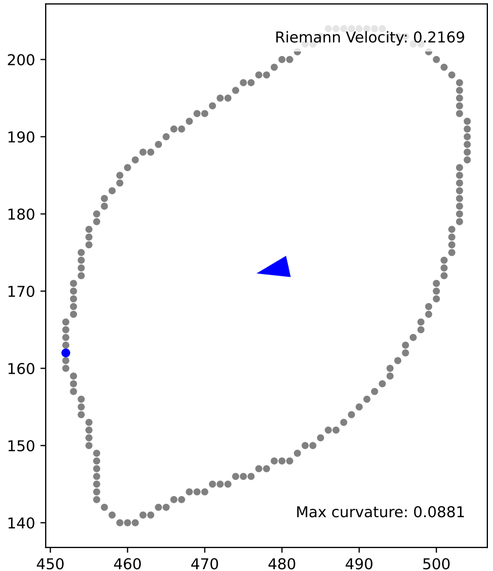

Shape evolution (t = 81.00)
Riemann Velocity: 0.1953
Max curvature: 0.2655
Topographical representation
Protrusions: 0
Intrusions: 0
Topographical height
Radial height (native units)
Polar angle (°)
FFT spectrum (scatter)
Amplitude (norm.)
FFT frequency index

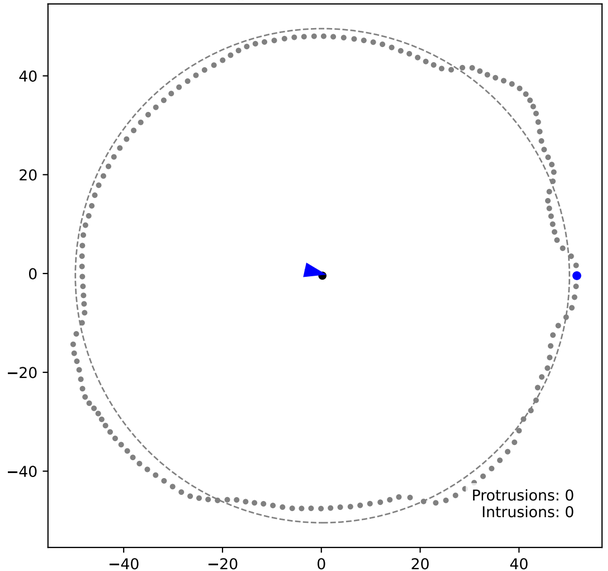

Shape evolution (t = 82.00)
Riemann Velocity: 0.1891
Max curvature: 0.1546
200
190
180
170
160
150
140
450
460
470
480
490
500

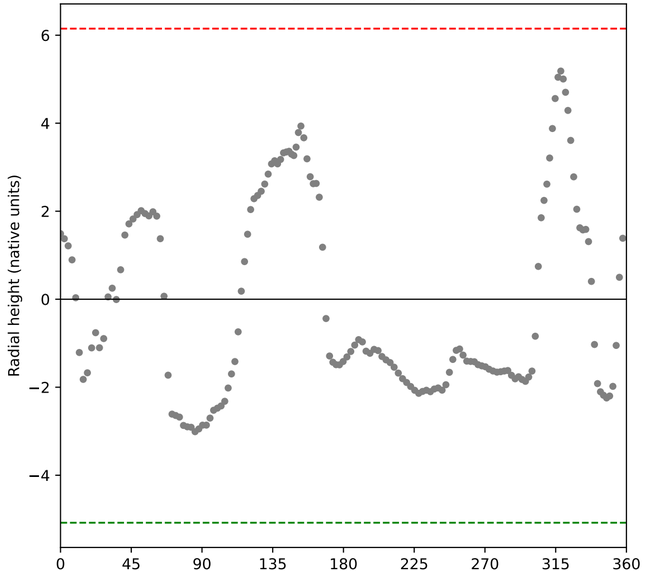

Topographical representation
Protrusions: 0
Intrusions: 0
40
20
0
−20
−40
−40
−20
0
20
40

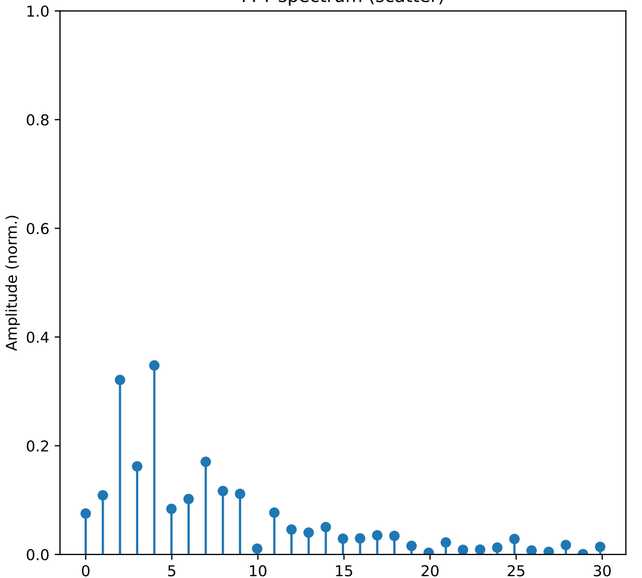

Topographical height
Radial height (native units)
Polar angle (°)
6
4
2
0
−2
−4
0
45
90
135
180
225
270
315
360

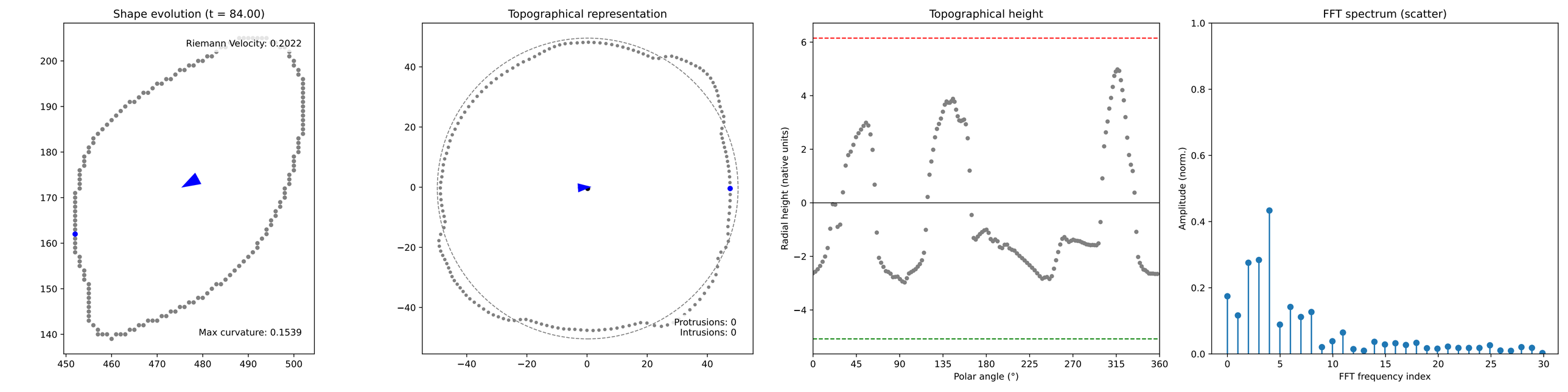

FFT spectrum (scatter)
Amplitude (norm.)
FFT frequency index
1.0
0.8
0.6
0.4
0.2
0.0
0
5
10
15
20
25
30

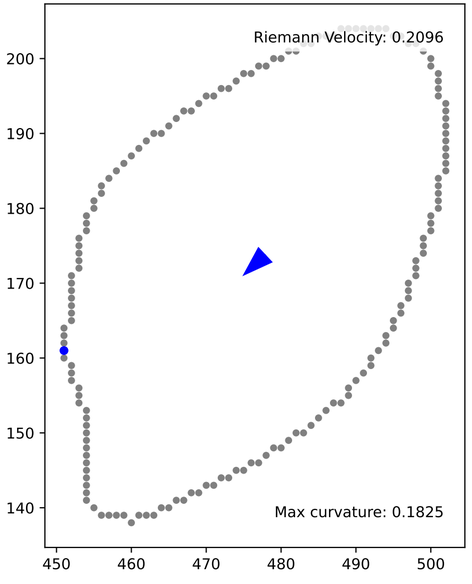

Shape evolution (t = 83.00)
Riemann Velocity: 0.2169
Max curvature: 0.0881
200
190
180
170
160
150
140
450
460
470
480
490
500

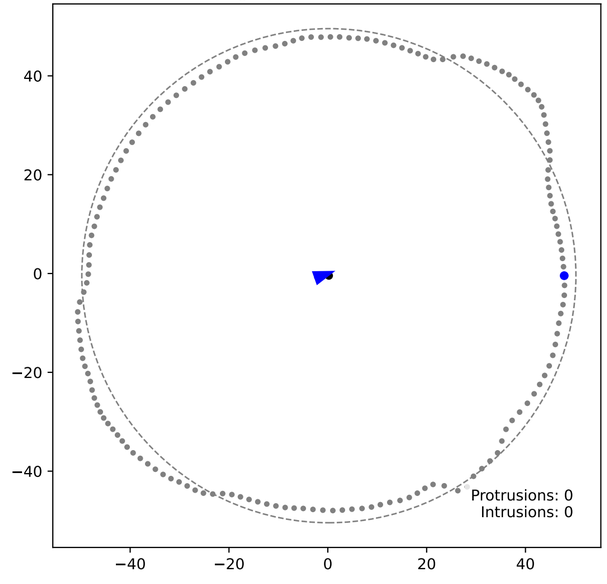

Topographical representation
Protrusions: 0
Intrusions: 0
40
20
0
−20
−40
−40
−20
0
20
40

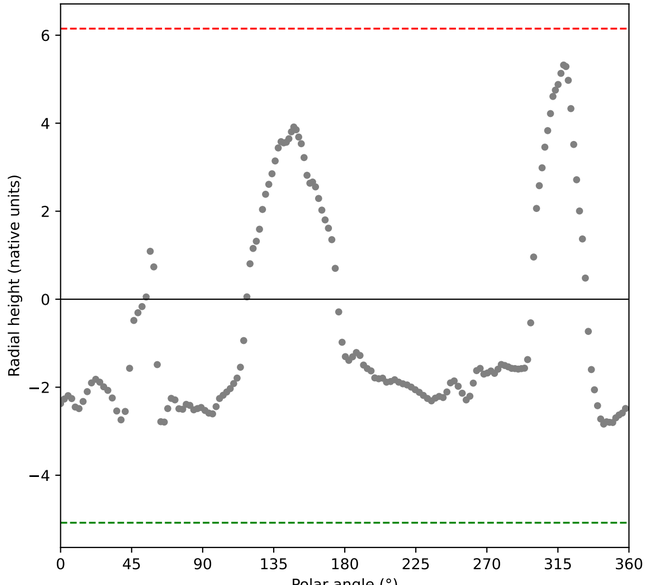

Topographical height
Radial height (native units)
Polar angle (°)
6
4
2
0
−2
−4
0
45
90
135
180
225
270
315
360

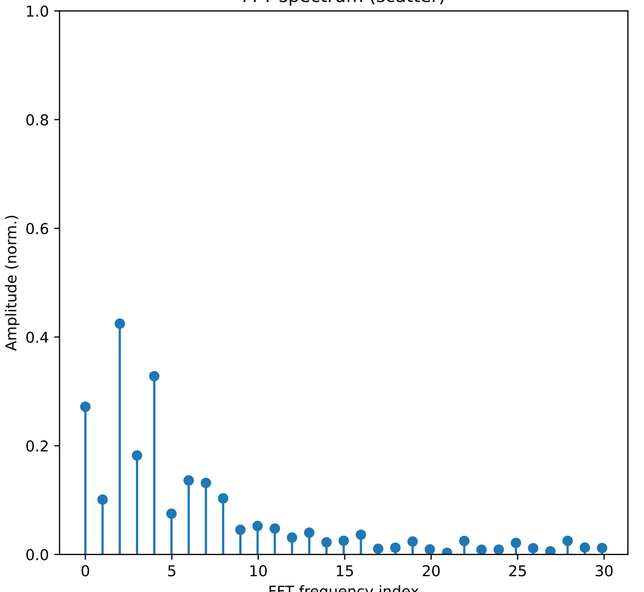

FFT spectrum (scatter)
Amplitude (norm.)
FFT frequency index
1.0
0.8
0.6
0.4
0.2
0.0
0
5
10
15
20
25
30

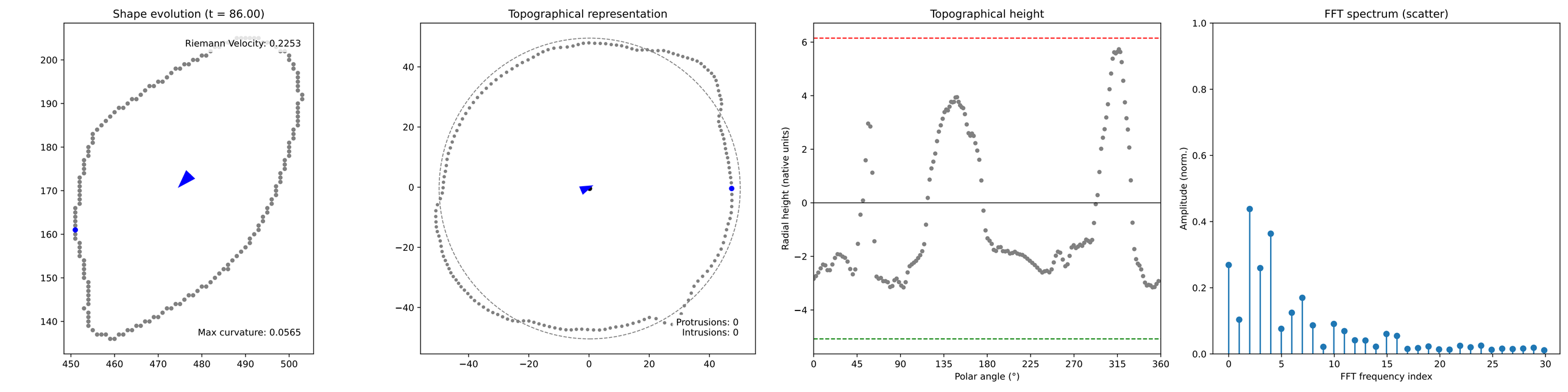

Shape evolution (t = 84.00)
Riemann Velocity: 0.2022
Max curvature: 0.1539
Topographical representation
Protrusions: 0
Intrusions: 0
Topographical height
Radial height (native units)
Polar angle (°)
FFT spectrum (scatter)
Amplitude (norm.)
FFT frequency index

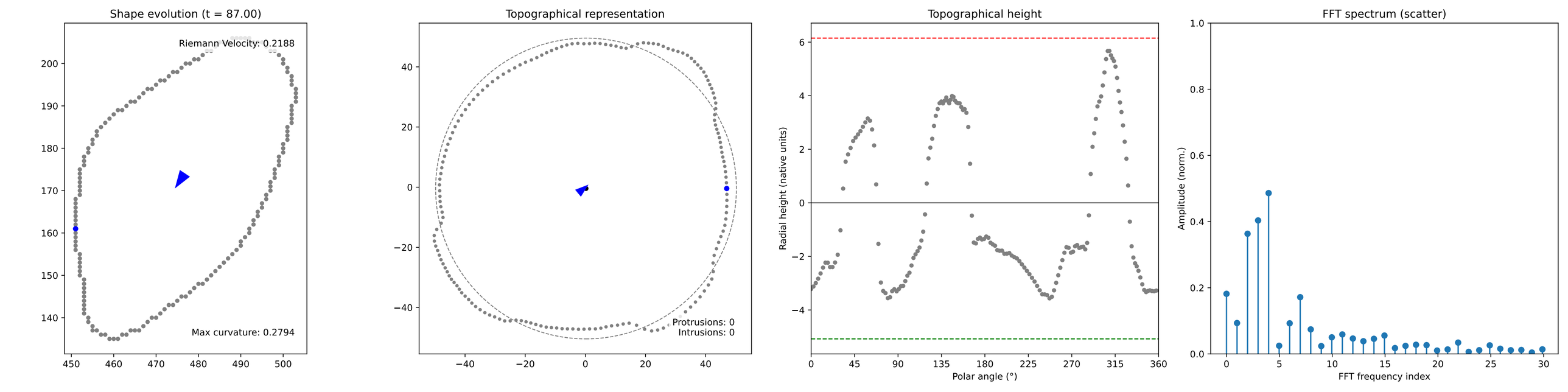

Shape evolution (t = 85.00)
Riemann Velocity: 0.2096
Max curvature: 0.1825
200
190
180
170
160
150
140
450
460
470
480
490
500

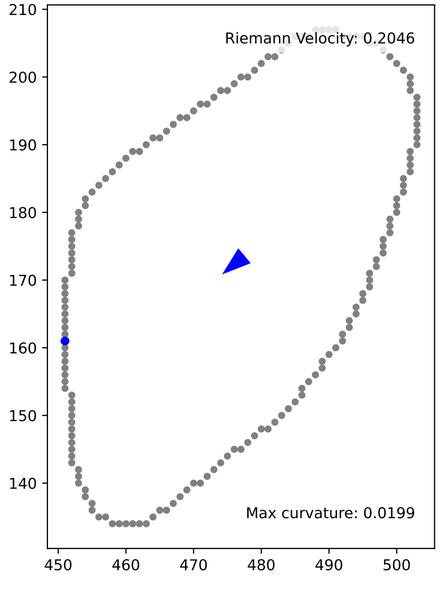

Topographical representation
Protrusions: 0
Intrusions: 0
40
20
0
−20
−40
−40
−20
0
20
40

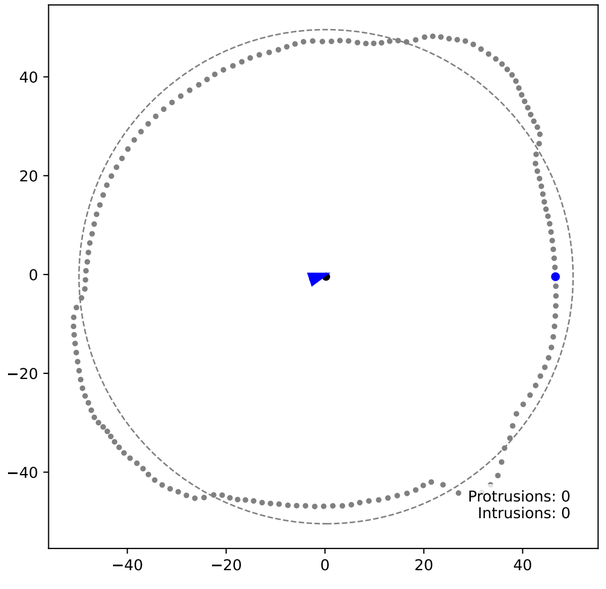

Topographical height
Radial height (native units)
Polar angle (°)
6
4
2
0
−2
−4
0
45
90
135
180
225
270
315
360

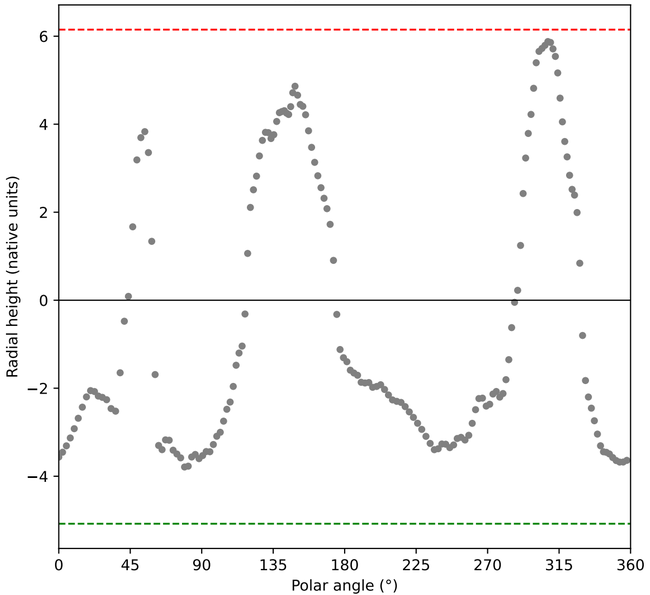

FFT spectrum (scatter)
Amplitude (norm.)
FFT frequency index
1.0
0.8
0.6
0.4
0.2
0.0
0
5
10
15
20
25
30

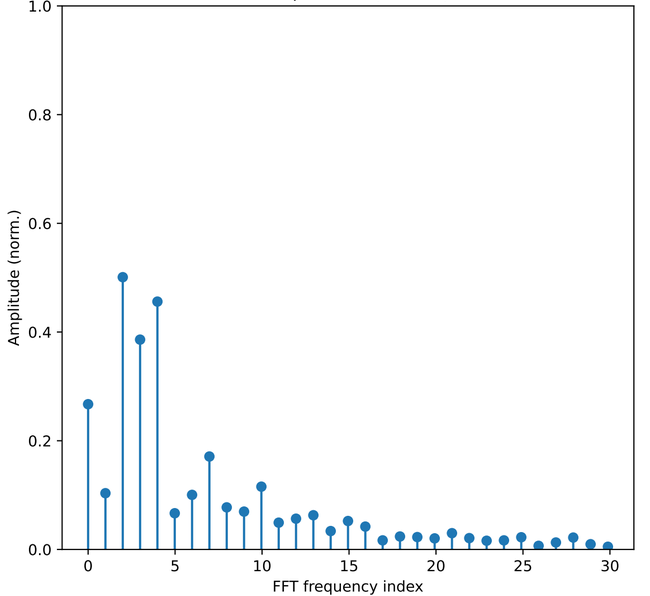

Shape evolution (t = 86.00)
Riemann Velocity: 0.2253
Max curvature: 0.0565
Topographical representation
Protrusions: 0
Intrusions: 0
Topographical height
Radial height (native units)
Polar angle (°)
FFT spectrum (scatter)
Amplitude (norm.)
FFT frequency index

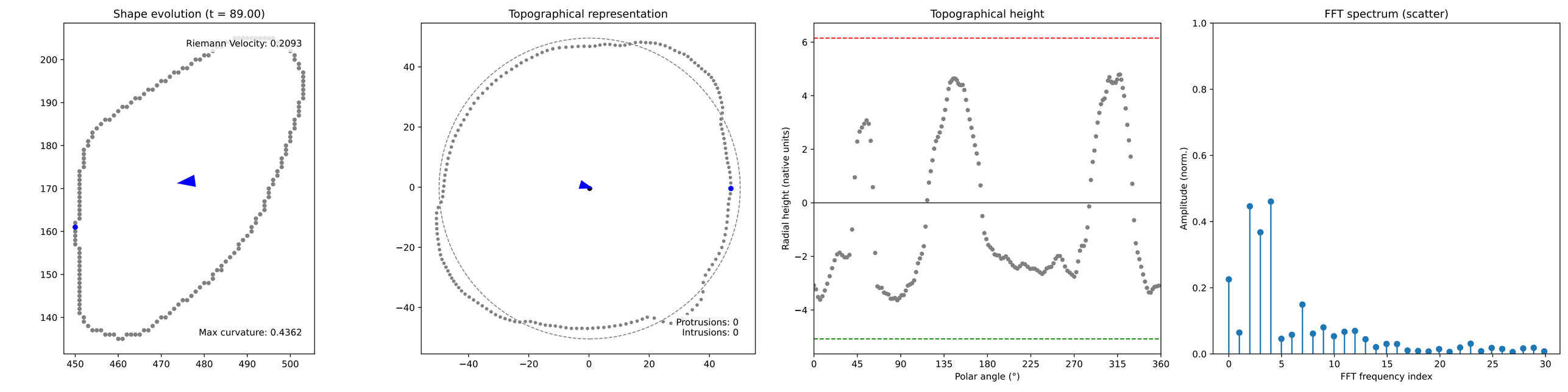

Shape evolution (t = 87.00)
Riemann Velocity: 0.2188
Max curvature: 0.2794
Topographical representation
Protrusions: 0
Intrusions: 0
Topographical height
Radial height (native units)
Polar angle (°)
FFT spectrum (scatter)
Amplitude (norm.)
FFT frequency index

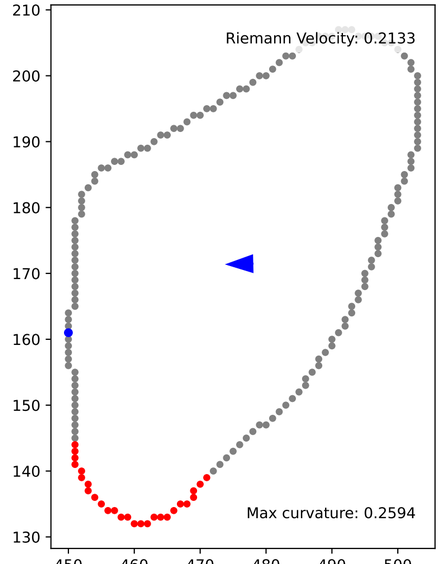

Shape evolution (t = 88.00)
Riemann Velocity: 0.2046
Max curvature: 0.0199
210
200
190
180
170
160
150
140
450
460
470
480
490
500

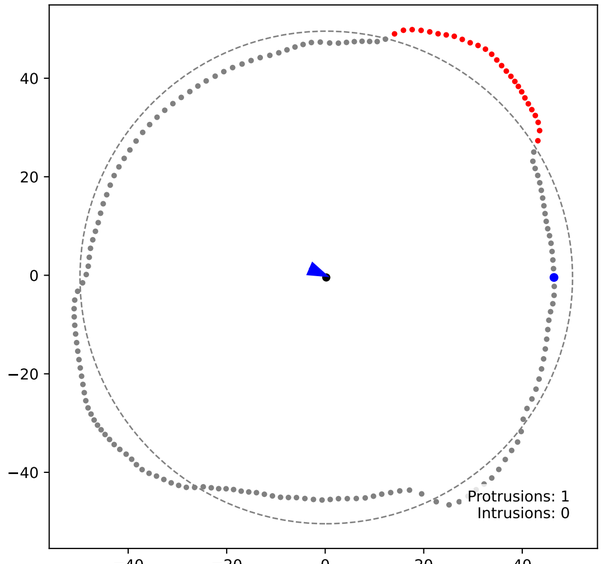

Topographical representation
Protrusions: 0
Intrusions: 0
40
20
0
−20
−40
−40
−20
0
20
40

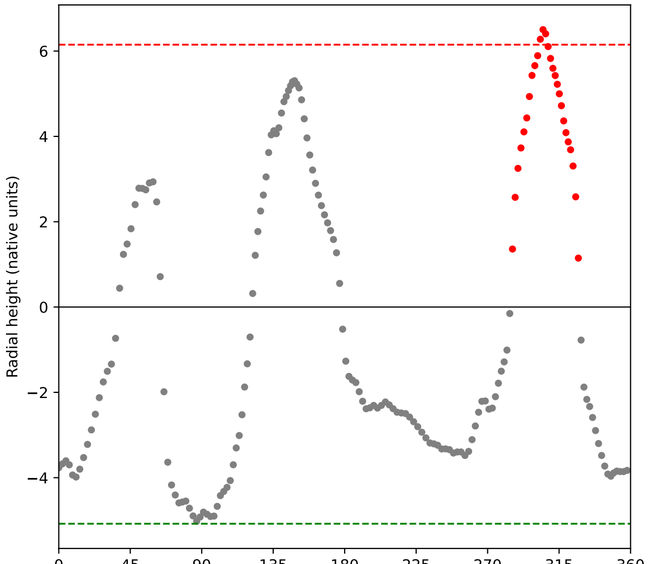

Topographical height
Radial height (native units)
Polar angle (°)
6
4
2
0
−2
−4
0
45
90
135
180
225
270
315
360

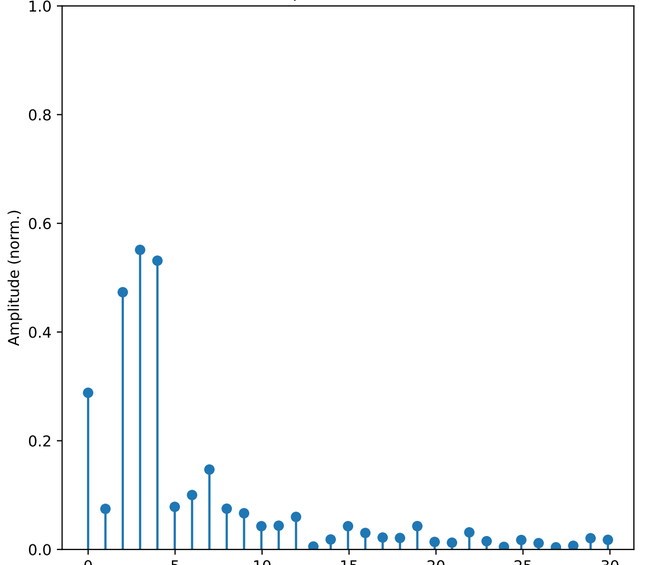

FFT spectrum (scatter)
Amplitude (norm.)
FFT frequency index
1.0
0.8
0.6
0.4
0.2
0.0
0
5
10
15
20
25
30

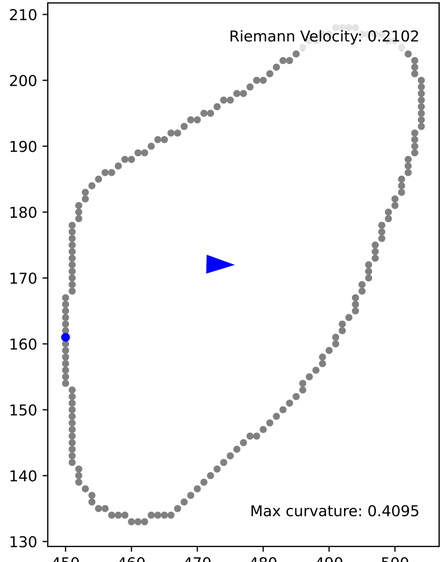

Shape evolution (t = 89.00)
Riemann Velocity: 0.2093
Max curvature: 0.4362
Topographical representation
Protrusions: 0
Intrusions: 0
Topographical height
Radial height (native units)
Polar angle (°)
FFT spectrum (scatter)
Amplitude (norm.)
FFT frequency index

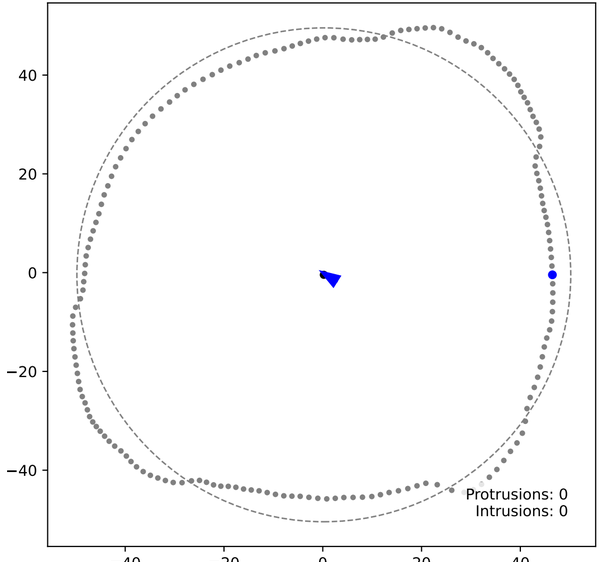

Shape evolution (t = 90.00)
Riemann Velocity: 0.2133
Max curvature: 0.2594
210
200
190
180
170
160
150
140
130
450
460
470
480
490
500

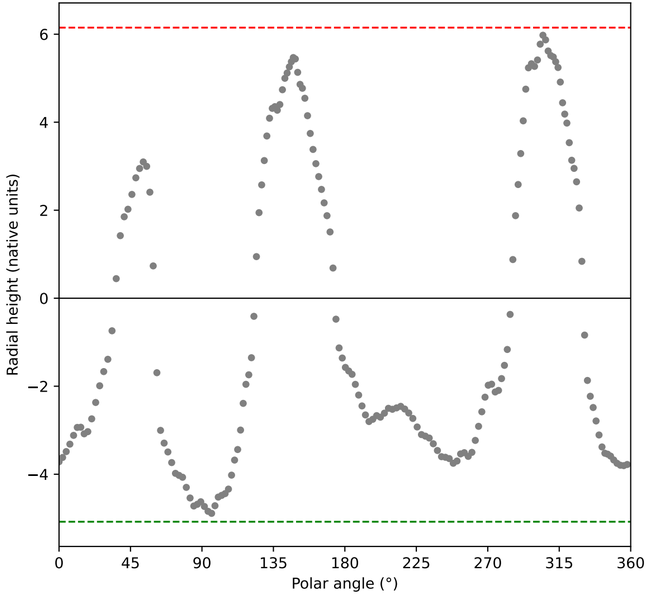

Topographical representation
Protrusions: 1
Intrusions: 0
40
20
0
−20
−40
−40
−20
0
20
40

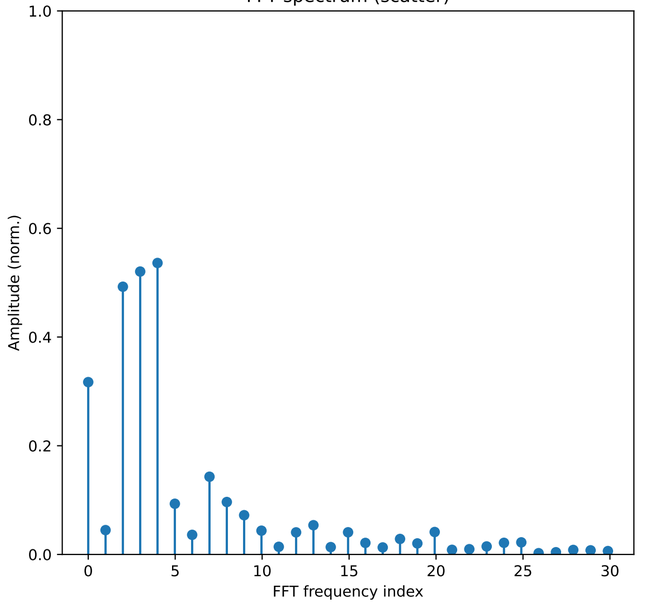

Topographical height
Radial height (native units)
Polar angle (°)
6
4
2
0
−2
−4
0
45
90
135
180
225
270
315
360

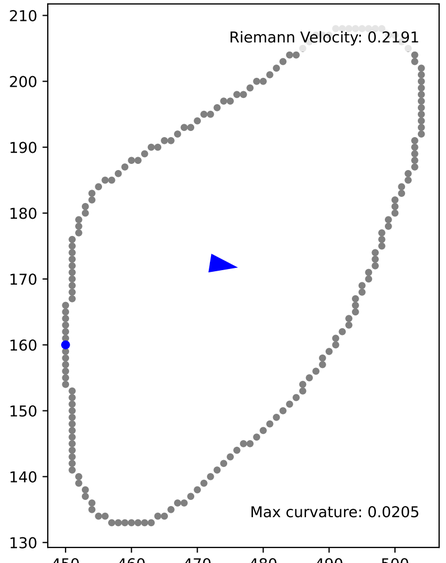

FFT spectrum (scatter)
Amplitude (norm.)
FFT frequency index
1.0
0.8
0.6
0.4
0.2
0.0
0
5
10
15
20
25
30

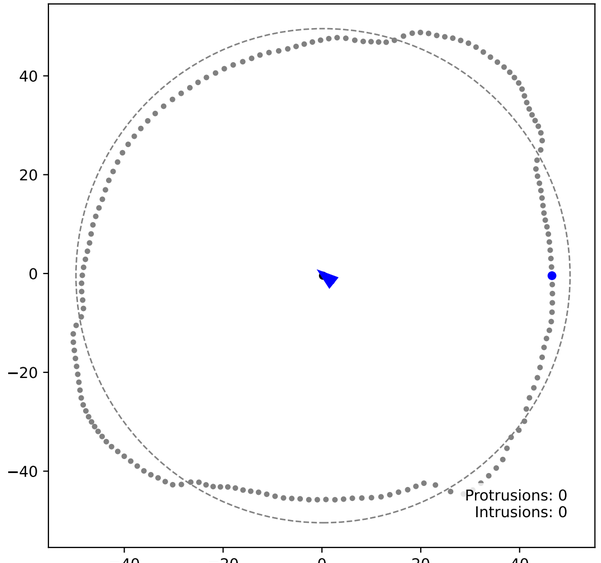

Shape evolution (t = 91.00)
Riemann Velocity: 0.2102
Max curvature: 0.4095

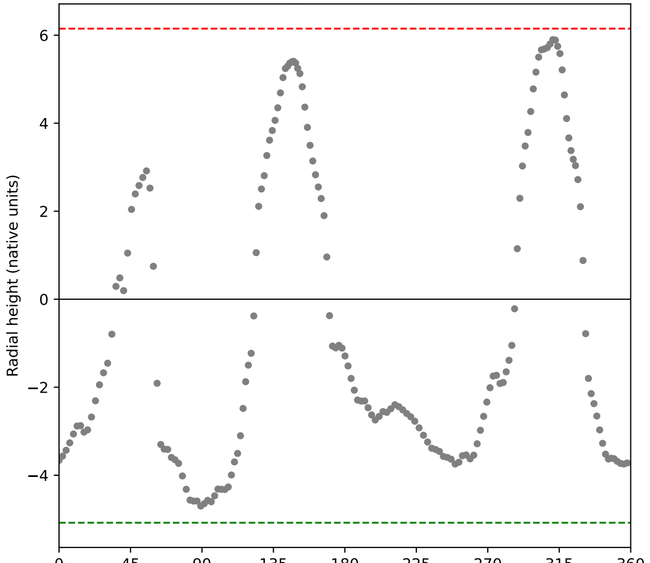

Topographical representation
Protrusions: 0
Intrusions: 0

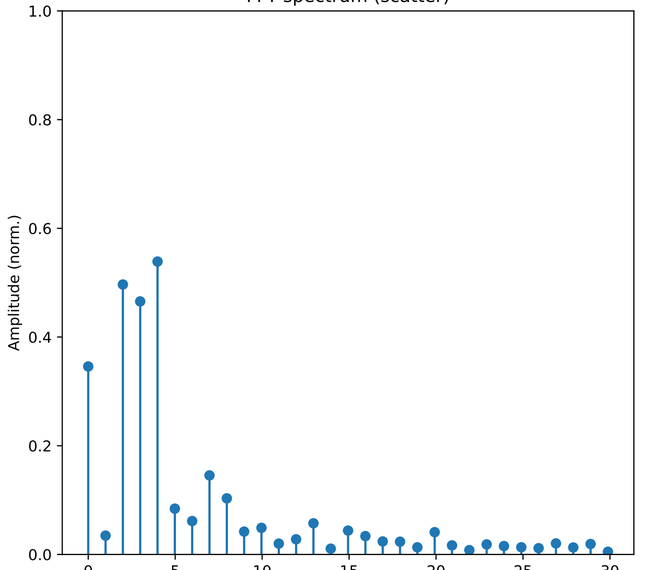

Topographical height
Radial height (native units)
Polar angle (°)

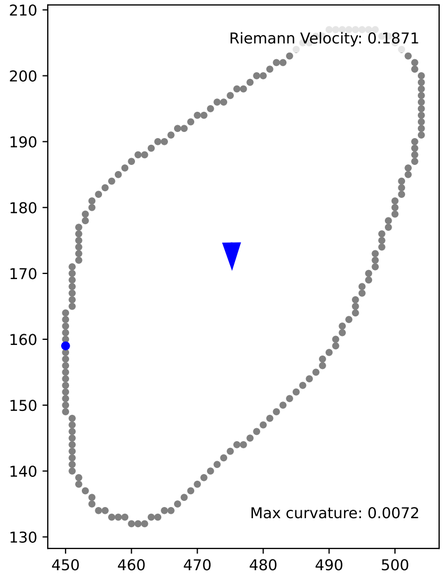

FFT spectrum (scatter)
Amplitude (norm.)
FFT frequency index

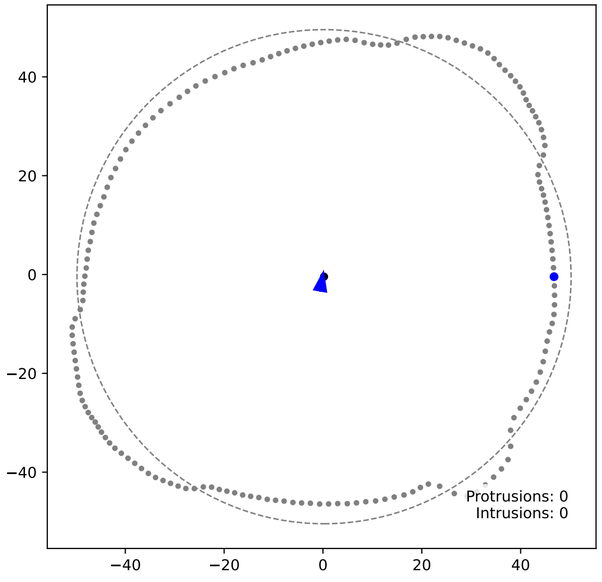

Shape evolution (t = 92.00)
Riemann Velocity: 0.2191
Max curvature: 0.0205
210
200
190
180
170
160
150
140
130
450
460
470
480
490
500

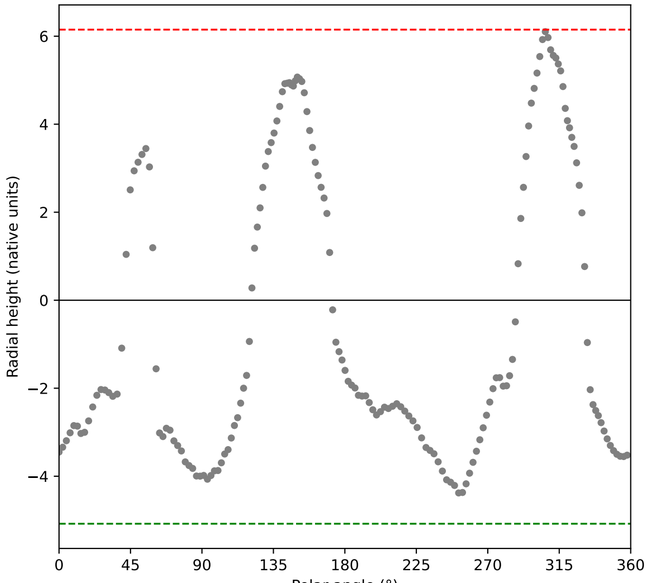

Topographical representation
Protrusions: 0
Intrusions: 0
40
20
0
−20
−40
−40
−20
0
20
40

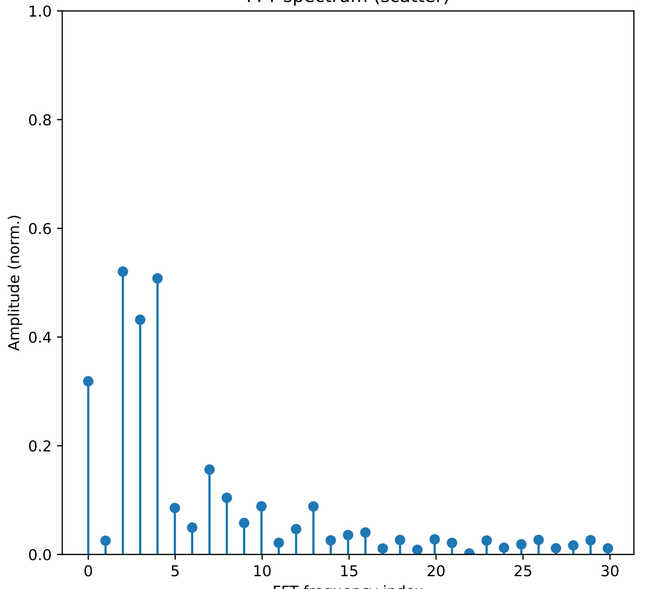

Topographical height
Radial height (native units)
Polar angle (°)
6
4
2
0
−2
−4
0
45
90
135
180
225
270
315
360

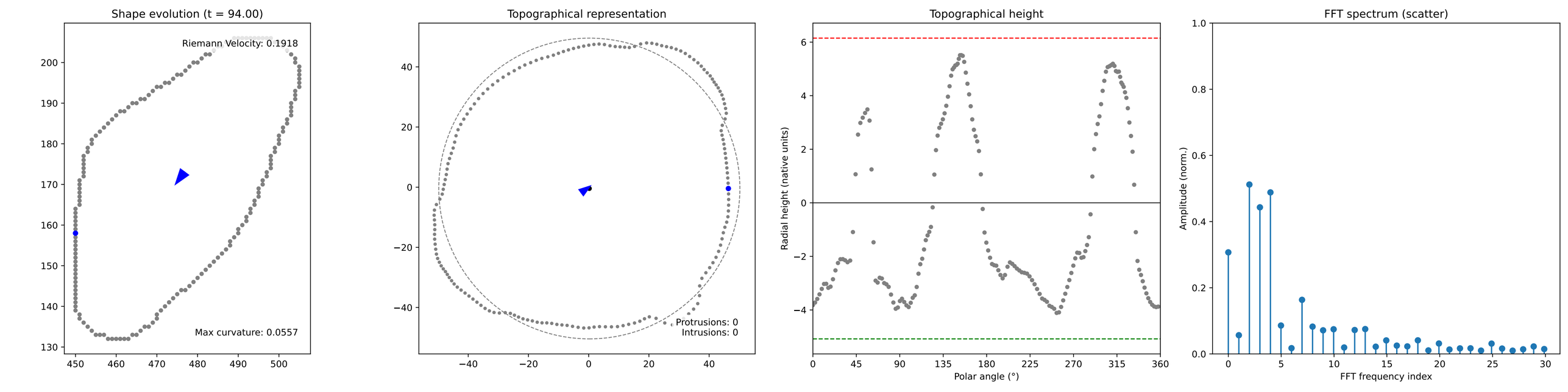

FFT spectrum (scatter)
Amplitude (norm.)
FFT frequency index
1.0
0.8
0.6
0.4
0.2
0.0
0
5
10
15
20
25
30

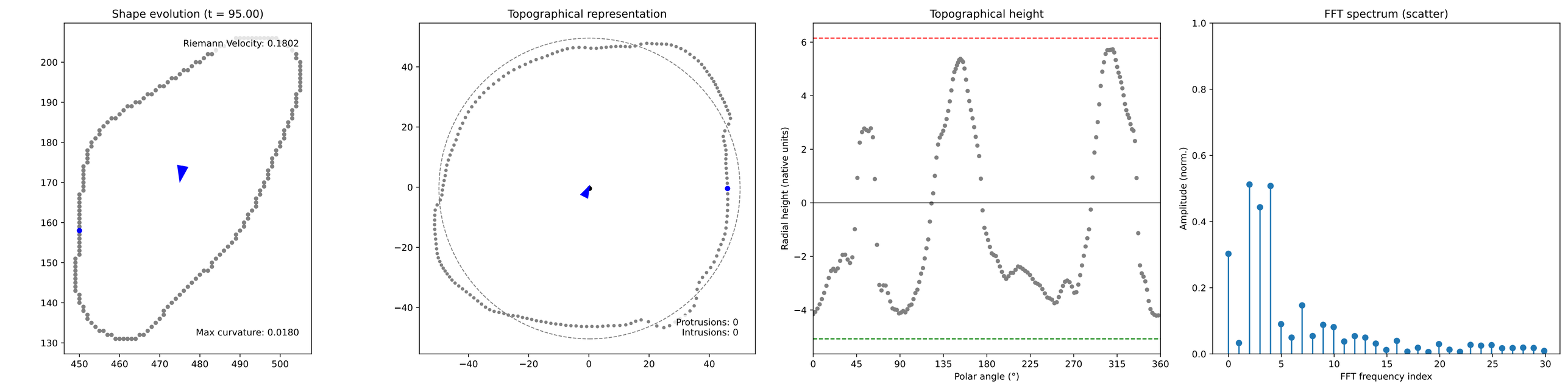

Shape evolution (t = 93.00)
Riemann Velocity: 0.1871
Max curvature: 0.0072

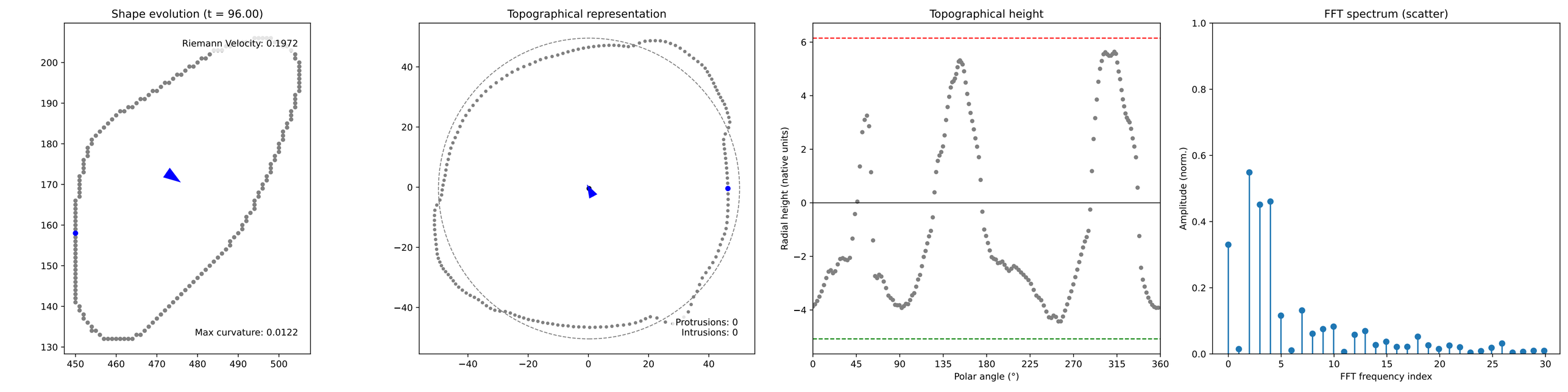

Topographical representation
Protrusions: 0
Intrusions: 0

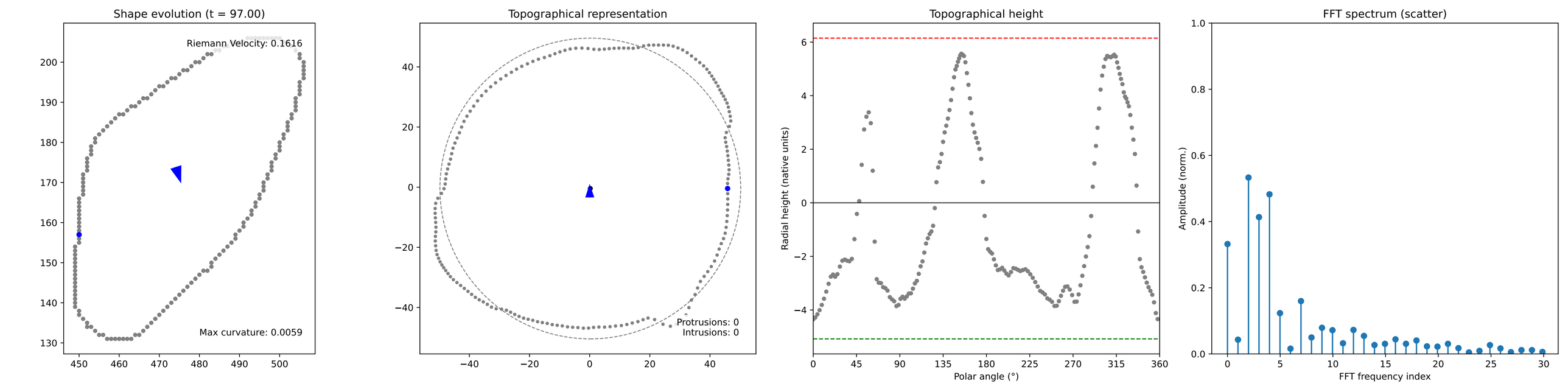

Topographical height
Radial height (native units)
Polar angle (°)

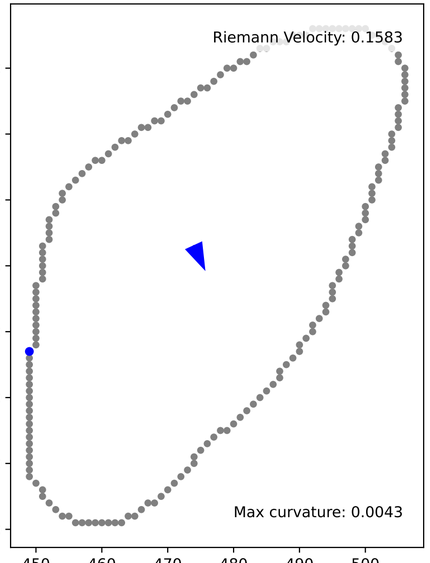

FFT spectrum (scatter)
Amplitude (norm.)
FFT frequency index

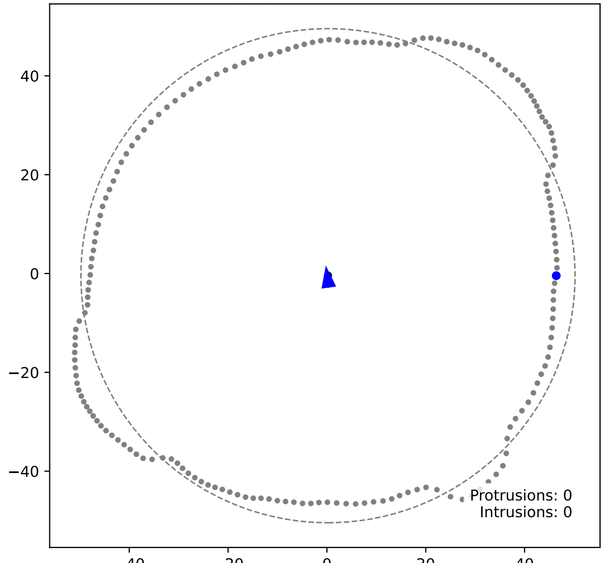

Shape evolution (t = 94.00)
Riemann Velocity: 0.1918
Max curvature: 0.0557
Topographical representation
Protrusions: 0
Intrusions: 0
Topographical height
Radial height (native units)
Polar angle (°)
FFT spectrum (scatter)
Amplitude (norm.)
FFT frequency index

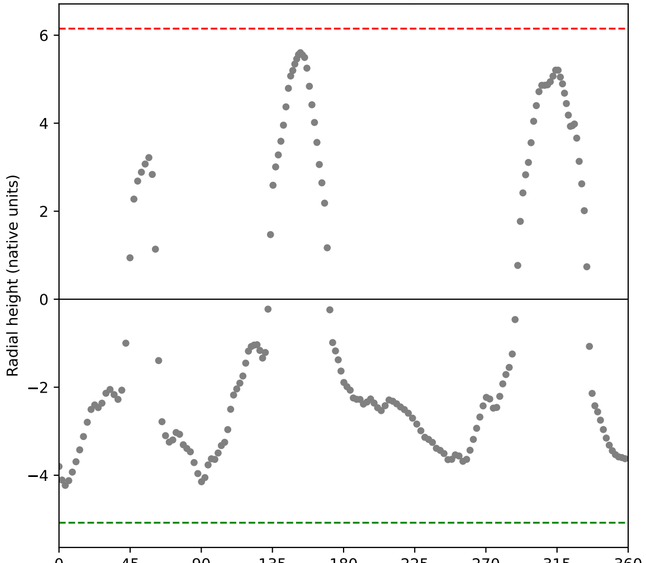

Shape evolution (t = 95.00)
Riemann Velocity: 0.1802
Max curvature: 0.0180
Topographical representation
Protrusions: 0
Intrusions: 0
Topographical height
Radial height (native units)
Polar angle (°)
FFT spectrum (scatter)
Amplitude (norm.)
FFT frequency index

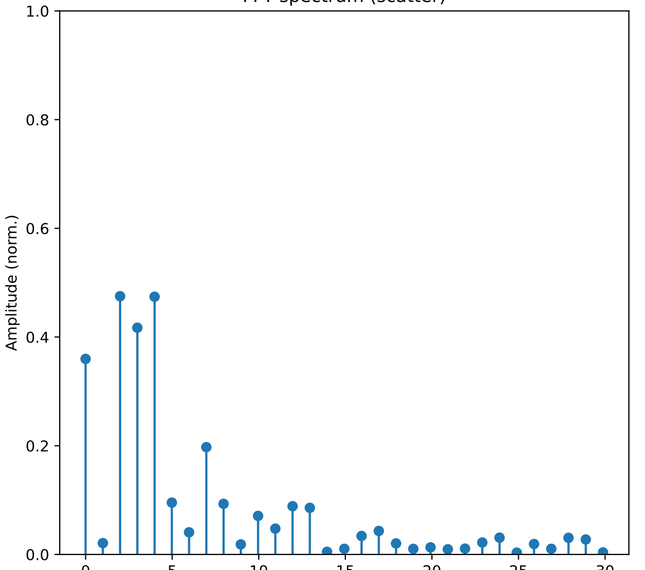

Shape evolution (t = 96.00)
Riemann Velocity: 0.1972
Max curvature: 0.0122
Topographical representation
Protrusions: 0
Intrusions: 0
Topographical height
Radial height (native units)
Polar angle (°)
FFT spectrum (scatter)
Amplitude (norm.)
FFT frequency index

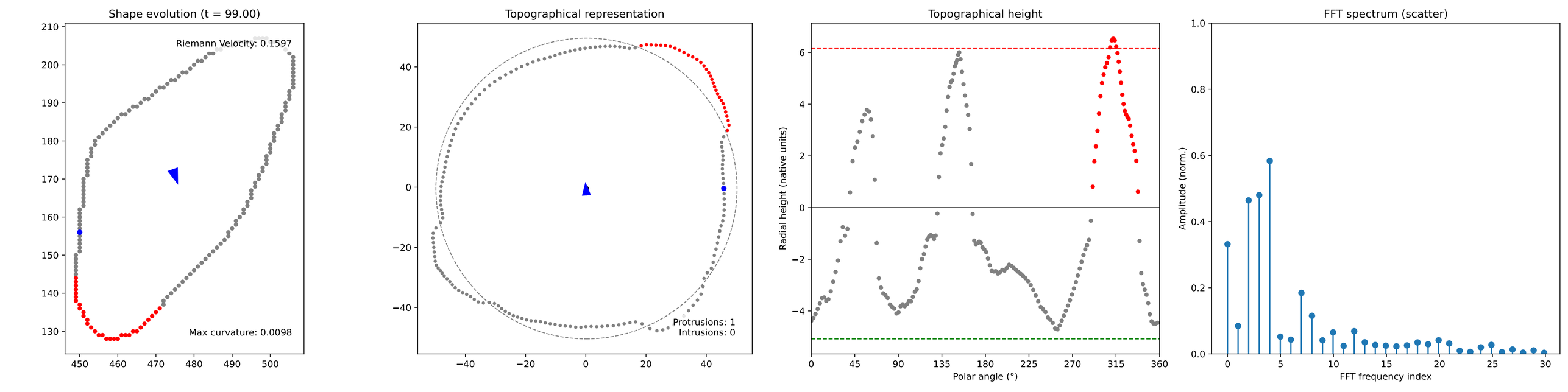

Shape evolution (t = 97.00)
Riemann Velocity: 0.1616
Max curvature: 0.0059
Topographical representation
Protrusions: 0
Intrusions: 0
Topographical height
Radial height (native units)
Polar angle (°)
FFT spectrum (scatter)
Amplitude (norm.)
FFT frequency index

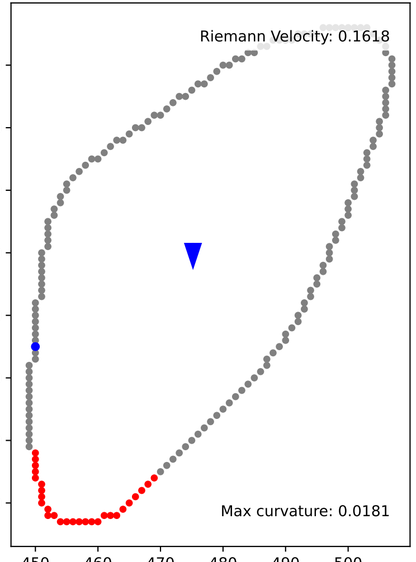

Shape evolution (t = 98.00)
Riemann Velocity: 0.1583
Max curvature: 0.0043
200
190
180
170
160
150
140
130
450
460
470
480
490
500

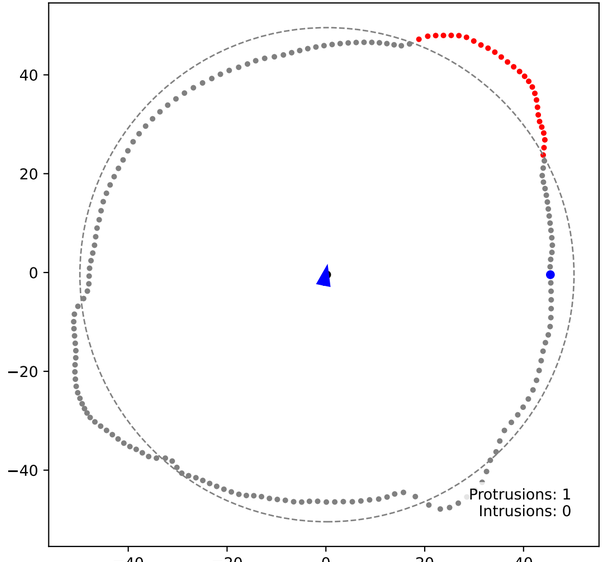

Topographical representation
Protrusions: 0
Intrusions: 0
40
20
0
−20
−40
−40
−20
0
20
40

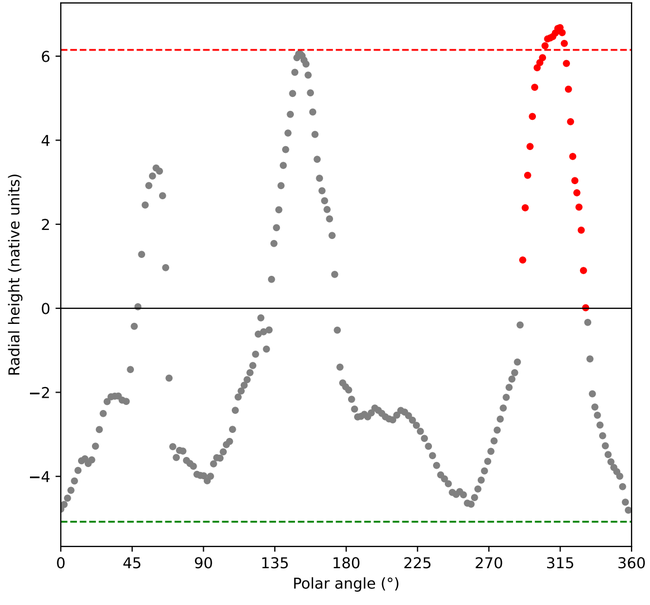

Topographical height
Radial height (native units)
Polar angle (°)
6
4
2
0
−2
−4
0
45
90
135
180
225
270
315
360

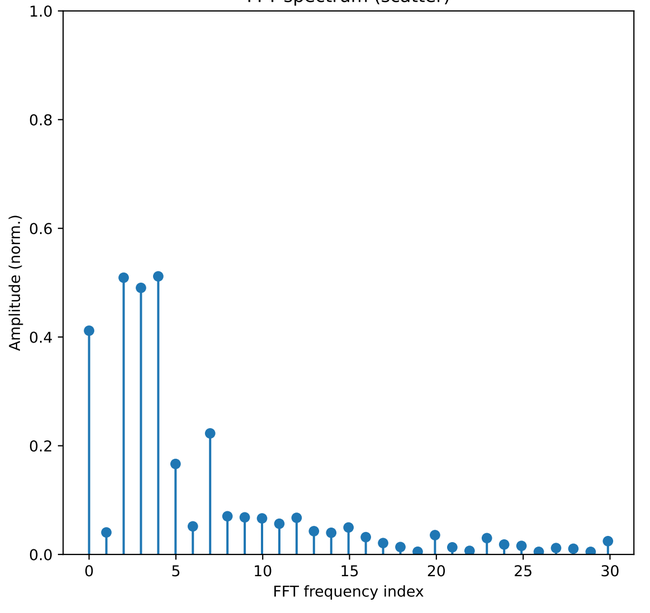

FFT spectrum (scatter)
Amplitude (norm.)
FFT frequency index
1.0
0.8
0.6
0.4
0.2
0.0
0
5
10
15
20
25
30

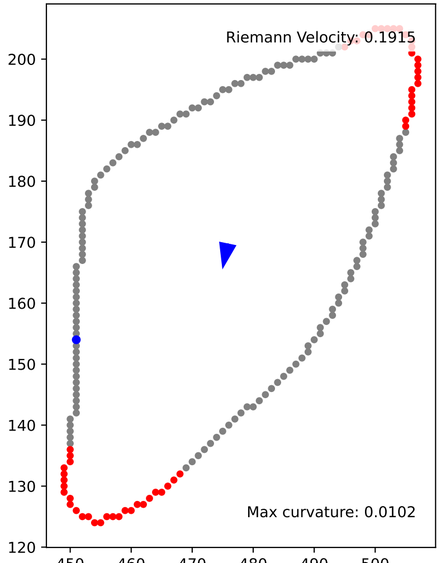

Shape evolution (t = 99.00)
Riemann Velocity: 0.1597
Max curvature: 0.0098
Topographical representation
Protrusions: 1
Intrusions: 0
Topographical height
Radial height (native units)
Polar angle (°)
FFT spectrum (scatter)
Amplitude (norm.)
FFT frequency index

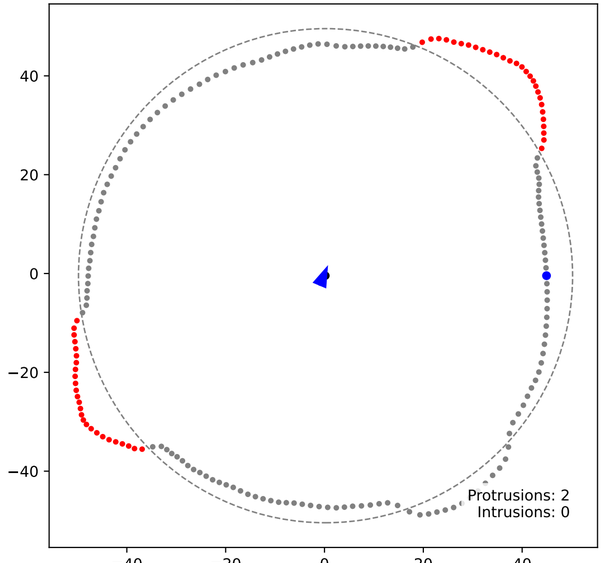

Shape evolution (t = 100.00)
Riemann Velocity: 0.1618
Max curvature: 0.0181
200
190
180
170
160
150
140
130
450
460
470
480
490
500

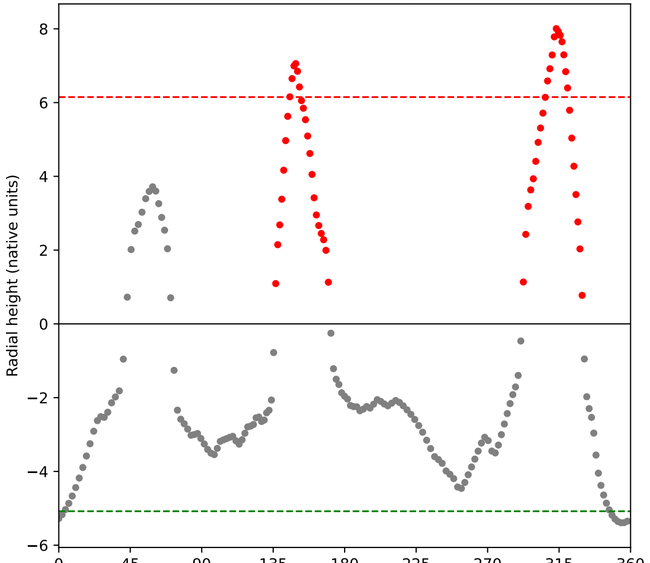

Topographical representation
Protrusions: 1
Intrusions: 0
40
20
0
−20
−40
−40
−20
0
20
40

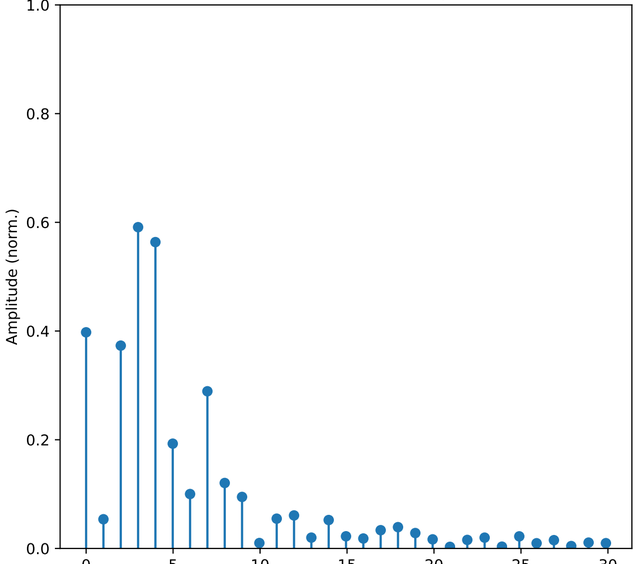

Topographical height
Radial height (native units)
Polar angle (°)
6
4
2
0
−2
−4
0
45
90
135
180
225
270
315
360

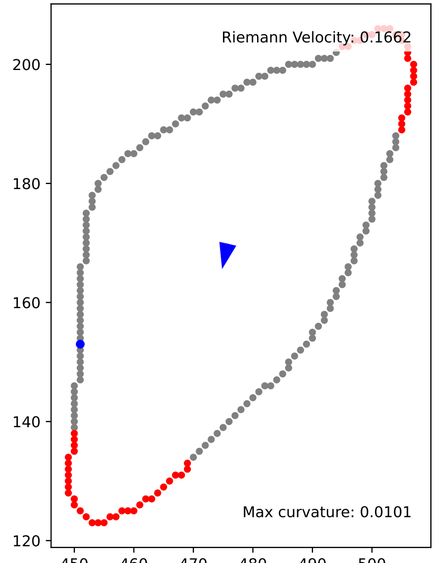

FFT spectrum (scatter)
Amplitude (norm.)
FFT frequency index
1.0
0.8
0.6
0.4
0.2
0.0
0
5
10
15
20
25
30

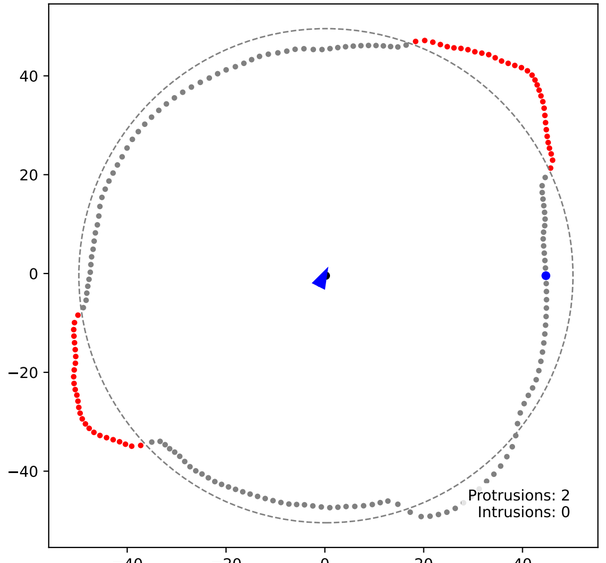

Shape evolution (t = 101.00)
Riemann Velocity: 0.1915
Max curvature: 0.0102
200
190
180
170
160
150
140
130
120
450
460
470
480
490
500

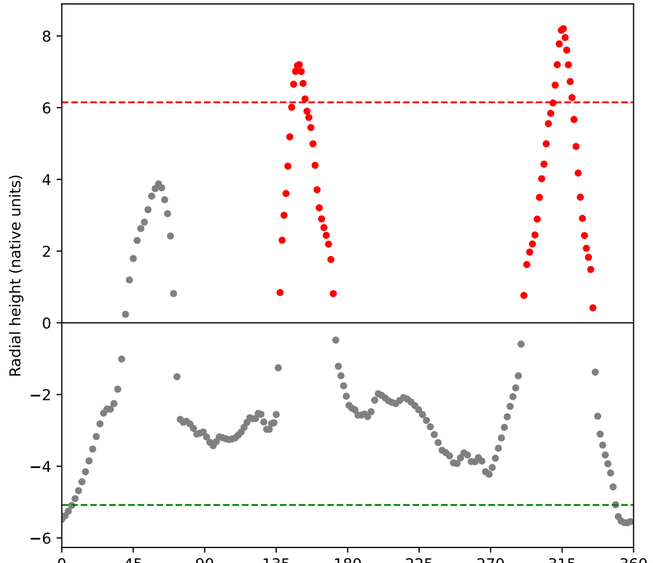

Topographical representation
Protrusions: 2
Intrusions: 0
40
20
0
−20
−40
−40
−20
0
20
40

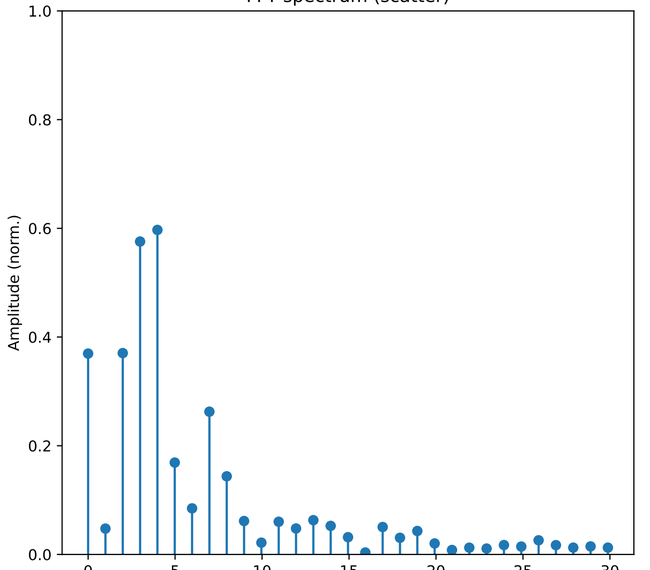

Topographical height
Radial height (native units)
Polar angle (°)
8
6
4
2
0
−2
−4
−6
0
45
90
135
180
225
270
315
360

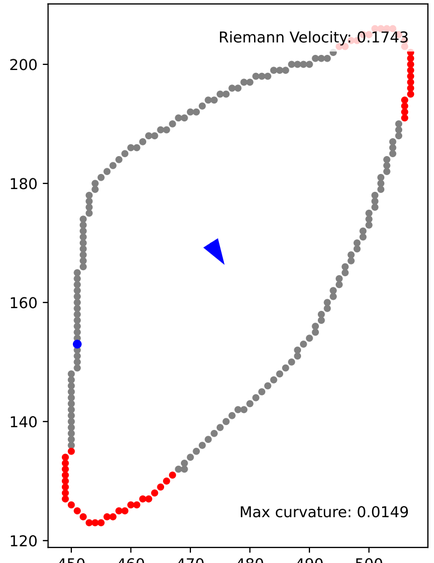

FFT spectrum (scatter)
Amplitude (norm.)
FFT frequency index
1.0
0.8
0.6
0.4
0.2
0.0
0
5
10
15
20
25
30

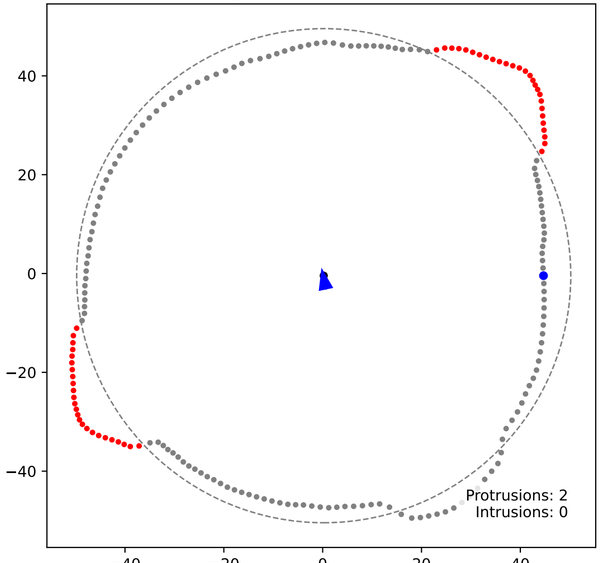

Shape evolution (t = 102.00)
Riemann Velocity: 0.1662
Max curvature: 0.0101
200
180
160
140
120
450
460
470
480
490
500

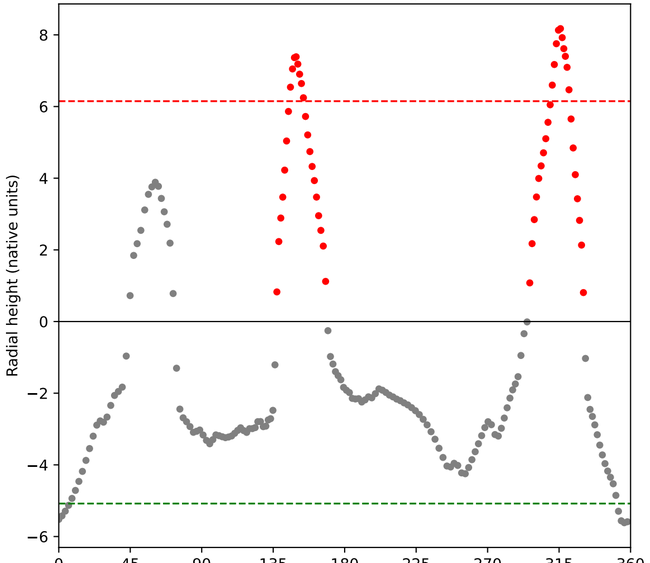

Topographical representation
Protrusions: 2
Intrusions: 0
40
20
0
−20
−40
−40
−20
0
20
40

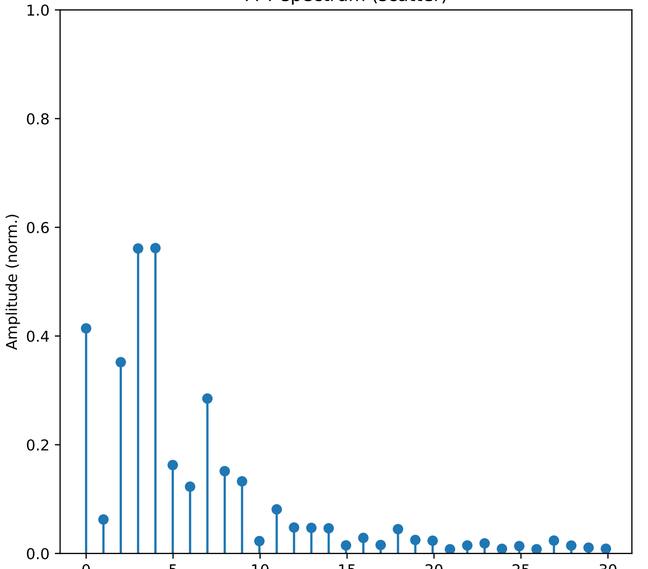

Topographical height
Radial height (native units)
Polar angle (°)
8
6
4
2
0
−2
−4
−6
0
45
90
135
180
225
270
315
360

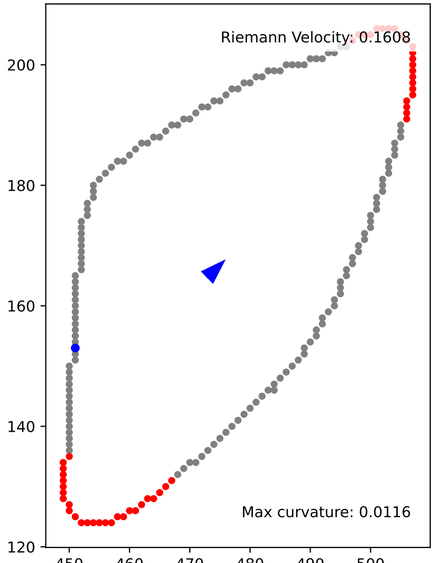

FFT spectrum (scatter)
Amplitude (norm.)
FFT frequency index
1.0
0.8
0.6
0.4
0.2
0.0
0
5
10
15
20
25
30

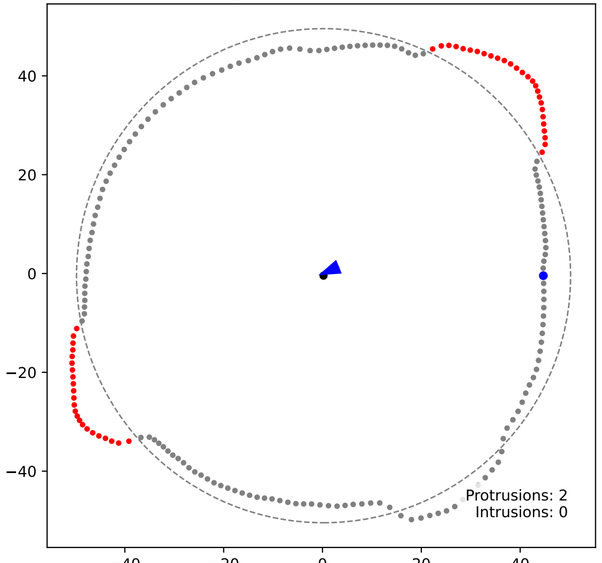

Shape evolution (t = 103.00)
Riemann Velocity: 0.1743
Max curvature: 0.0149
200
180
160
140
120
450
460
470
480
490
500

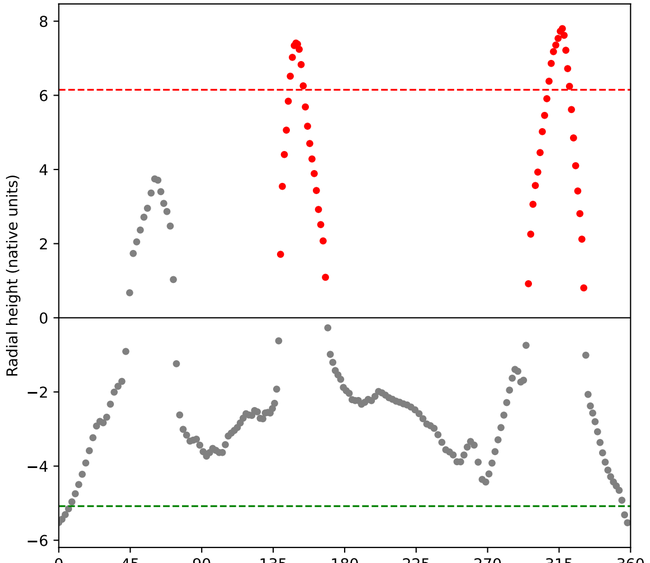

Topographical representation
Protrusions: 2
Intrusions: 0
40
20
0
−20
−40
−40
−20
0
20
40

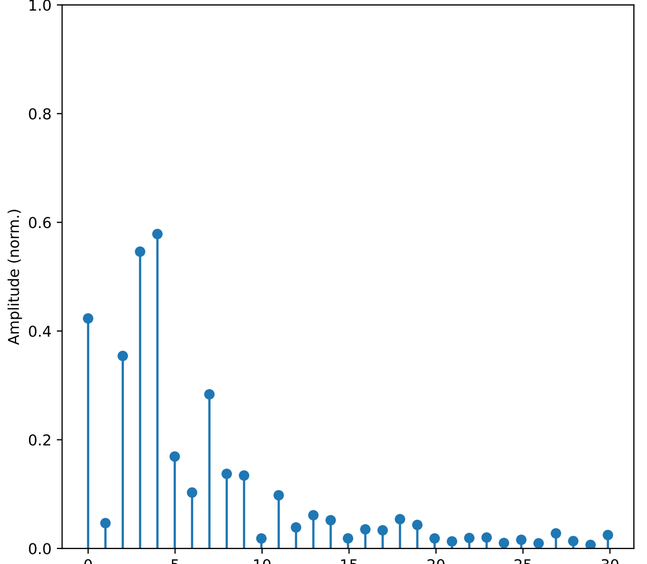

Topographical height
Radial height (native units)
Polar angle (°)
8
6
4
2
0
−2
−4
−6
0
45
90
135
180
225
270
315
360

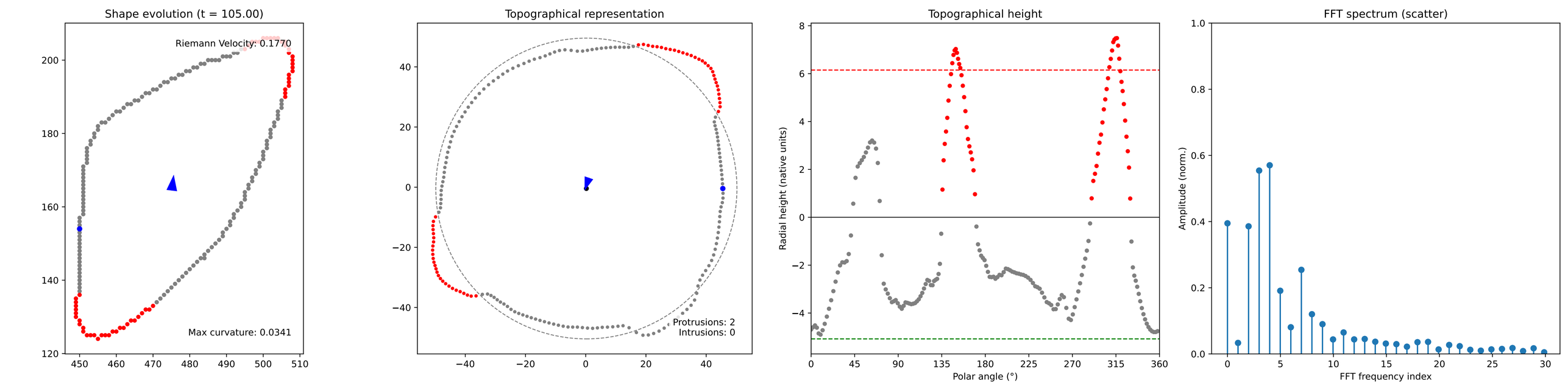

FFT spectrum (scatter)
Amplitude (norm.)
FFT frequency index
1.0
0.8
0.6
0.4
0.2
0.0
0
5
10
15
20
25
30

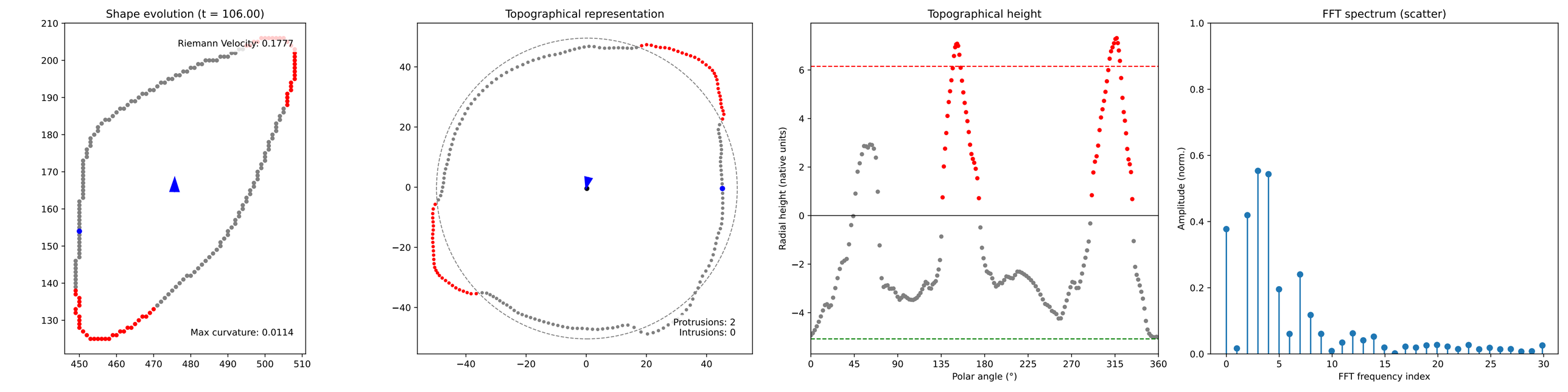

Shape evolution (t = 104.00)
Riemann Velocity: 0.1608
Max curvature: 0.0116
200
180
160
140
120
450
460
470
480
490
500

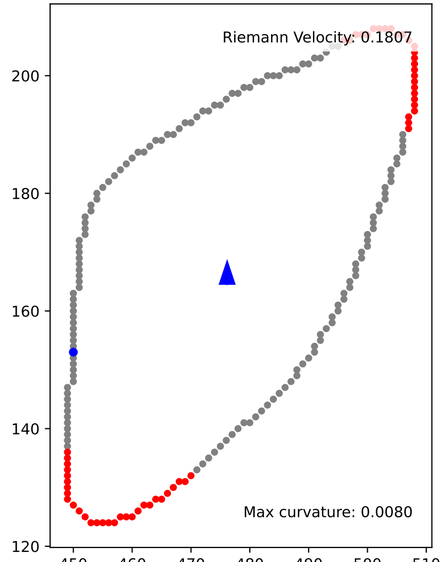

Topographical representation
Protrusions: 2
Intrusions: 0
40
20
0
−20
−40
−40
−20
0
20
40

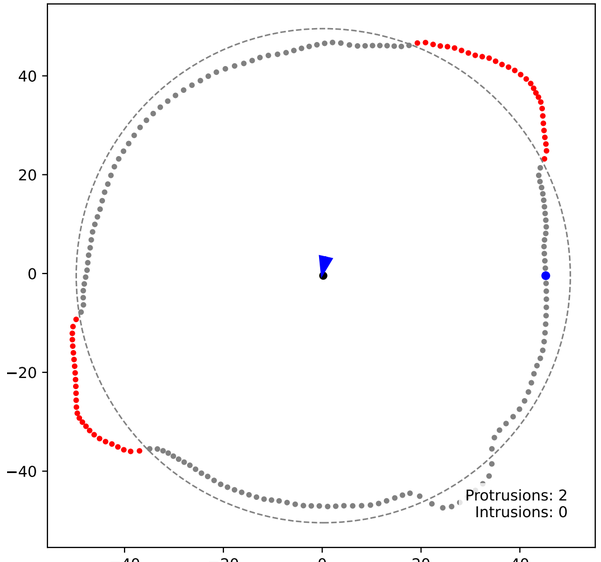

Topographical height
Radial height (native units)
Polar angle (°)
8
6
4
2
0
−2
−4
−6
0
45
90
135
180
225
270
315
360

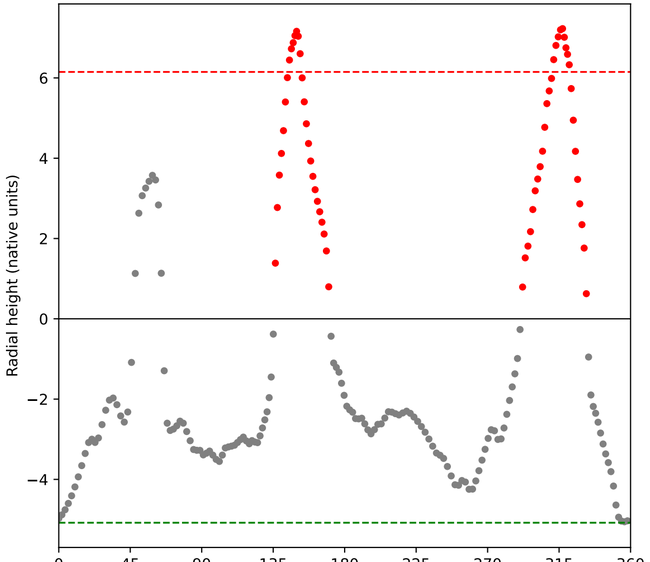

FFT spectrum (scatter)
Amplitude (norm.)
FFT frequency index
1.0
0.8
0.6
0.4
0.2
0.0
0
5
10
15
20
25
30

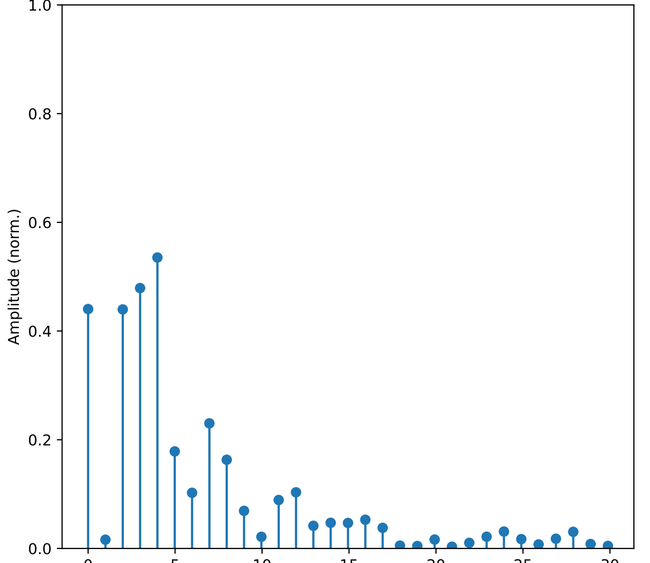

Shape evolution (t = 105.00)
Riemann Velocity: 0.1770
Max curvature: 0.0341
Topographical representation
Protrusions: 2
Intrusions: 0
Topographical height
Radial height (native units)
Polar angle (°)
FFT spectrum (scatter)
Amplitude (norm.)
FFT frequency index

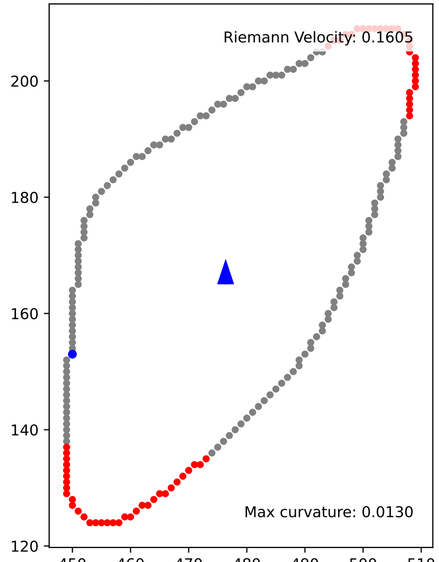

Shape evolution (t = 106.00)
Riemann Velocity: 0.1777
Max curvature: 0.0114
Topographical representation
Protrusions: 2
Intrusions: 0
Topographical height
Radial height (native units)
Polar angle (°)
FFT spectrum (scatter)
Amplitude (norm.)
FFT frequency index

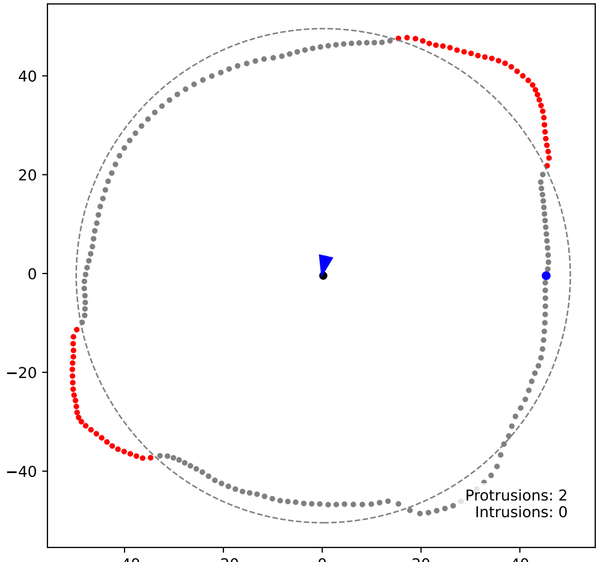

Shape evolution (t = 107.00)
Riemann Velocity: 0.1807
Max curvature: 0.0080
200
180
160
140
120
450
460
470
480
490
500
510

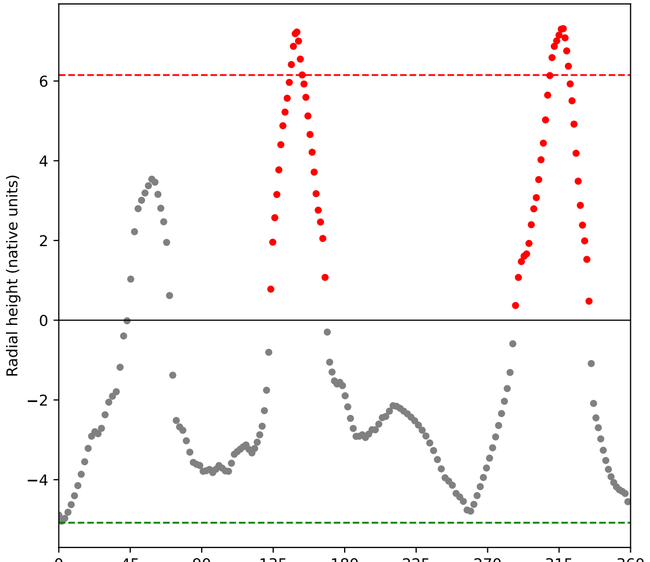

Topographical representation
Protrusions: 2
Intrusions: 0
40
20
0
−20
−40
−40
−20
0
20
40

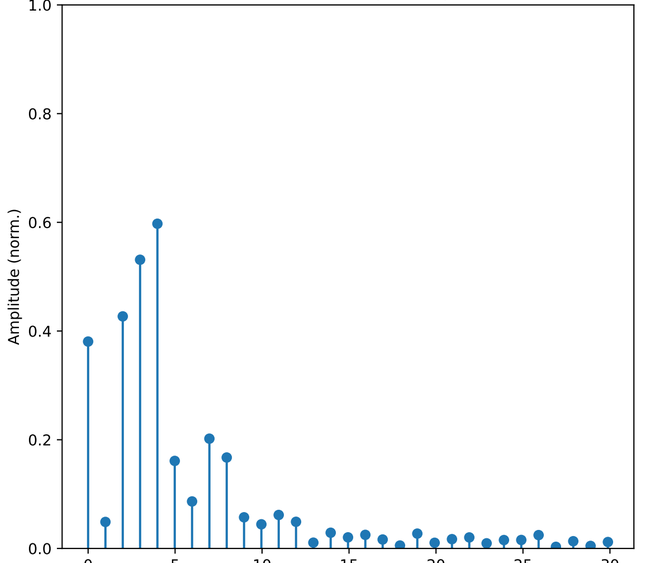

Topographical height
Radial height (native units)
Polar angle (°)
6
4
2
0
−2
−4
0
45
90
135
180
225
270
315
360

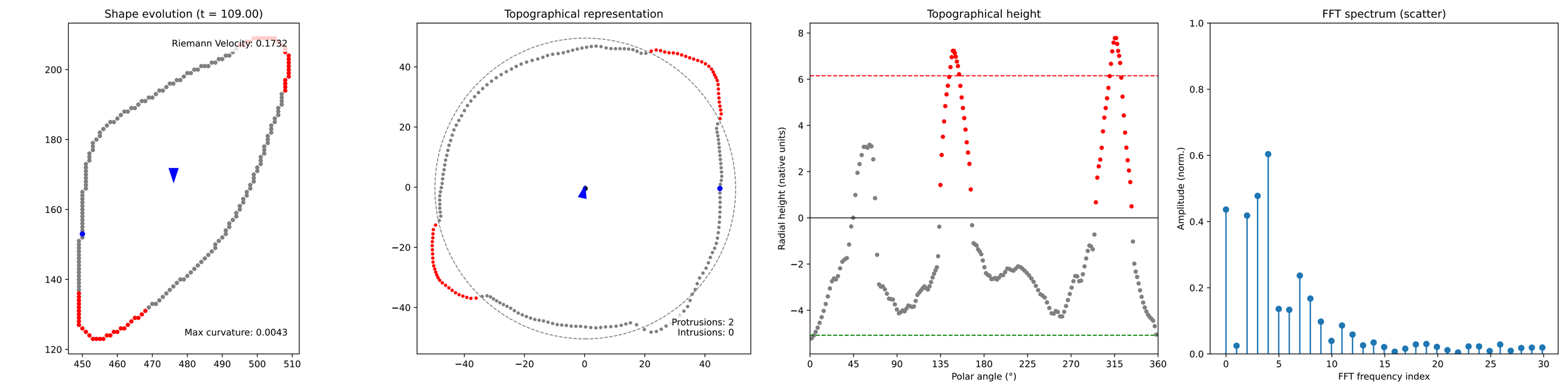

FFT spectrum (scatter)
Amplitude (norm.)
FFT frequency index
1.0
0.8
0.6
0.4
0.2
0.0
0
5
10
15
20
25
30

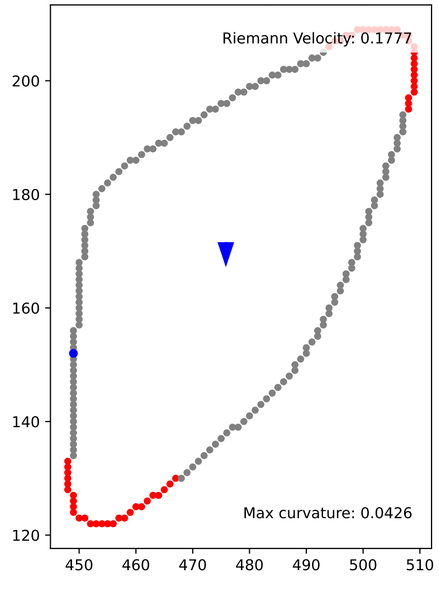

Shape evolution (t = 108.00)
Riemann Velocity: 0.1605
Max curvature: 0.0130
200
180
160
140
120
450
460
470
480
490
500
510

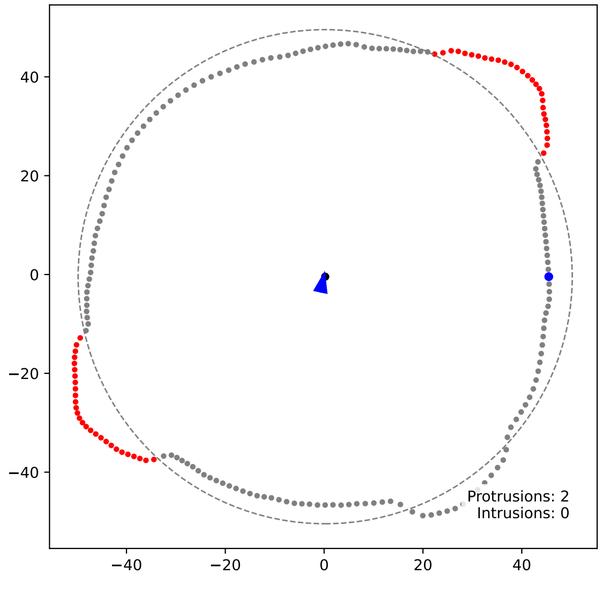

Topographical representation
Protrusions: 2
Intrusions: 0
40
20
0
−20
−40
−40
−20
0
20
40

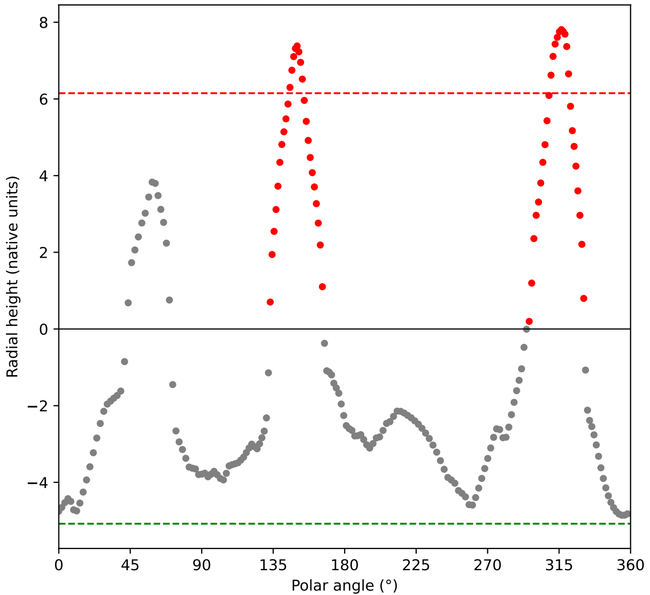

Topographical height
Radial height (native units)
Polar angle (°)
6
4
2
0
−2
−4
0
45
90
135
180
225
270
315
360

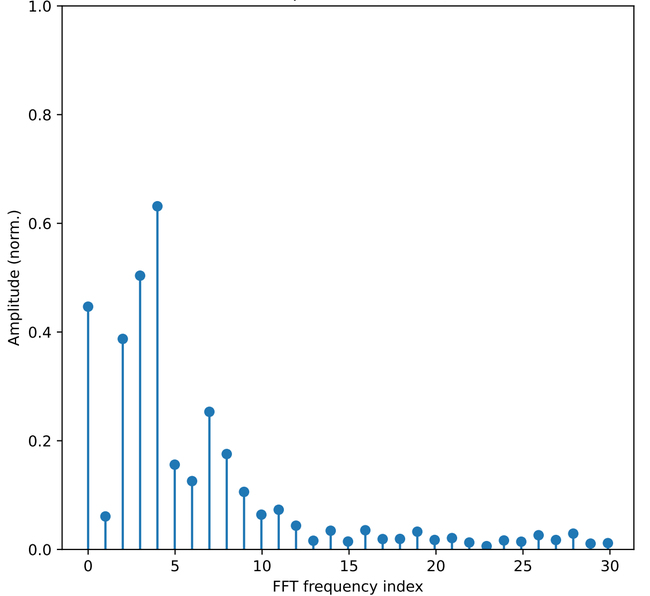

FFT spectrum (scatter)
Amplitude (norm.)
FFT frequency index
1.0
0.8
0.6
0.4
0.2
0.0
0
5
10
15
20
25
30

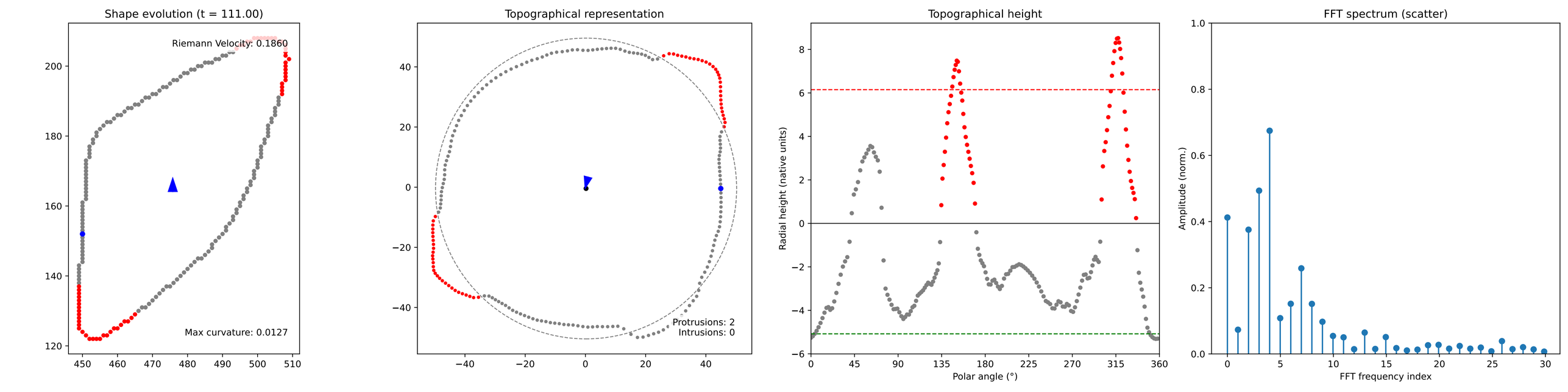

Shape evolution (t = 109.00)
Riemann Velocity: 0.1732
Max curvature: 0.0043
Topographical representation
Protrusions: 2
Intrusions: 0
Topographical height
Radial height (native units)
Polar angle (°)
FFT spectrum (scatter)
Amplitude (norm.)
FFT frequency index

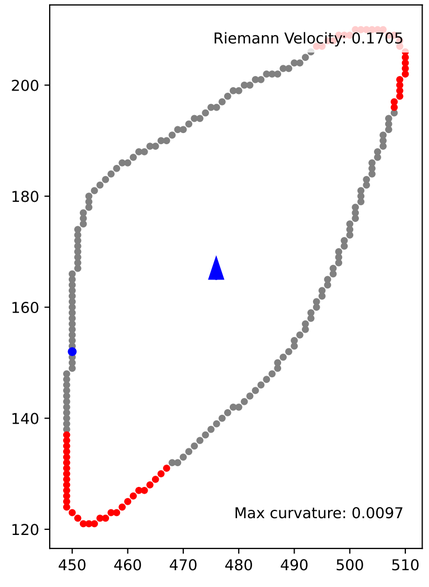

Shape evolution (t = 110.00)
Riemann Velocity: 0.1777
Max curvature: 0.0426
200
180
160
140
120
450
460
470
480
490
500
510

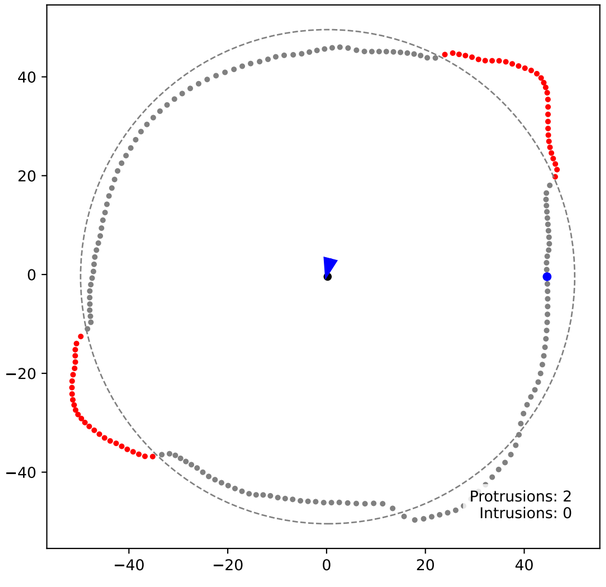

Topographical representation
Protrusions: 2
Intrusions: 0
40
20
0
−20
−40
−40
−20
0
20
40

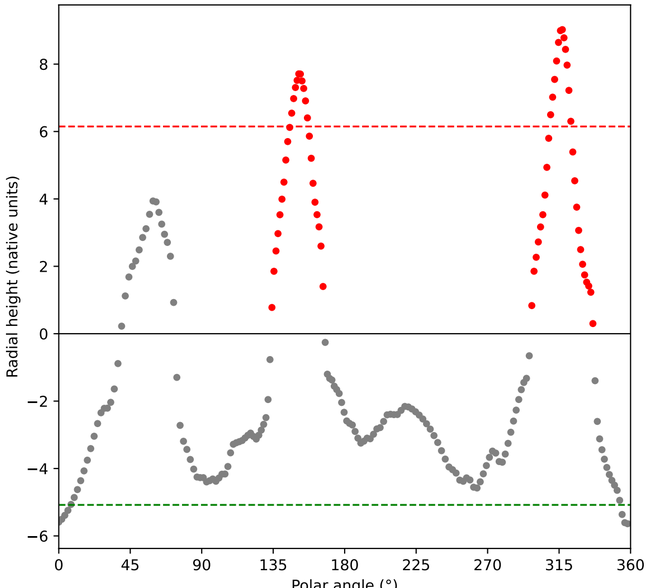

Topographical height
Radial height (native units)
Polar angle (°)
8
6
4
2
0
−2
−4
0
45
90
135
180
225
270
315
360

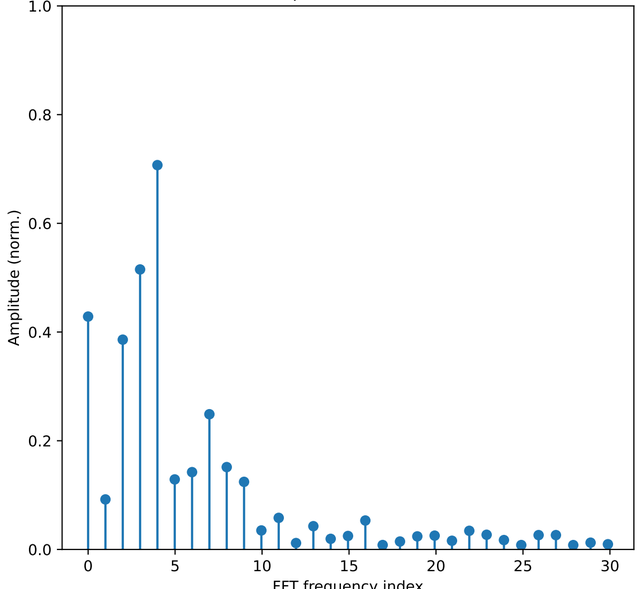

FFT spectrum (scatter)
Amplitude (norm.)
FFT frequency index
1.0
0.8
0.6
0.4
0.2
0.0
0
5
10
15
20
25
30

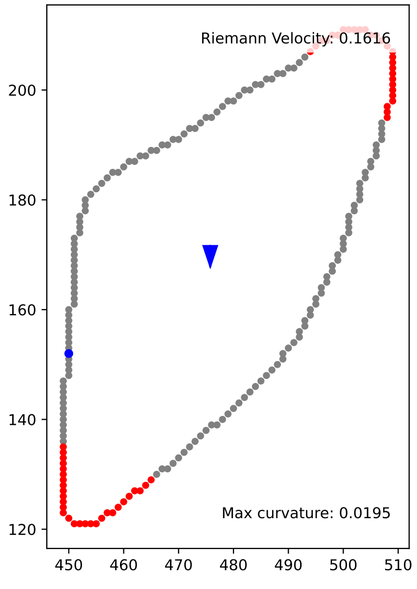

Shape evolution (t = 111.00)
Riemann Velocity: 0.1860
Max curvature: 0.0127
Topographical representation
Protrusions: 2
Intrusions: 0
Topographical height
Radial height (native units)
Polar angle (°)
FFT spectrum (scatter)
Amplitude (norm.)
FFT frequency index

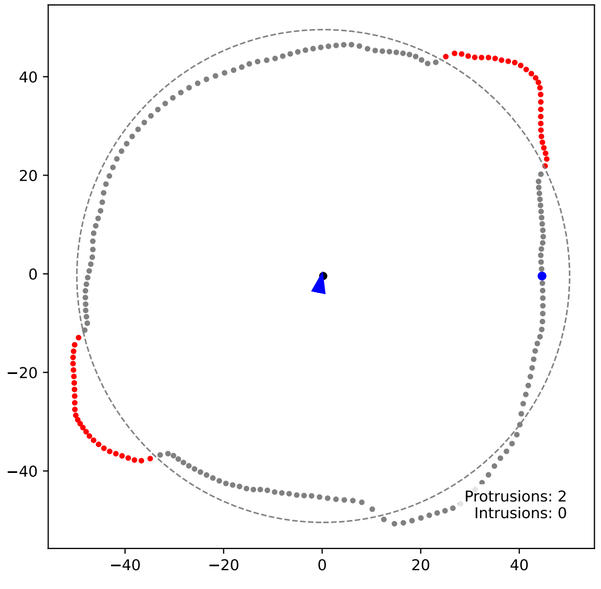

Shape evolution (t = 112.00)
Riemann Velocity: 0.1705
Max curvature: 0.0097
200
180
160
140
120
450
460
470
480
490
500
510

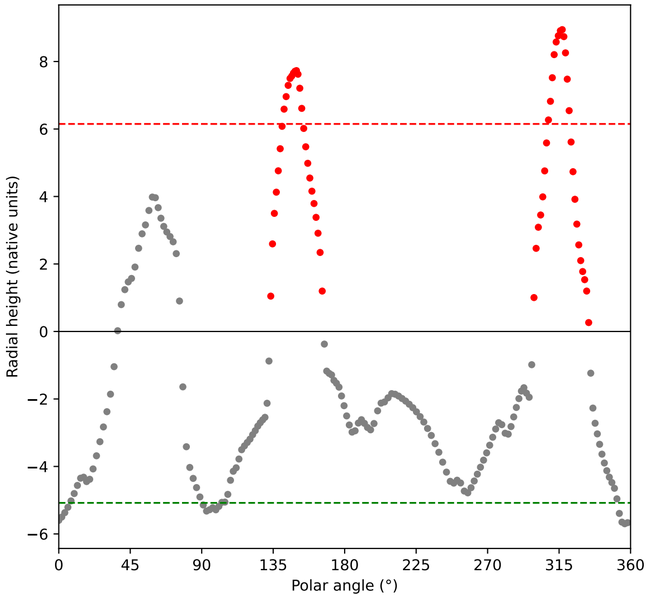

Topographical representation
Protrusions: 2
Intrusions: 0
40
20
0
−20
−40
−40
−20
0
20
40

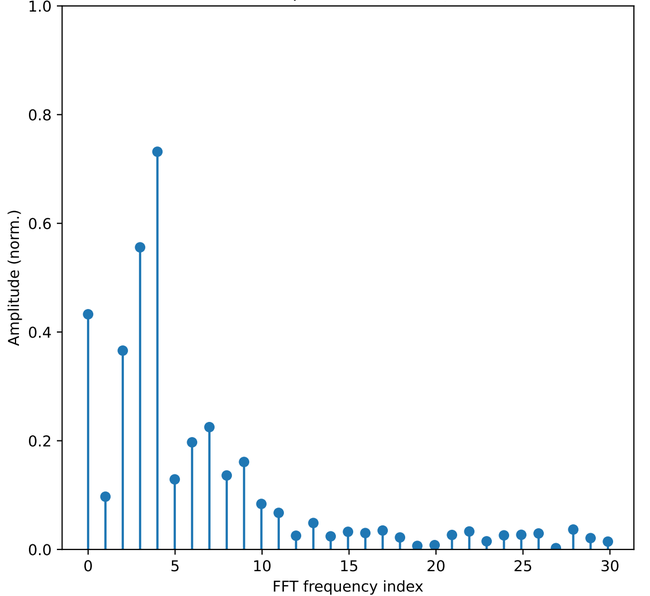

Topographical height
Radial height (native units)
Polar angle (°)
8
6
4
2
0
−2
−4
−6
0
45
90
135
180
225
270
315
360

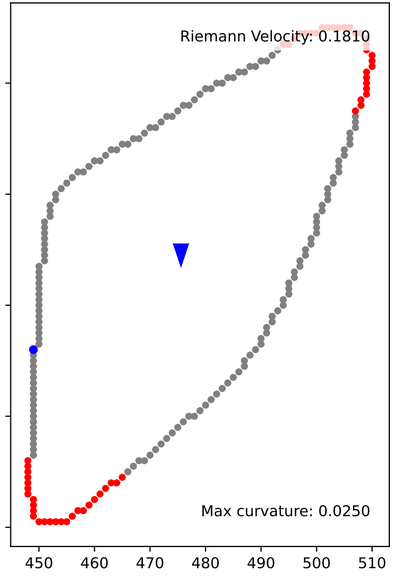

FFT spectrum (scatter)
Amplitude (norm.)
FFT frequency index
1.0
0.8
0.6
0.4
0.2
0.0
0
5
10
15
20
25
30

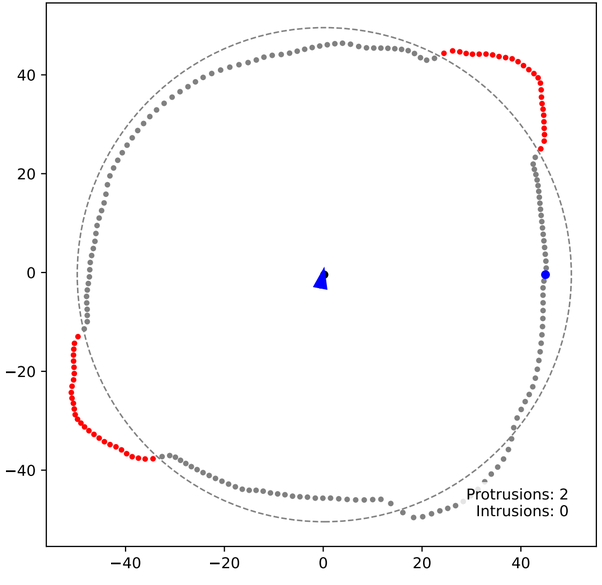

Shape evolution (t = 113.00)
Riemann Velocity: 0.1616
Max curvature: 0.0195
200
180
160
140
120
450
460
470
480
490
500
510

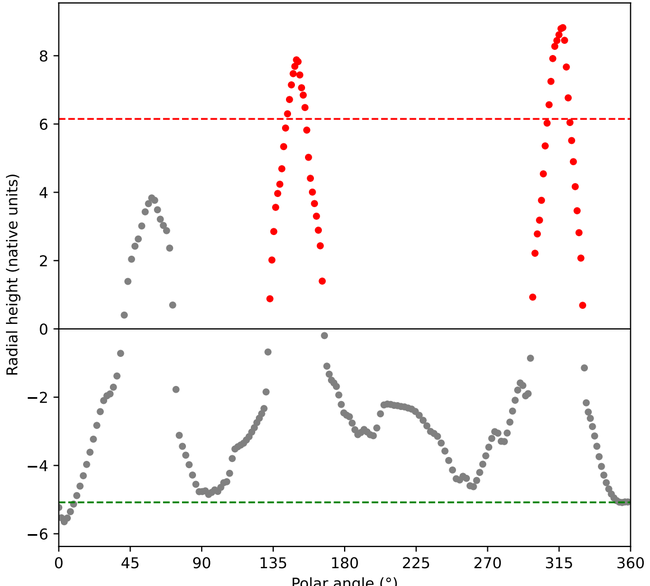

Topographical representation
Protrusions: 2
Intrusions: 0
40
20
0
−20
−40
−40
−20
0
20
40

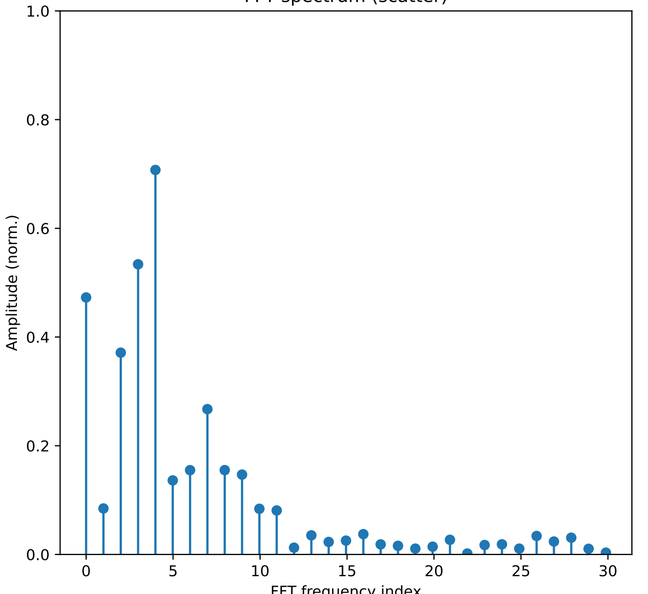

Topographical height
Radial height (native units)
Polar angle (°)
8
6
4
2
0
−2
−4
−6
0
45
90
135
180
225
270
315
360

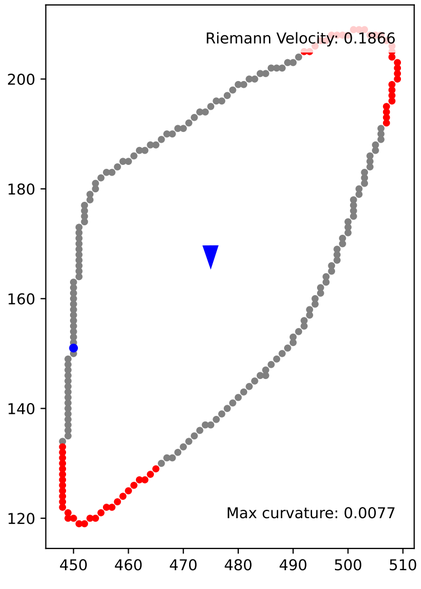

FFT spectrum (scatter)
Amplitude (norm.)
FFT frequency index
1.0
0.8
0.6
0.4
0.2
0.0
0
5
10
15
20
25
30

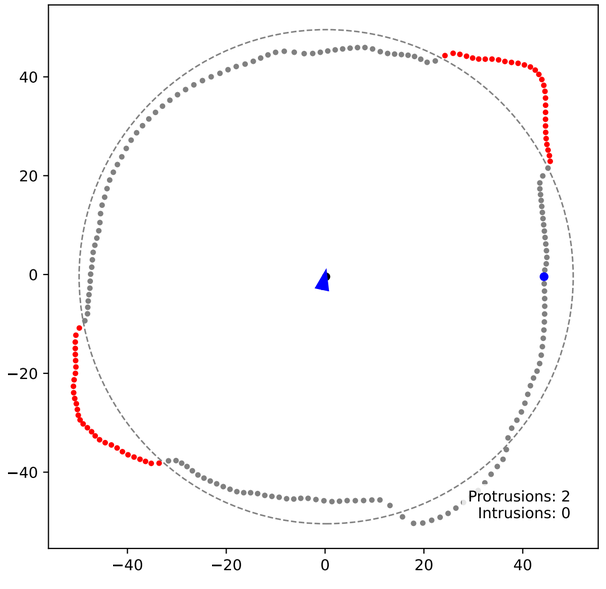

Shape evolution (t = 114.00)
Riemann Velocity: 0.1810
Max curvature: 0.0250
200
180
160
140
120
450
460
470
480
490
500
510

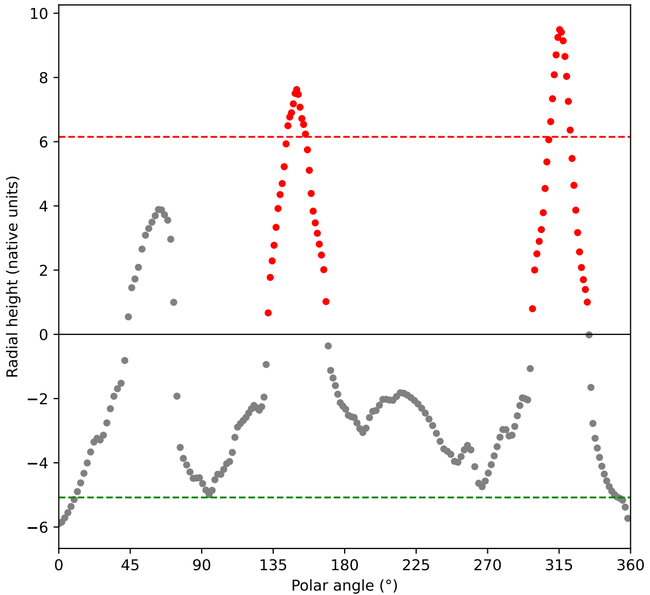

Topographical representation
Protrusions: 2
Intrusions: 0
40
20
0
−20
−40
−40
−20
0
20
40

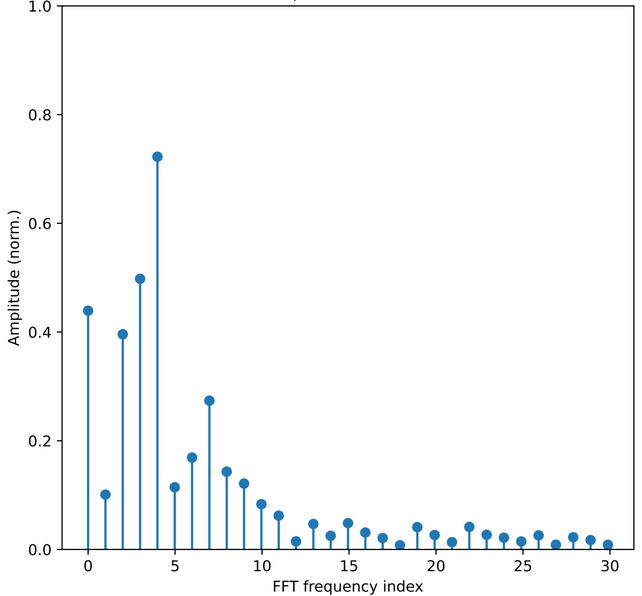

Topographical height
Radial height (native units)
Polar angle (°)
8
6
4
2
0
−2
−4
−6
0
45
90
135
180
225
270
315
360

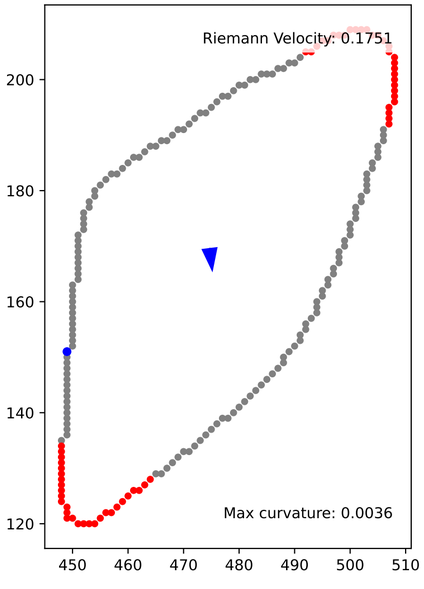

FFT spectrum (scatter)
Amplitude (norm.)
FFT frequency index
1.0
0.8
0.6
0.4
0.2
0.0
0
5
10
15
20
25
30

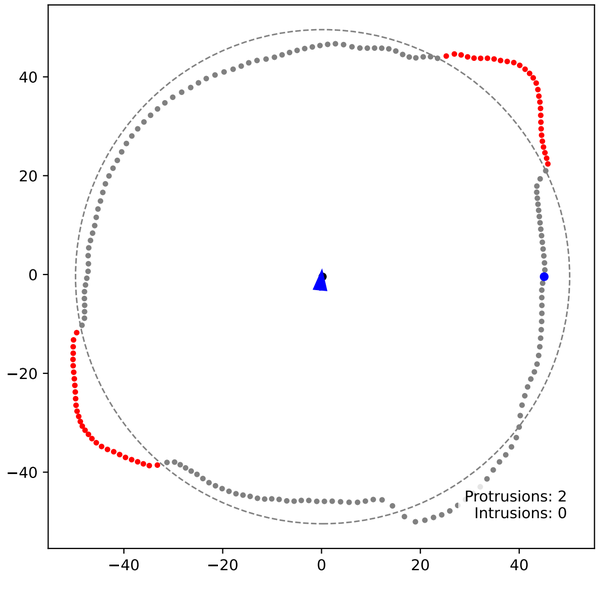

Shape evolution (t = 115.00)
Riemann Velocity: 0.1866
Max curvature: 0.0077
200
180
160
140
120
450
460
470
480
490
500
510

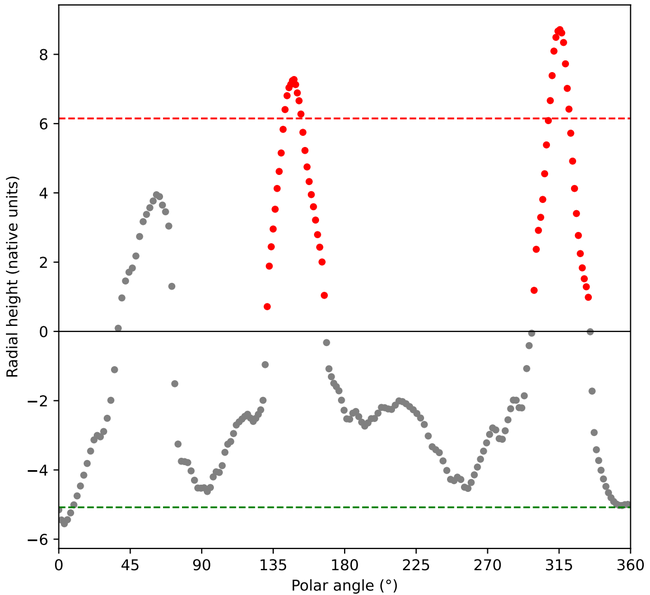

Topographical representation
Protrusions: 2
Intrusions: 0
40
20
0
−20
−40
−40
−20
0
20
40

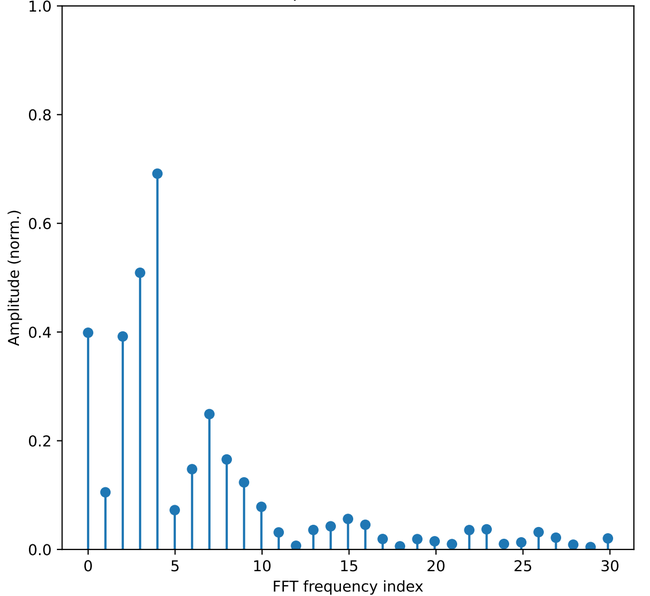

Topographical height
Radial height (native units)
Polar angle (°)
10
8
6
4
2
0
−2
−4
−6
0
45
90
135
180
225
270
315
360

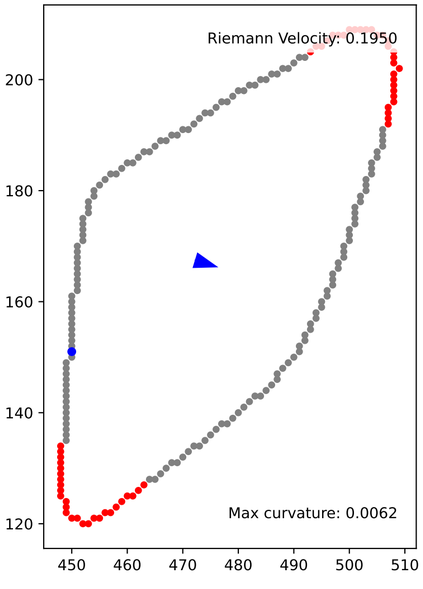

FFT spectrum (scatter)
Amplitude (norm.)
FFT frequency index
1.0
0.8
0.6
0.4
0.2
0.0
0
5
10
15
20
25
30

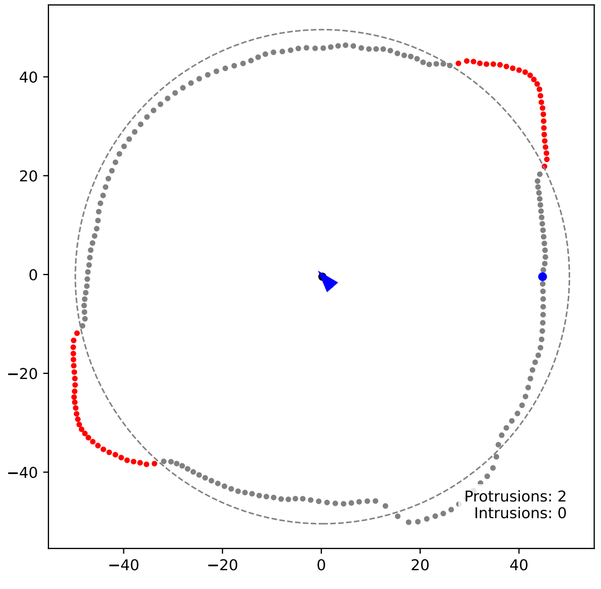

Shape evolution (t = 116.00)
Riemann Velocity: 0.1751
Max curvature: 0.0036
200
180
160
140
120
450
460
470
480
490
500
510

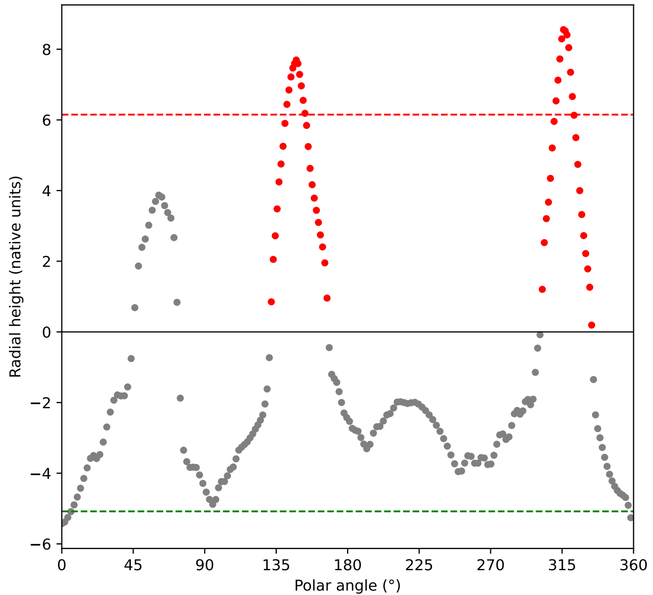

Topographical representation
Protrusions: 2
Intrusions: 0
40
20
0
−20
−40
−40
−20
0
20
40

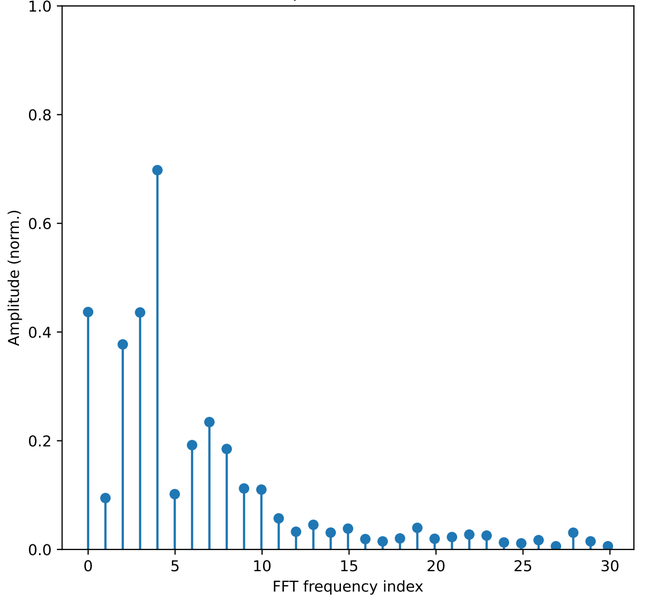

Topographical height
Radial height (native units)
Polar angle (°)
8
6
4
2
0
−2
−4
−6
0
45
90
135
180
225
270
315
360

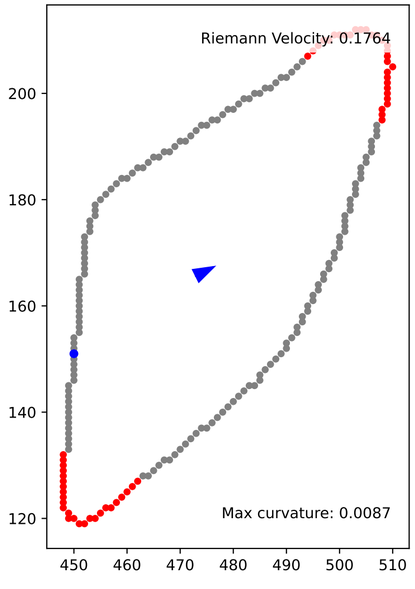

FFT spectrum (scatter)
Amplitude (norm.)
FFT frequency index
1.0
0.8
0.6
0.4
0.2
0.0
0
5
10
15
20
25
30

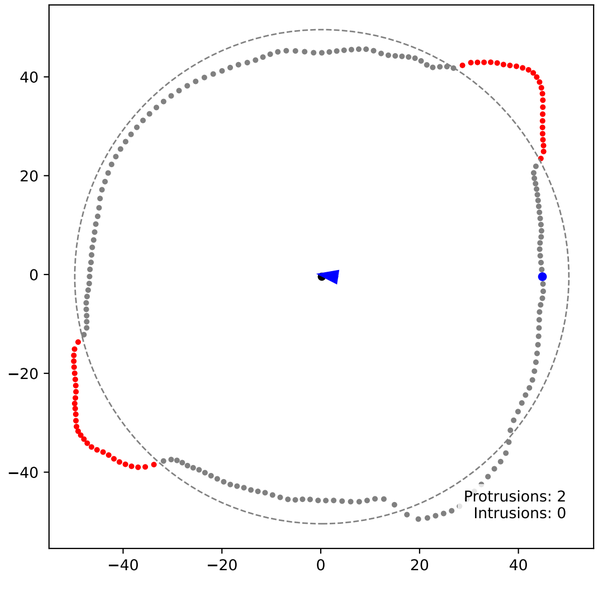

Shape evolution (t = 117.00)
Riemann Velocity: 0.1950
Max curvature: 0.0062
200
180
160
140
120
450
460
470
480
490
500
510

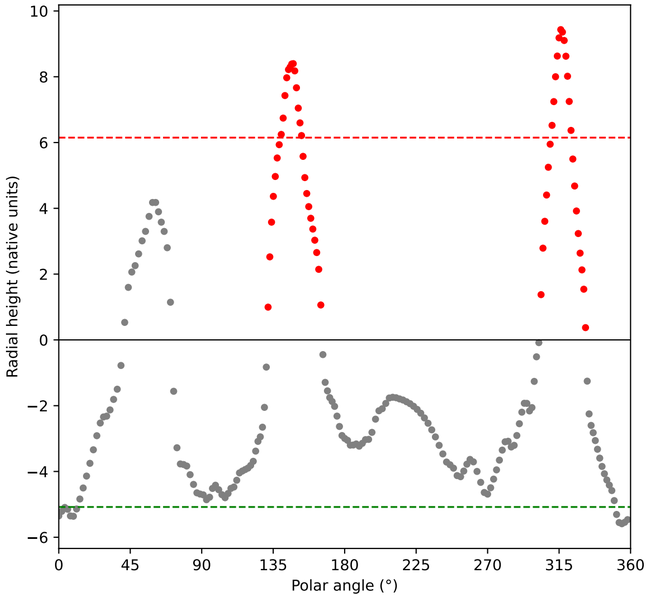

Topographical representation
Protrusions: 2
Intrusions: 0
40
20
0
−20
−40
−40
−20
0
20
40

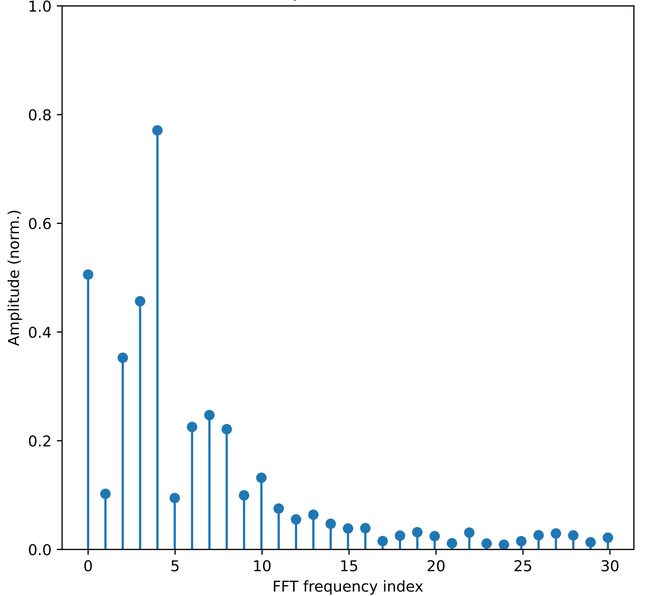

Topographical height
Radial height (native units)
Polar angle (°)
8
6
4
2
0
−2
−4
−6
0
45
90
135
180
225
270
315
360

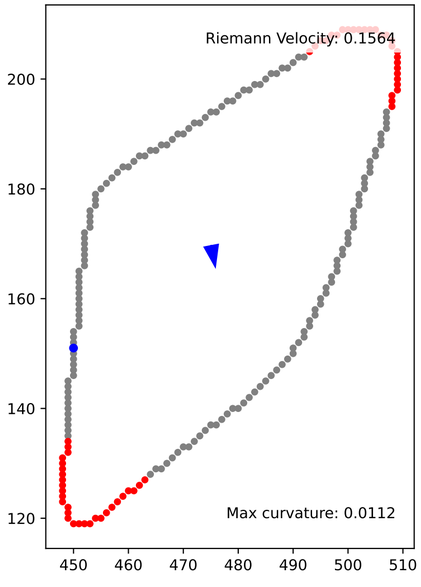

FFT spectrum (scatter)
Amplitude (norm.)
FFT frequency index
1.0
0.8
0.6
0.4
0.2
0.0
0
5
10
15
20
25
30

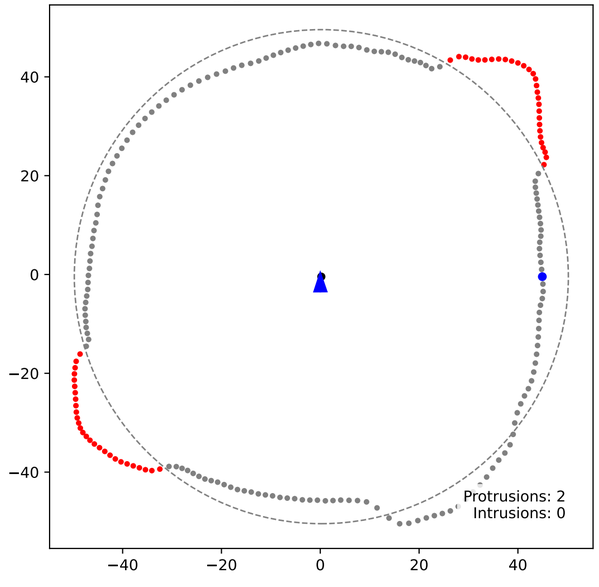

Shape evolution (t = 118.00)
Riemann Velocity: 0.1764
Max curvature: 0.0087
200
180
160
140
120
450
460
470
480
490
500
510

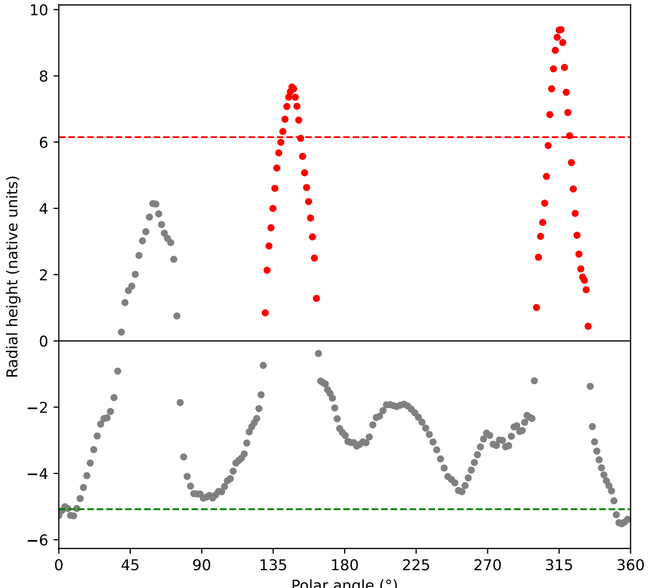

Topographical representation
Protrusions: 2
Intrusions: 0
40
20
0
−20
−40
−40
−20
0
20
40

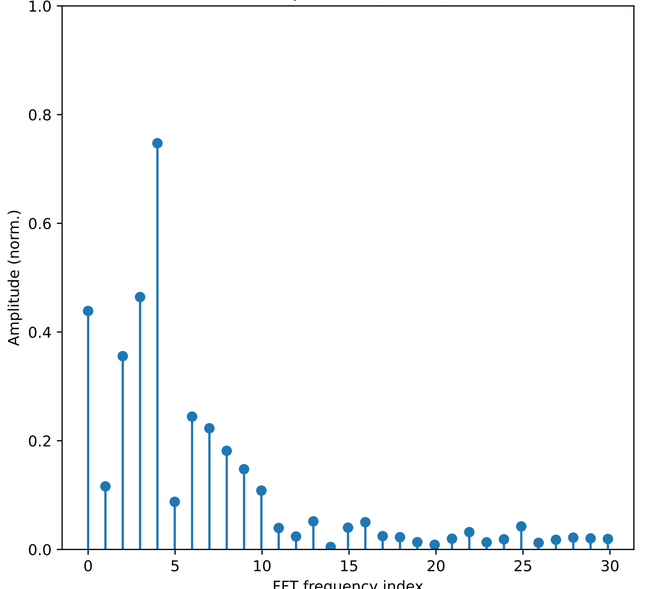

Topographical height
Radial height (native units)
Polar angle (°)
10
8
6
4
2
0
−2
−4
−6
0
45
90
135
180
225
270
315
360

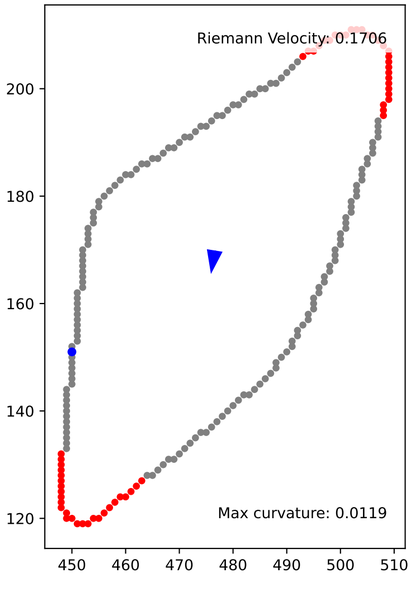

FFT spectrum (scatter)
Amplitude (norm.)
FFT frequency index
1.0
0.8
0.6
0.4
0.2
0.0
0
5
10
15
20
25
30

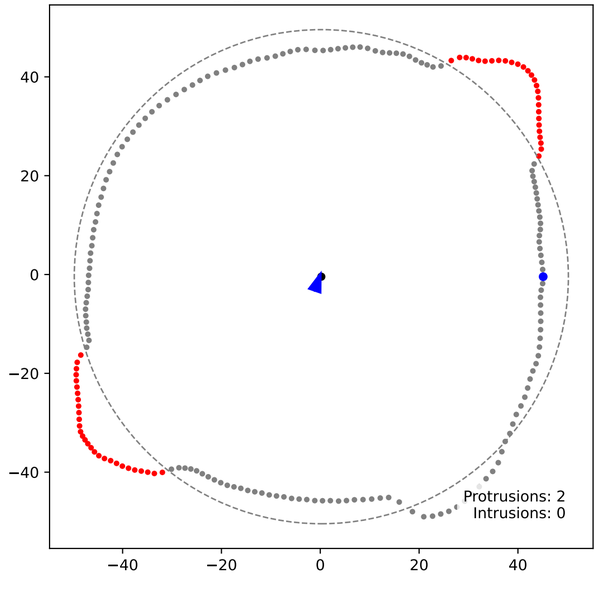

Shape evolution (t = 119.00)
Riemann Velocity: 0.1564
Max curvature: 0.0112
200
180
160
140
120
450
460
470
480
490
500
510

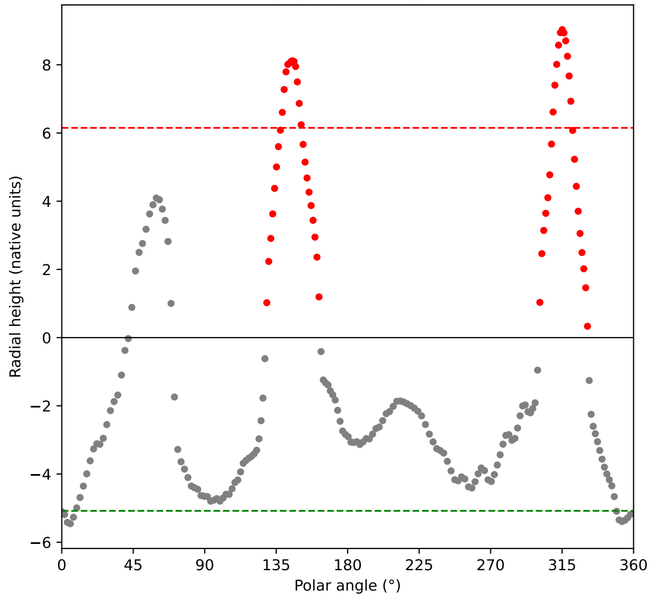

Topographical representation
Protrusions: 2
Intrusions: 0
40
20
0
−20
−40
−40
−20
0
20
40

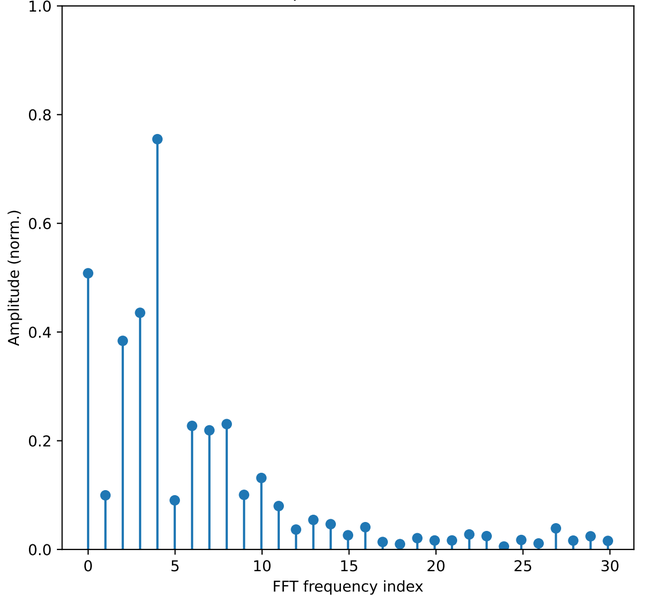

Topographical height
Radial height (native units)
Polar angle (°)
10
8
6
4
2
0
−2
−4
−6
0
45
90
135
180
225
270
315
360

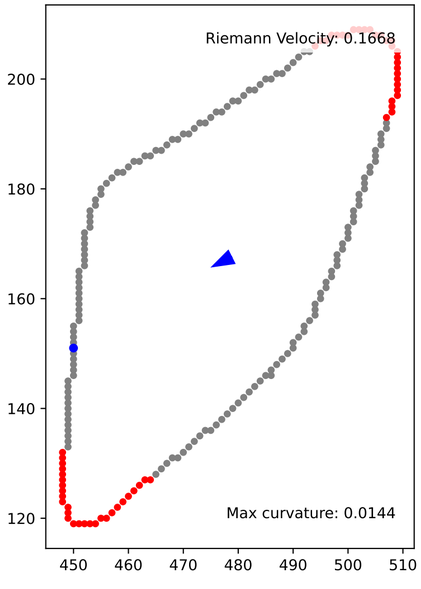

FFT spectrum (scatter)
Amplitude (norm.)
FFT frequency index
1.0
0.8
0.6
0.4
0.2
0.0
0
5
10
15
20
25
30

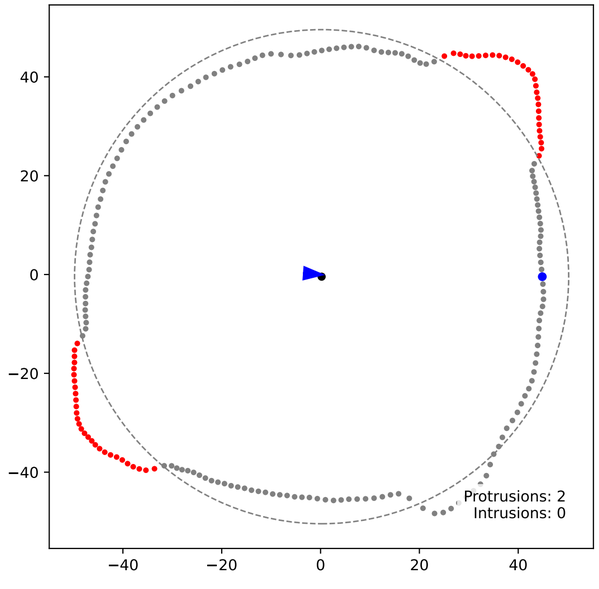

Shape evolution (t = 120.00)
Riemann Velocity: 0.1706
Max curvature: 0.0119
200
180
160
140
120
450
460
470
480
490
500
510

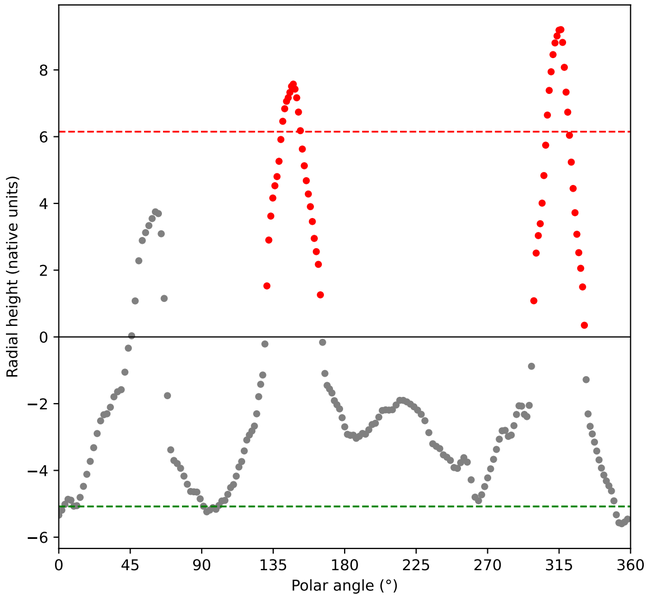

Topographical representation
Protrusions: 2
Intrusions: 0
40
20
0
−20
−40
−40
−20
0
20
40

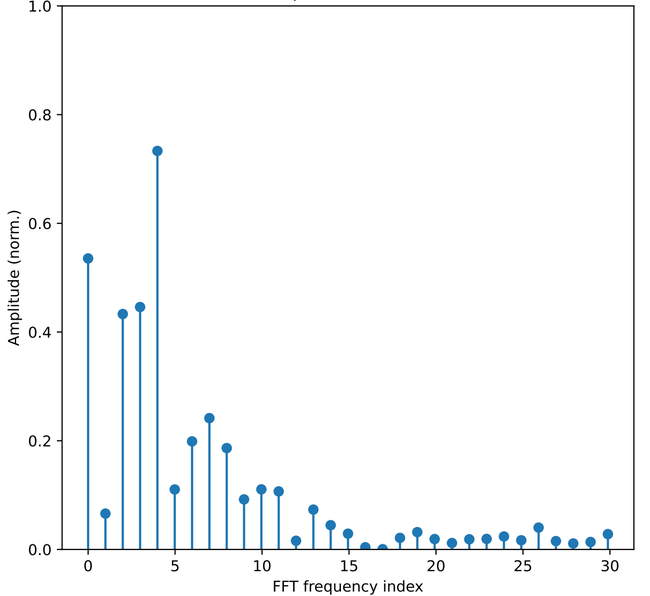

Topographical height
Radial height (native units)
Polar angle (°)
8
6
4
2
0
−2
−4
−6
0
45
90
135
180
225
270
315
360

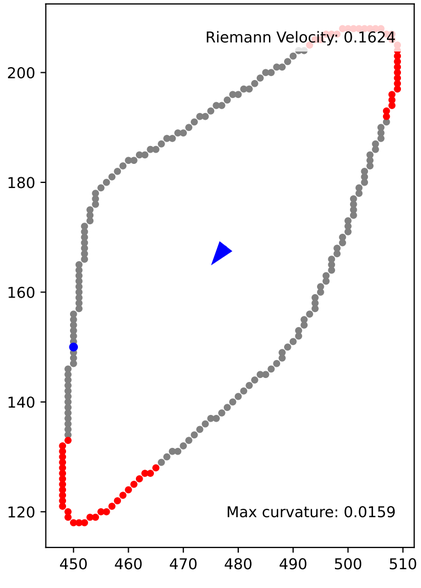

FFT spectrum (scatter)
Amplitude (norm.)
FFT frequency index
1.0
0.8
0.6
0.4
0.2
0.0
0
5
10
15
20
25
30

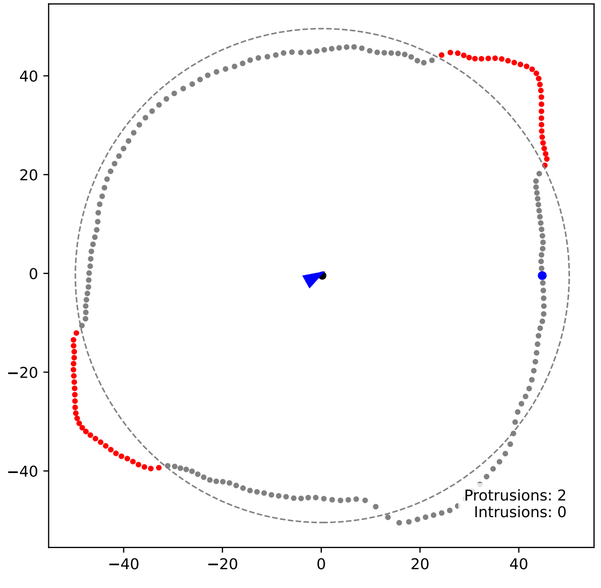

Shape evolution (t = 121.00)
Riemann Velocity: 0.1668
Max curvature: 0.0144
200
180
160
140
120
450
460
470
480
490
500
510

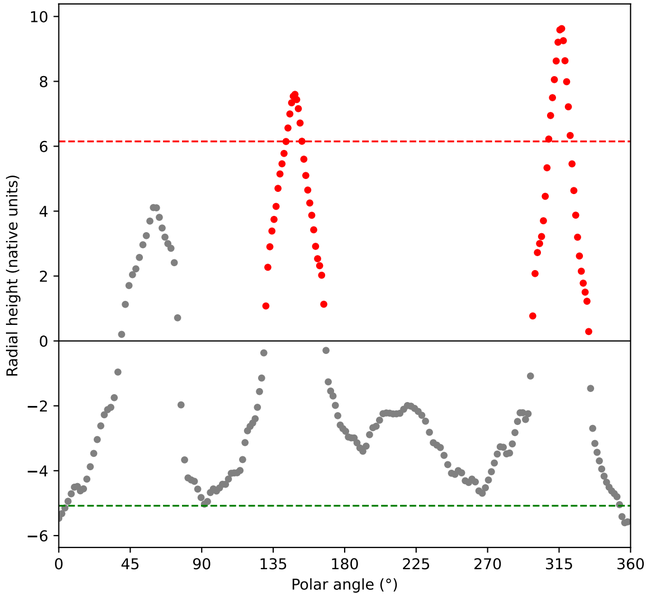

Topographical representation
Protrusions: 2
Intrusions: 0
40
20
0
−20
−40
−40
−20
0
20
40

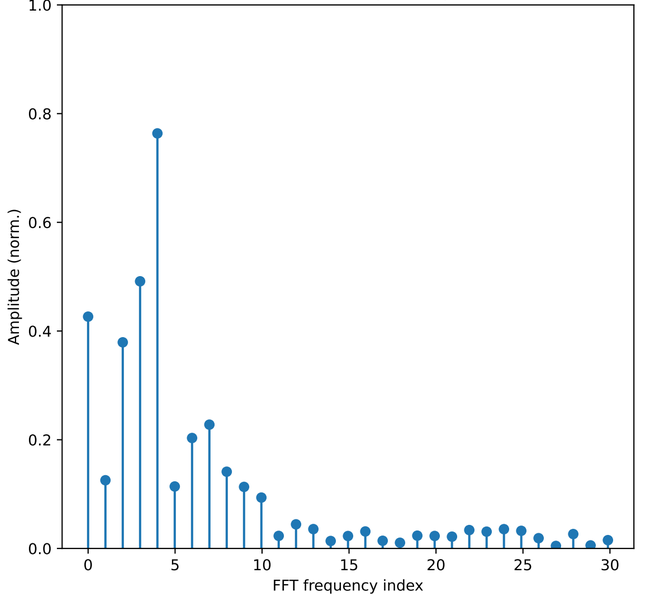

Topographical height
Radial height (native units)
Polar angle (°)
8
6
4
2
0
−2
−4
−6
0
45
90
135
180
225
270
315
360

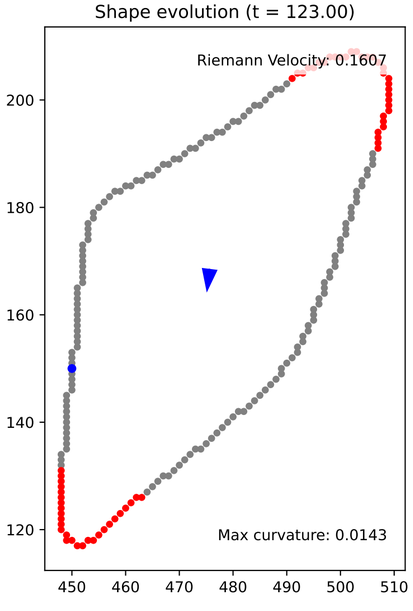

FFT spectrum (scatter)
Amplitude (norm.)
FFT frequency index
1.0
0.8
0.6
0.4
0.2
0.0
0
5
10
15
20
25
30

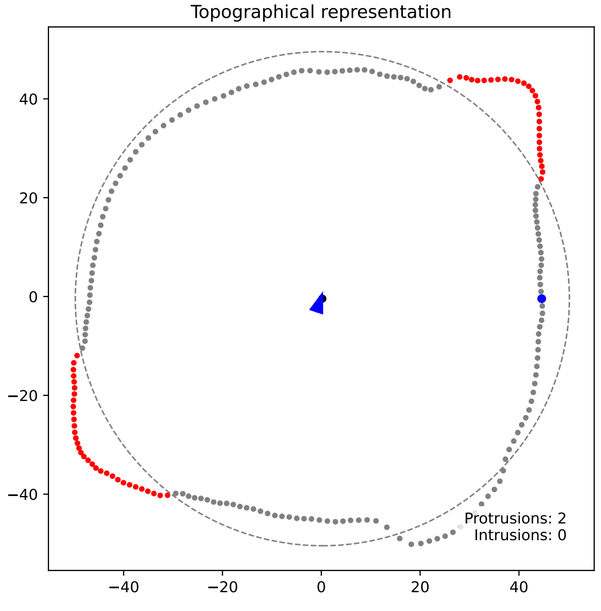

Shape evolution (t = 122.00)
Riemann Velocity: 0.1624
Max curvature: 0.0159
200
180
160
140
120
450
460
470
480
490
500
510

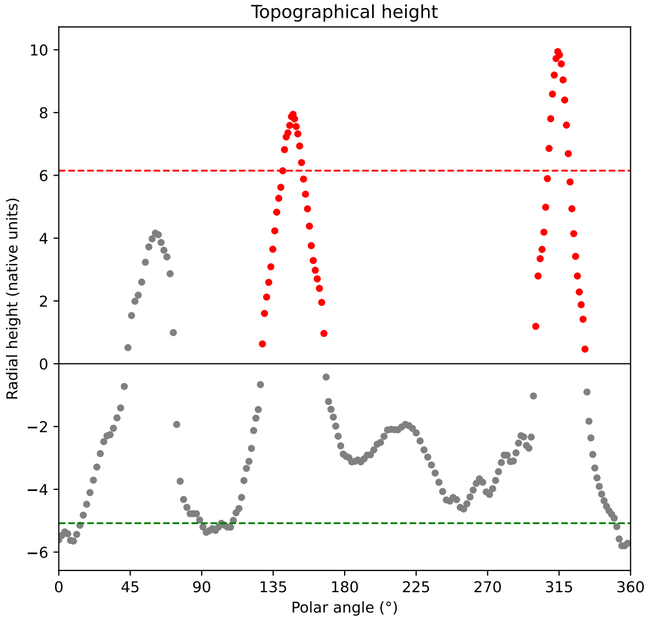

Topographical representation
Protrusions: 2
Intrusions: 0
40
20
0
−20
−40
−40
−20
0
20
40

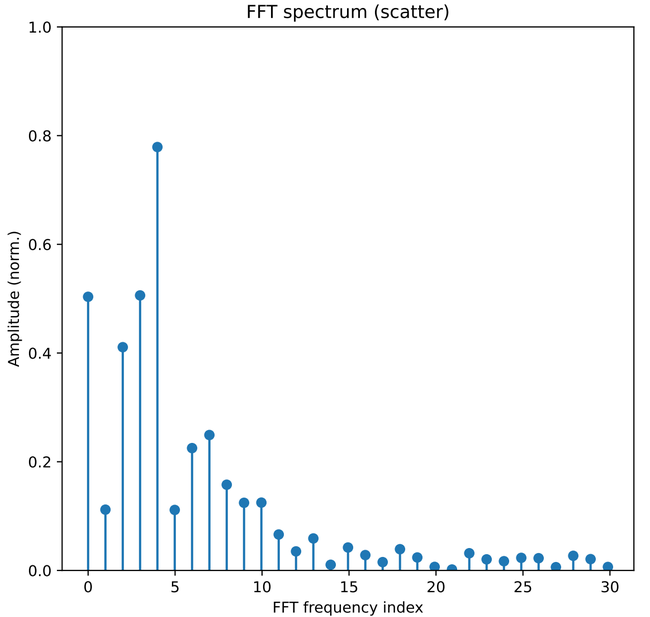

Topographical height
Radial height (native units)
Polar angle (°)
10
8
6
4
2
0
−2
−4
−6
0
45
90
135
180
225
270
315
360

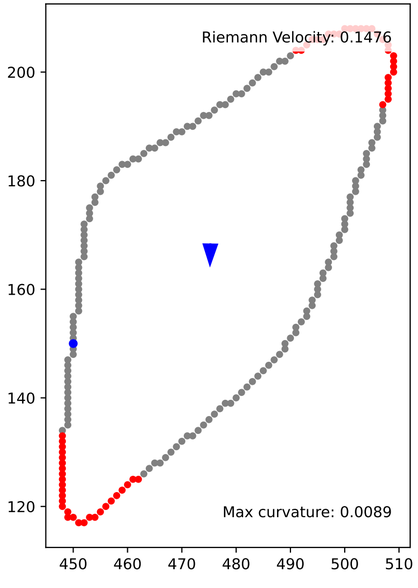

FFT spectrum (scatter)
Amplitude (norm.)
FFT frequency index
1.0
0.8
0.6
0.4
0.2
0.0
0
5
10
15
20
25
30

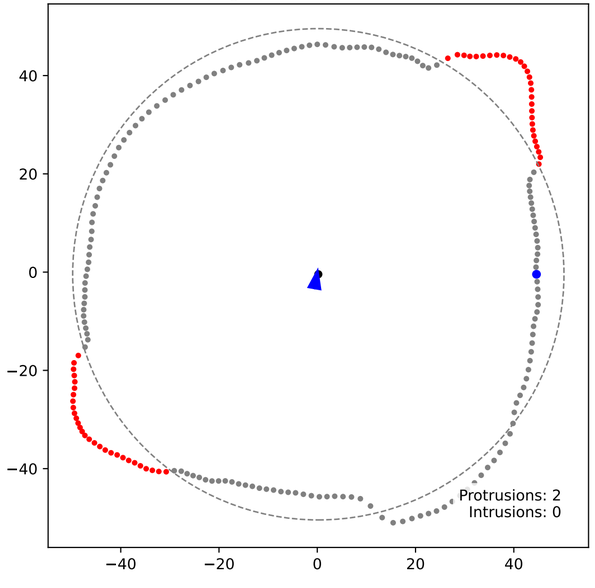

Shape evolution (t = 123.00)
Riemann Velocity: 0.1607
Max curvature: 0.0143
200
180
160
140
120
450
460
470
480
490
500
510

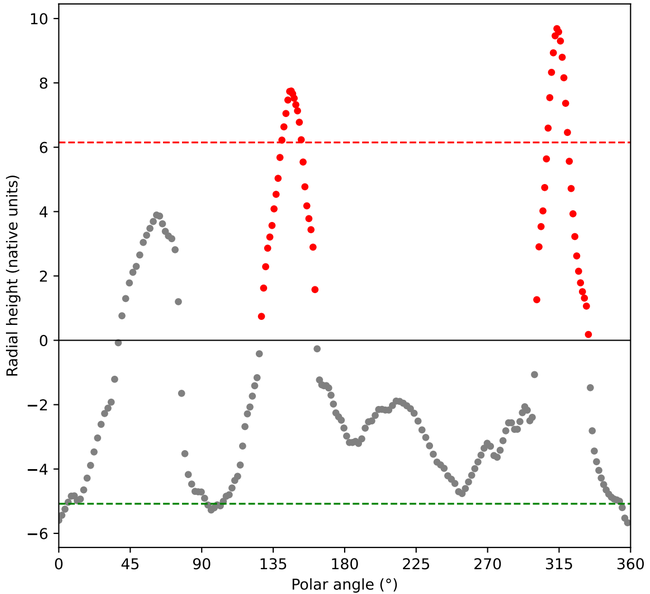

Topographical representation
Protrusions: 2
Intrusions: 0
40
20
0
−20
−40
−40
−20
0
20
40

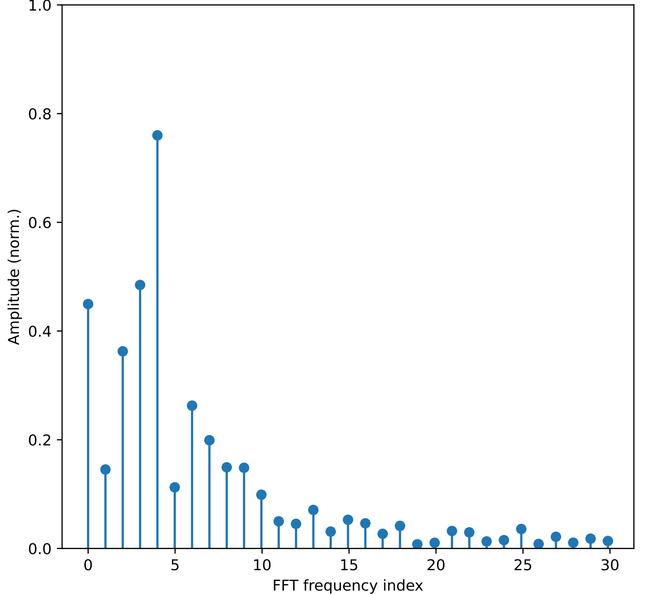

Topographical height
Radial height (native units)
Polar angle (°)
10
8
6
4
2
0
−2
−4
−6
0
45
90
135
180
225
270
315
360

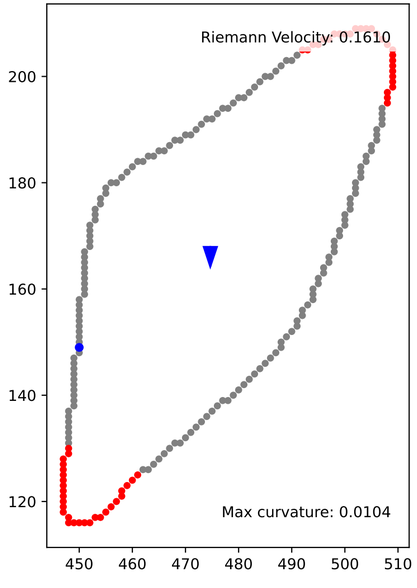

FFT spectrum (scatter)
Amplitude (norm.)
FFT frequency index
1.0
0.8
0.6
0.4
0.2
0.0
0
5
10
15
20
25
30

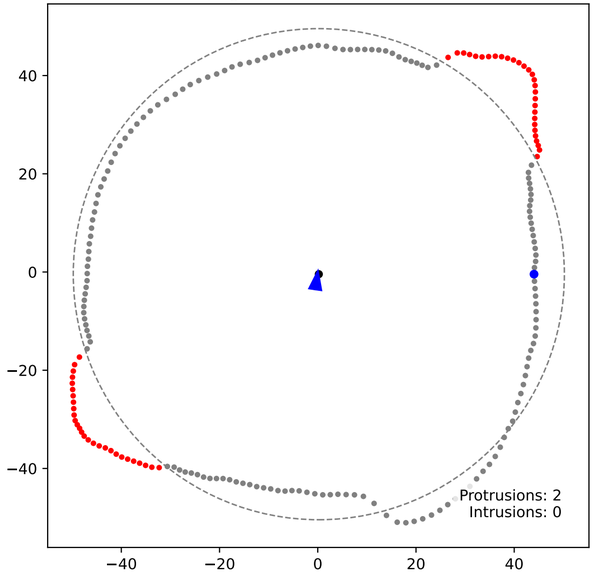

Shape evolution (t = 124.00)
Riemann Velocity: 0.1476
Max curvature: 0.0089
200
180
160
140
120
450
460
470
480
490
500
510

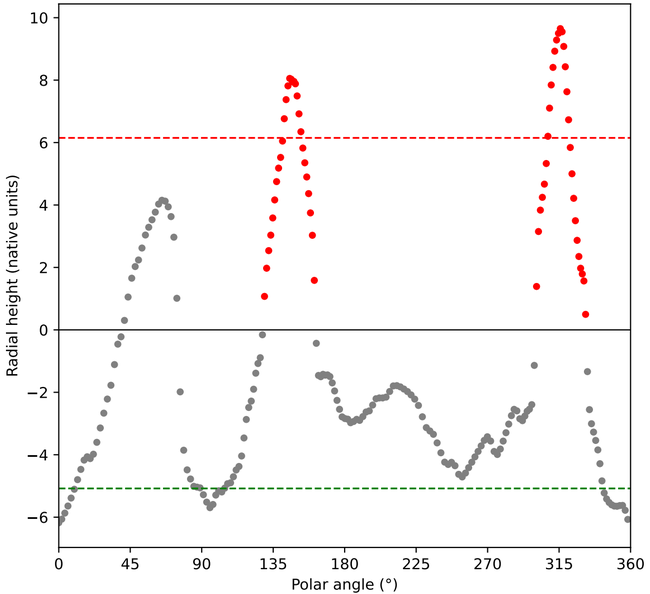

Topographical representation
Protrusions: 2
Intrusions: 0
40
20
0
−20
−40
−40
−20
0
20
40

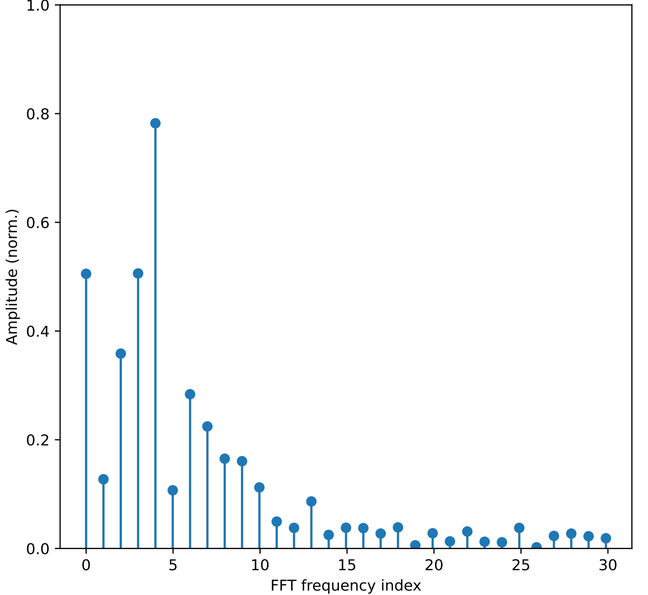

Topographical height
Radial height (native units)
Polar angle (°)
10
8
6
4
2
0
−2
−4
−6
0
45
90
135
180
225
270
315
360

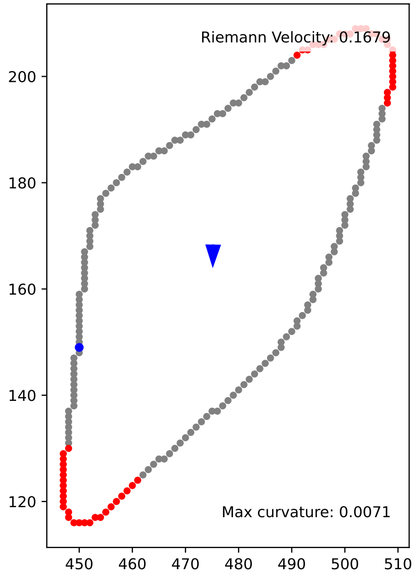

FFT spectrum (scatter)
Amplitude (norm.)
FFT frequency index
1.0
0.8
0.6
0.4
0.2
0.0
0
5
10
15
20
25
30

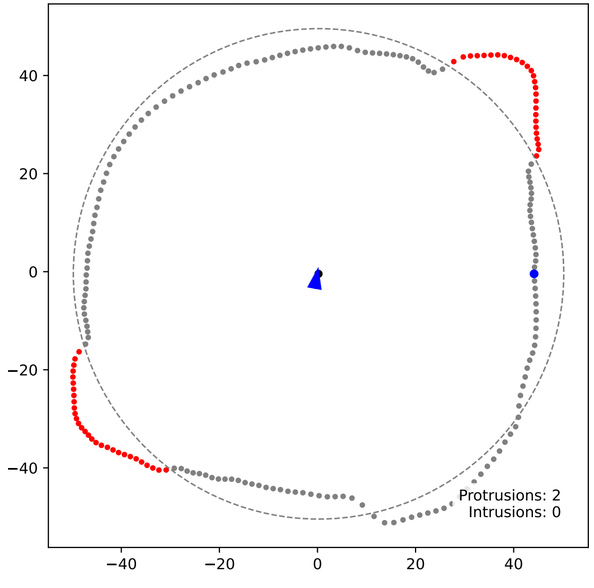

Shape evolution (t = 125.00)
Riemann Velocity: 0.1610
Max curvature: 0.0104
200
180
160
140
120
450
460
470
480
490
500
510

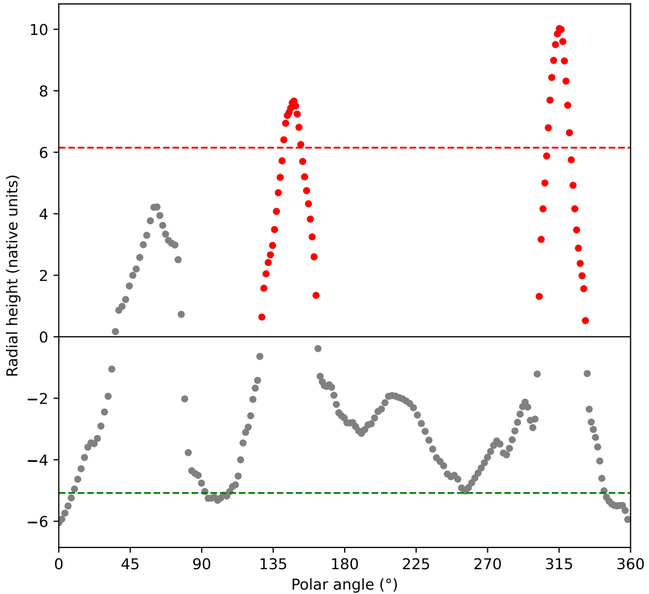

Topographical representation
Protrusions: 2
Intrusions: 0
40
20
0
−20
−40
−40
−20
0
20
40

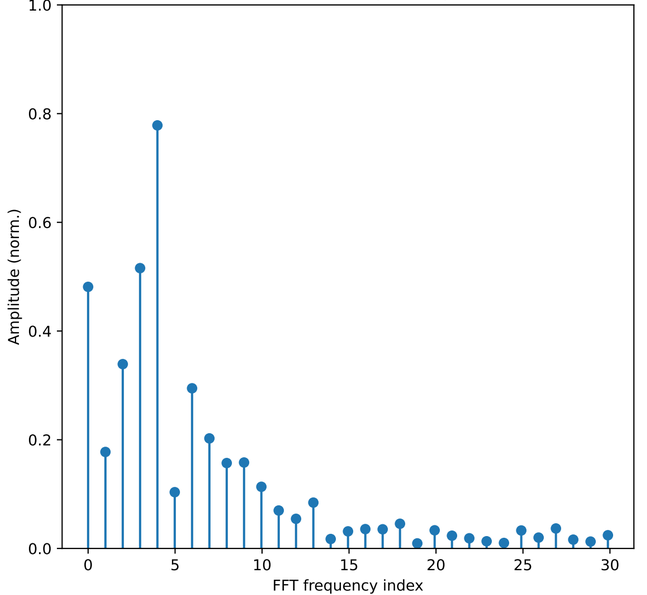

Topographical height
Radial height (native units)
Polar angle (°)
10
8
6
4
2
0
−2
−4
−6
0
45
90
135
180
225
270
315
360

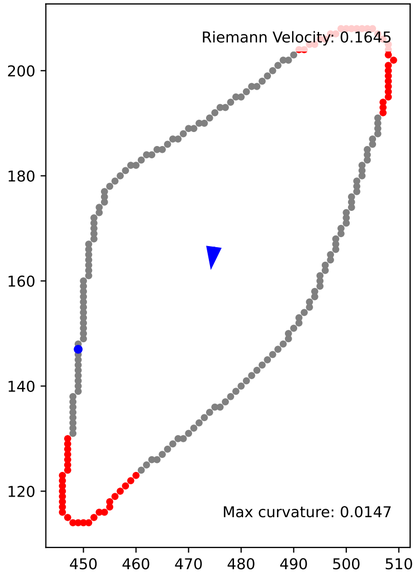

FFT spectrum (scatter)
Amplitude (norm.)
FFT frequency index
1.0
0.8
0.6
0.4
0.2
0.0
0
5
10
15
20
25
30

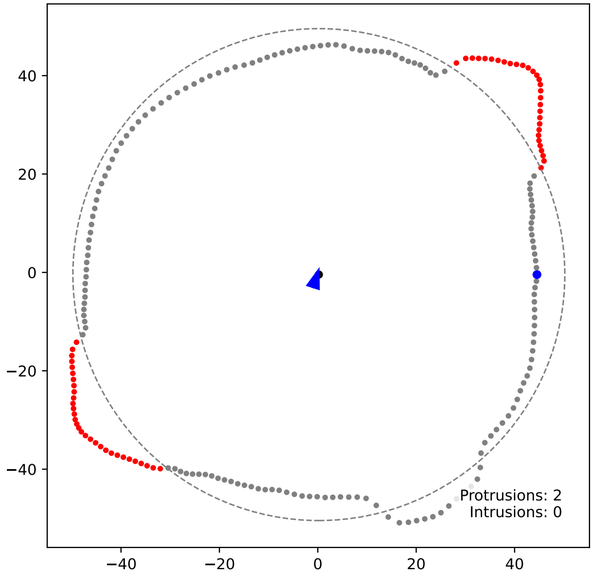

Shape evolution (t = 126.00)
Riemann Velocity: 0.1679
Max curvature: 0.0071
200
180
160
140
120
450
460
470
480
490
500
510

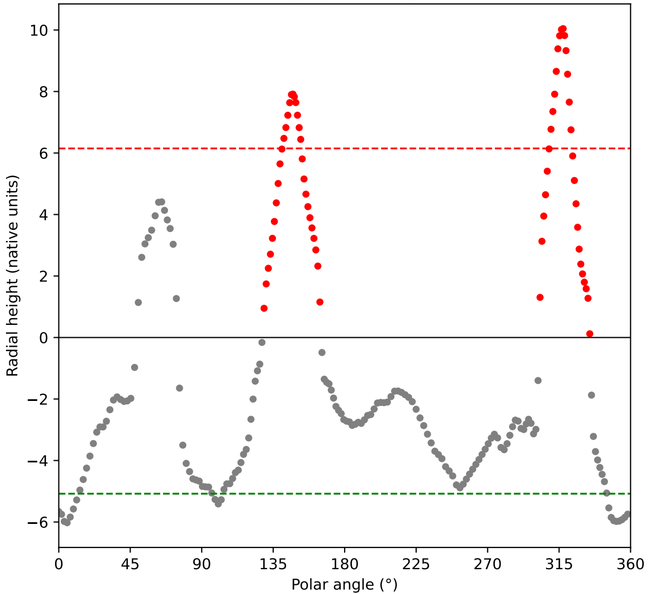

Topographical representation
Protrusions: 2
Intrusions: 0
40
20
0
−20
−40
−40
−20
0
20
40

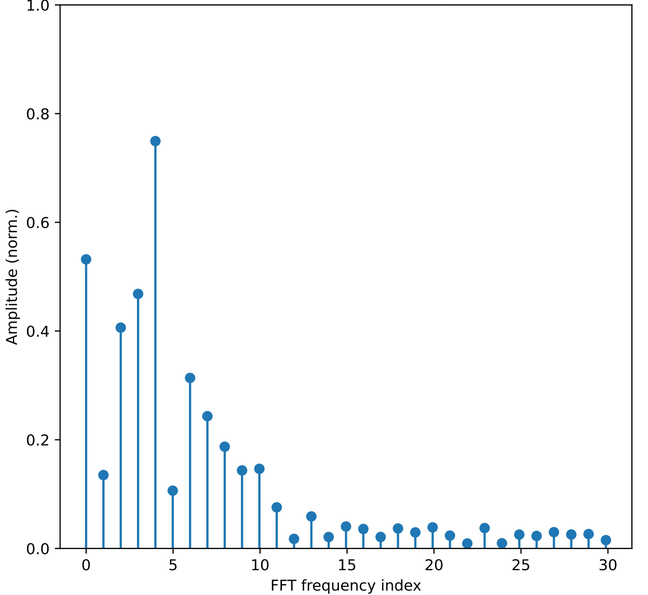

Topographical height
Radial height (native units)
Polar angle (°)
10
8
6
4
2
0
−2
−4
−6
0
45
90
135
180
225
270
315
360

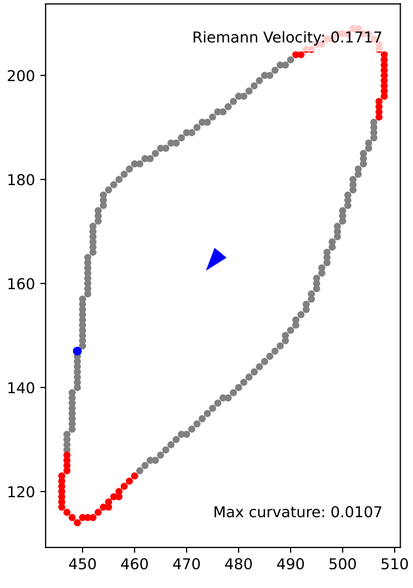

FFT spectrum (scatter)
Amplitude (norm.)
FFT frequency index
1.0
0.8
0.6
0.4
0.2
0.0
0
5
10
15
20
25
30

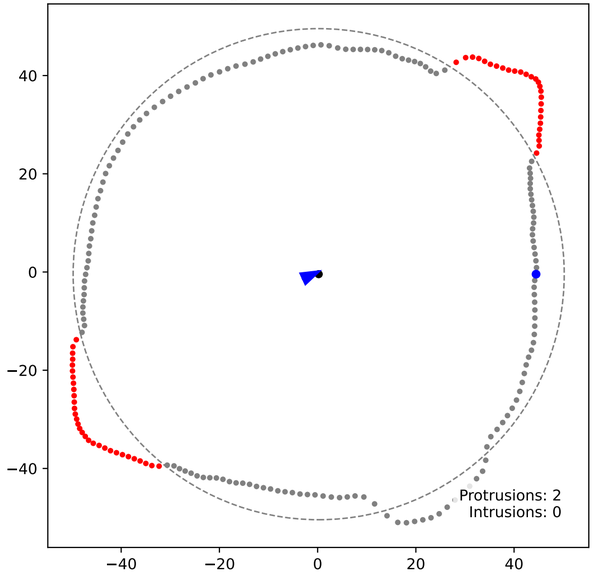

Shape evolution (t = 127.00)
Riemann Velocity: 0.1645
Max curvature: 0.0147
200
180
160
140
120
450
460
470
480
490
500
510

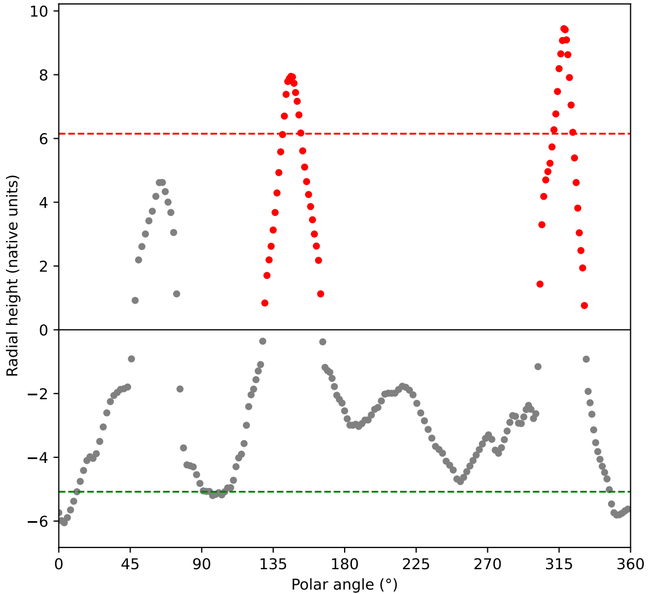

Topographical representation
Protrusions: 2
Intrusions: 0
40
20
0
−20
−40
−40
−20
0
20
40

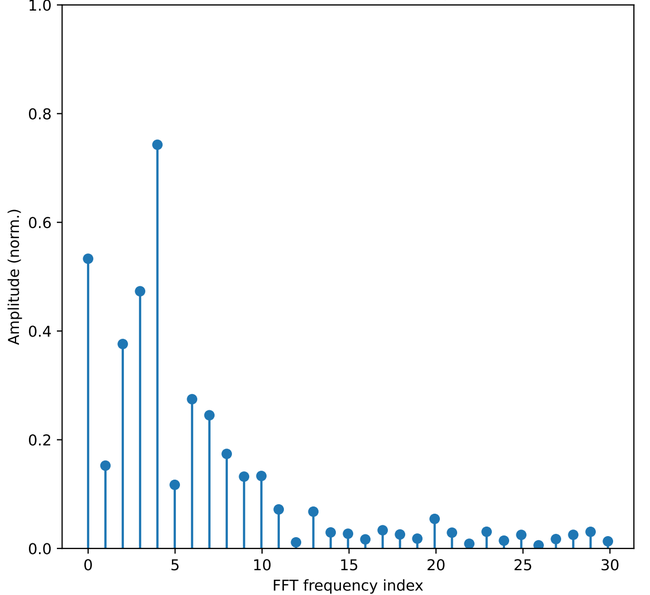

Topographical height
Radial height (native units)
Polar angle (°)
10
8
6
4
2
0
−2
−4
−6
0
45
90
135
180
225
270
315
360

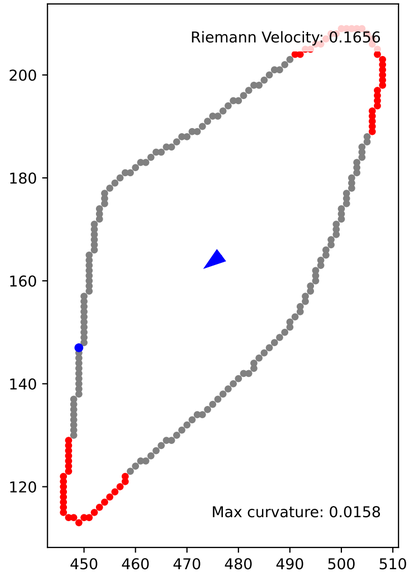

FFT spectrum (scatter)
Amplitude (norm.)
FFT frequency index
1.0
0.8
0.6
0.4
0.2
0.0
0
5
10
15
20
25
30

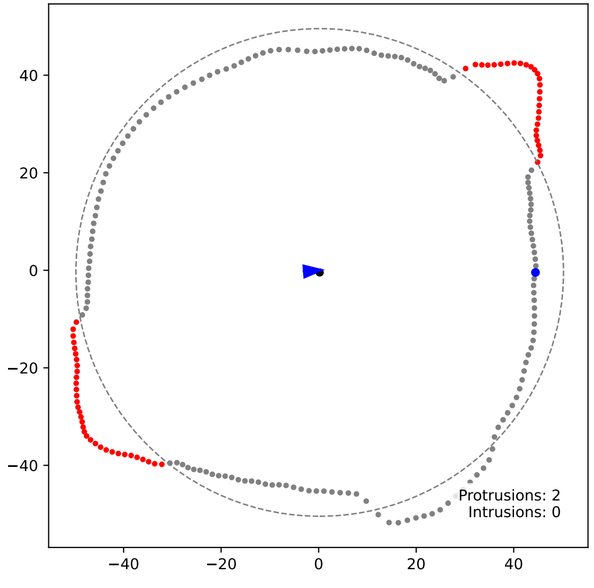

Shape evolution (t = 128.00)
Riemann Velocity: 0.1717
Max curvature: 0.0107
200
180
160
140
120
450
460
470
480
490
500
510

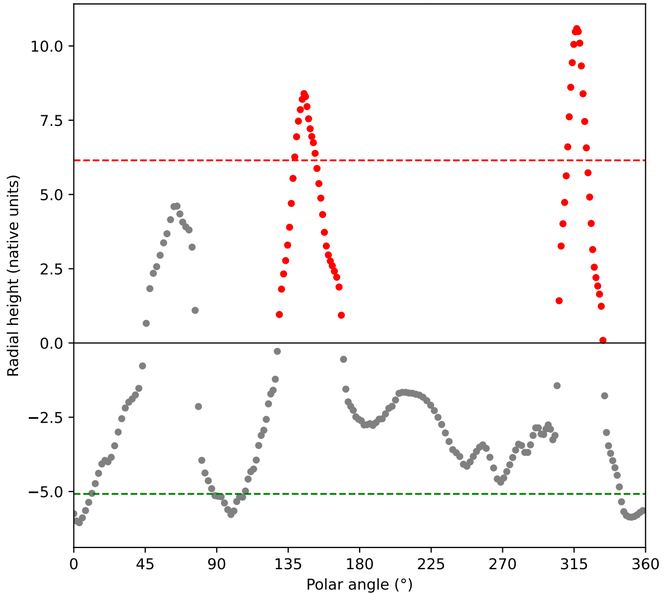

Topographical representation
Protrusions: 2
Intrusions: 0
40
20
0
−20
−40
−40
−20
0
20
40

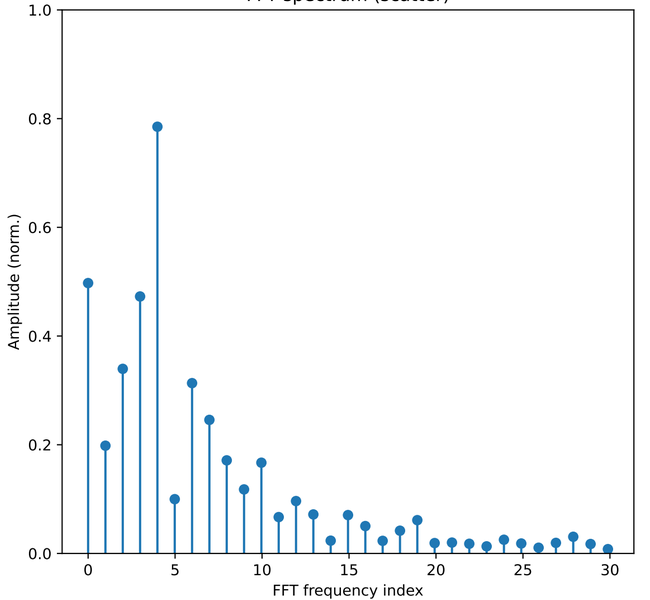

Topographical height
Radial height (native units)
Polar angle (°)
10
8
6
4
2
0
−2
−4
−6
0
45
90
135
180
225
270
315
360

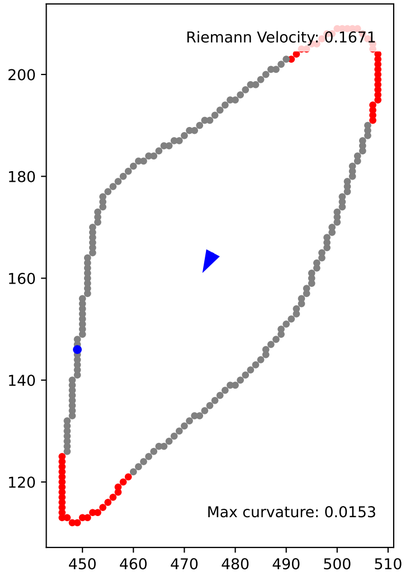

FFT spectrum (scatter)
Amplitude (norm.)
FFT frequency index
1.0
0.8
0.6
0.4
0.2
0.0
0
5
10
15
20
25
30

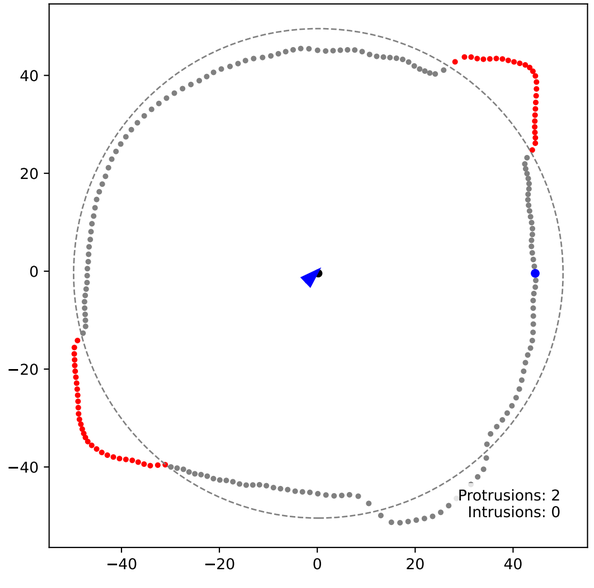

Shape evolution (t = 129.00)
Riemann Velocity: 0.1656
Max curvature: 0.0158
200
180
160
140
120
450
460
470
480
490
500
510

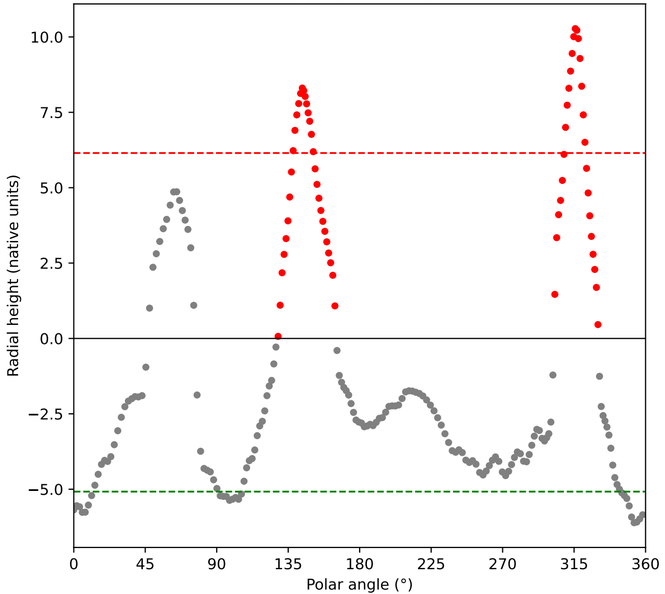

Topographical representation
Protrusions: 2
Intrusions: 0
40
20
0
−20
−40
−40
−20
0
20
40

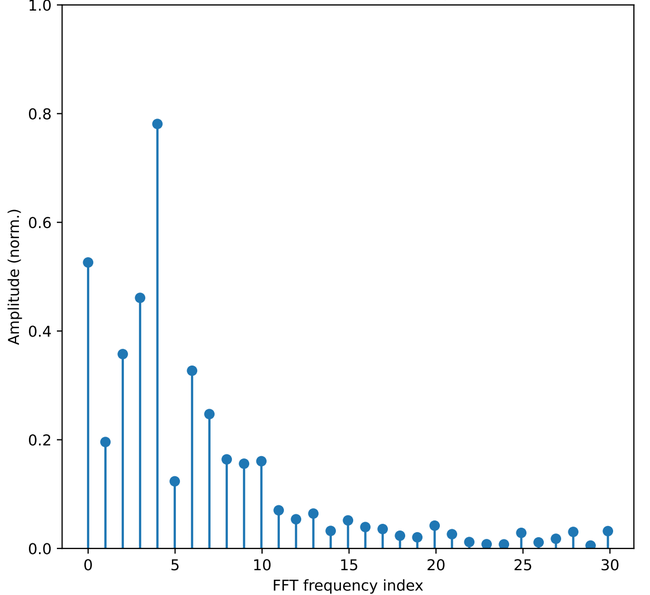

Topographical height
Radial height (native units)
Polar angle (°)
10.0
7.5
5.0
2.5
0.0
−2.5
−5.0
0
45
90
135
180
225
270
315
360

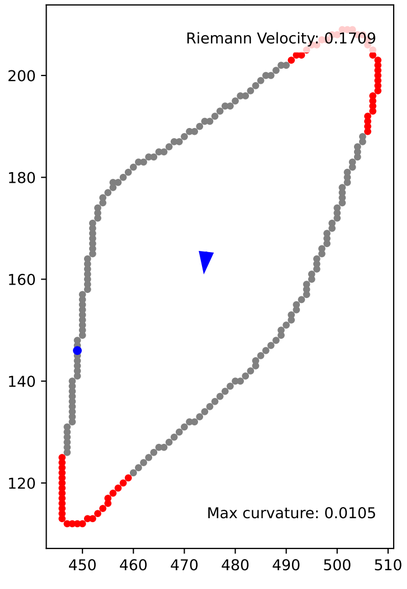

FFT spectrum (scatter)
Amplitude (norm.)
FFT frequency index
1.0
0.8
0.6
0.4
0.2
0.0
0
5
10
15
20
25
30

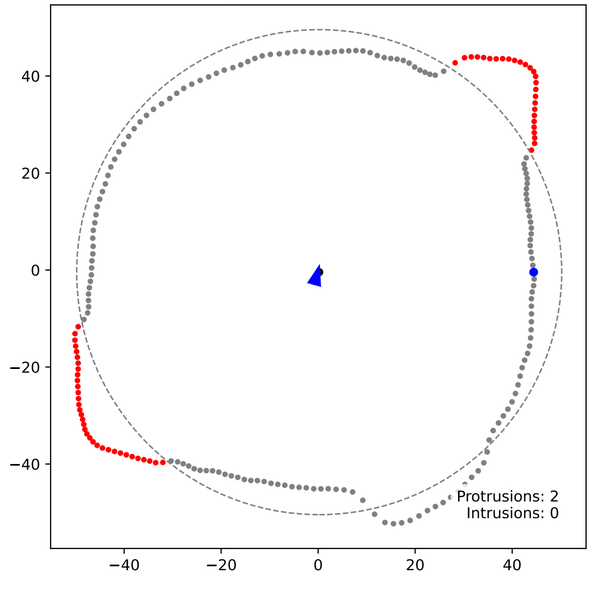

Shape evolution (t = 130.00)
Riemann Velocity: 0.1671
Max curvature: 0.0153
200
180
160
140
120
450
460
470
480
490
500
510

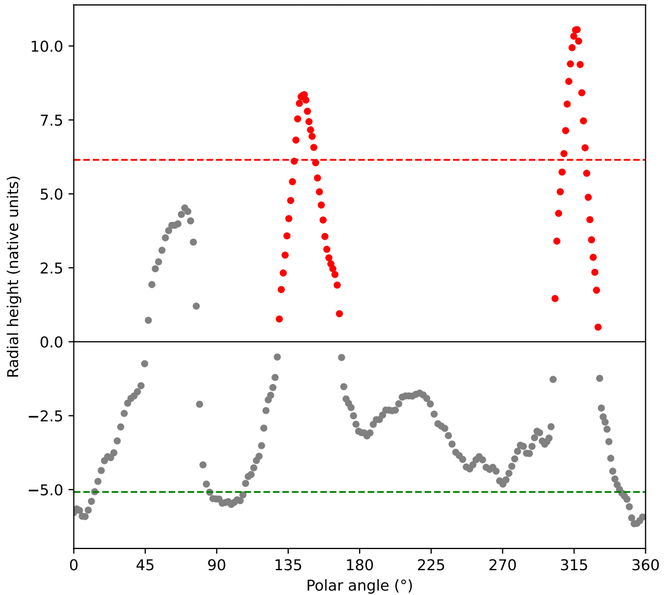

Topographical representation
Protrusions: 2
Intrusions: 0
40
20
0
−20
−40
−40
−20
0
20
40

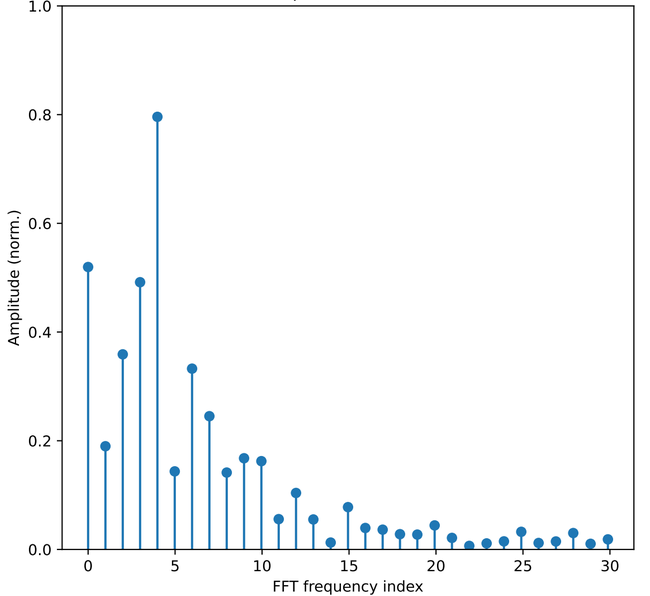

Topographical height
Radial height (native units)
Polar angle (°)
10.0
7.5
5.0
2.5
0.0
−2.5
−5.0
0
45
90
135
180
225
270
315
360

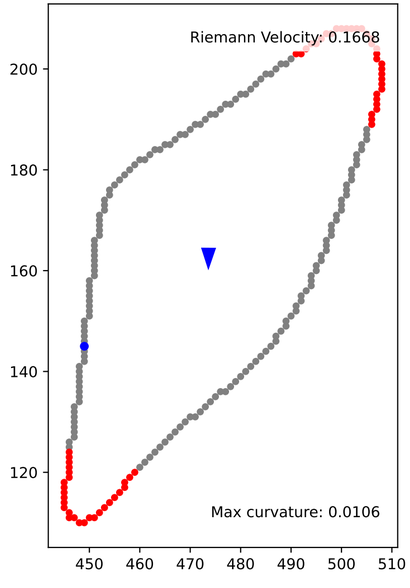

FFT spectrum (scatter)
Amplitude (norm.)
FFT frequency index
1.0
0.8
0.6
0.4
0.2
0.0
0
5
10
15
20
25
30

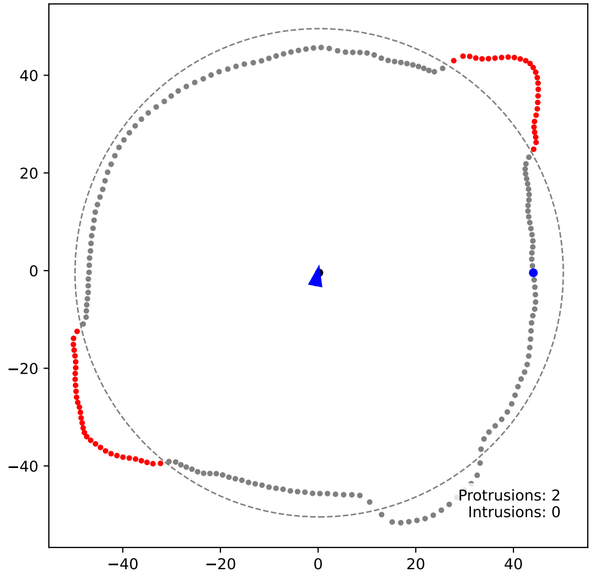

Shape evolution (t = 131.00)
Riemann Velocity: 0.1709
Max curvature: 0.0105
200
180
160
140
120
450
460
470
480
490
500
510

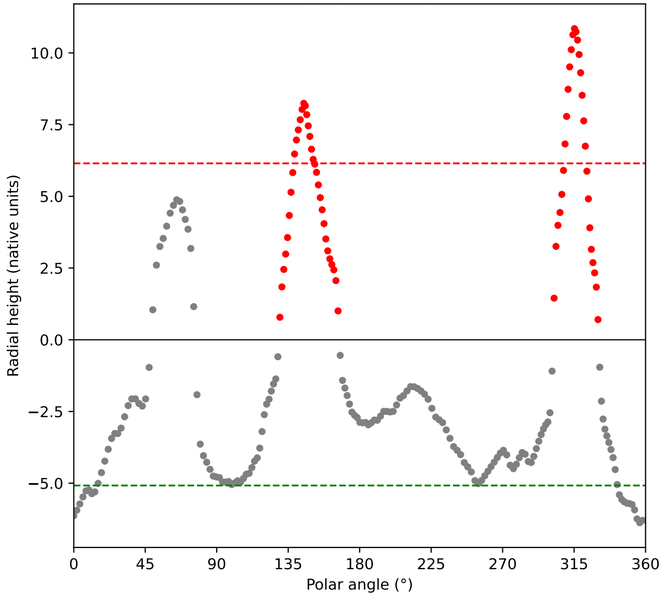

Topographical representation
Protrusions: 2
Intrusions: 0
40
20
0
−20
−40
−40
−20
0
20
40

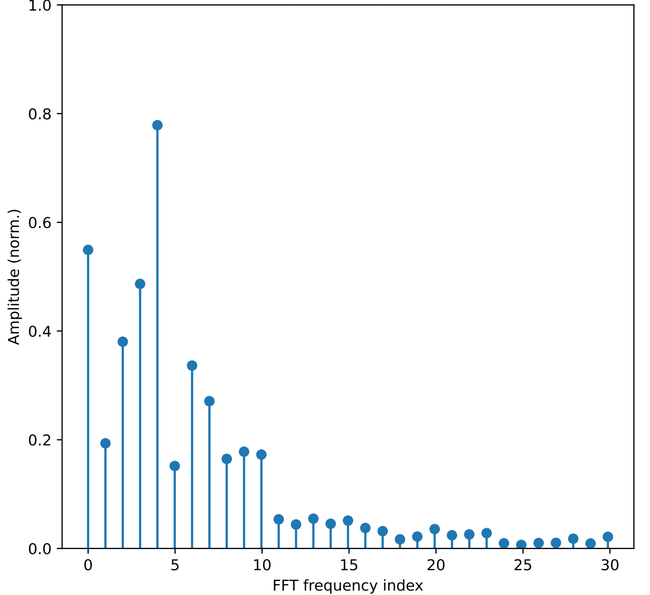

Topographical height
Radial height (native units)
Polar angle (°)
10.0
7.5
5.0
2.5
0.0
−2.5
−5.0
0
45
90
135
180
225
270
315
360

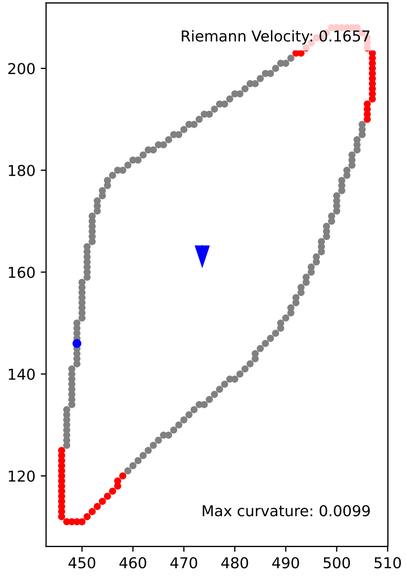

FFT spectrum (scatter)
Amplitude (norm.)
FFT frequency index
1.0
0.8
0.6
0.4
0.2
0.0
0
5
10
15
20
25
30

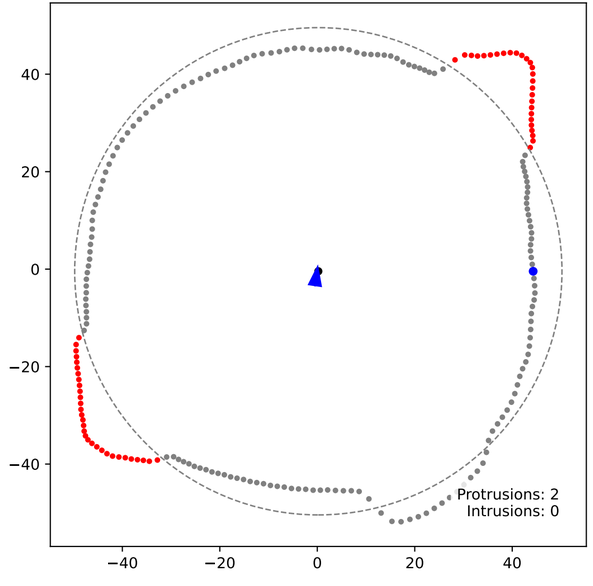

Shape evolution (t = 132.00)
Riemann Velocity: 0.1668
Max curvature: 0.0106
200
180
160
140
120
450
460
470
480
490
500
510

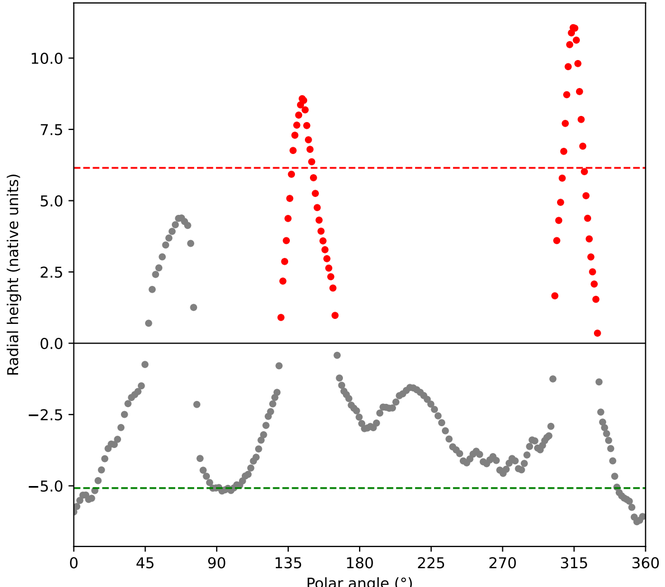

Topographical representation
Protrusions: 2
Intrusions: 0
40
20
0
−20
−40
−40
−20
0
20
40

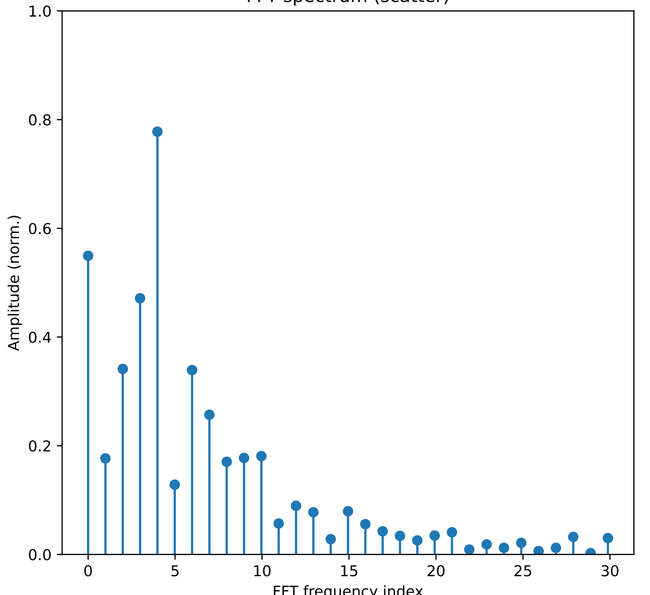

Topographical height
Radial height (native units)
Polar angle (°)
10.0
7.5
5.0
2.5
0.0
−2.5
−5.0
0
45
90
135
180
225
270
315
360

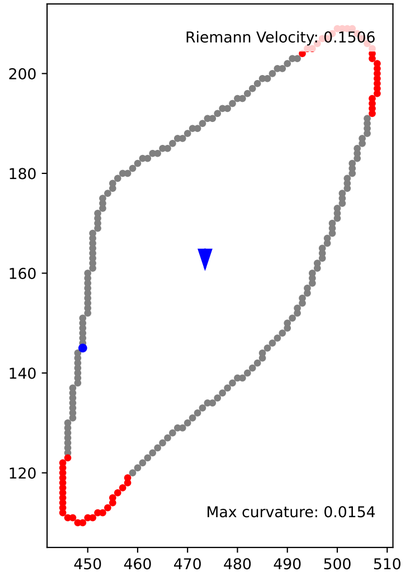

FFT spectrum (scatter)
Amplitude (norm.)
FFT frequency index
1.0
0.8
0.6
0.4
0.2
0.0
0
5
10
15
20
25
30

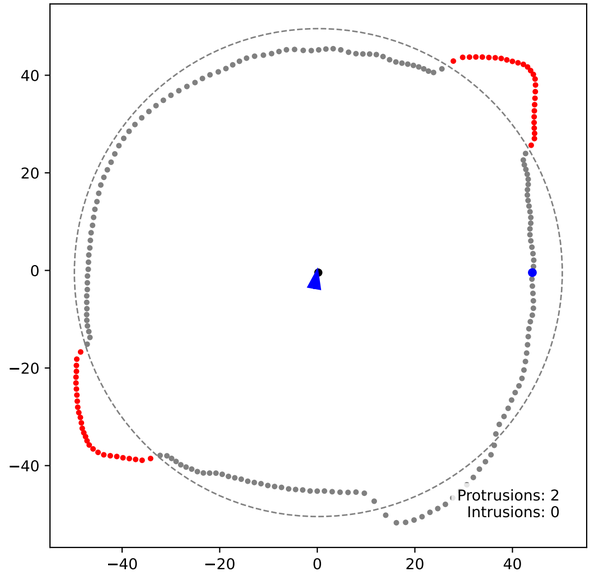

Shape evolution (t = 133.00)
Riemann Velocity: 0.1657
Max curvature: 0.0099
200
180
160
140
120
450
460
470
480
490
500
510

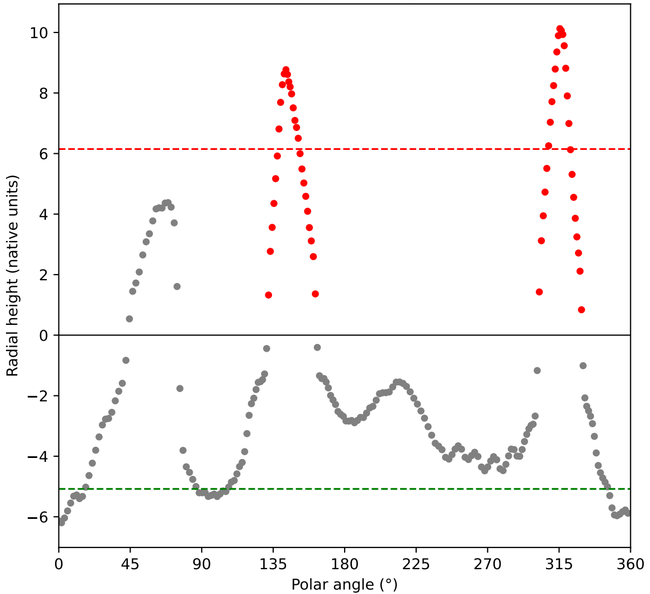

Topographical representation
Protrusions: 2
Intrusions: 0
40
20
0
−20
−40
−40
−20
0
20
40

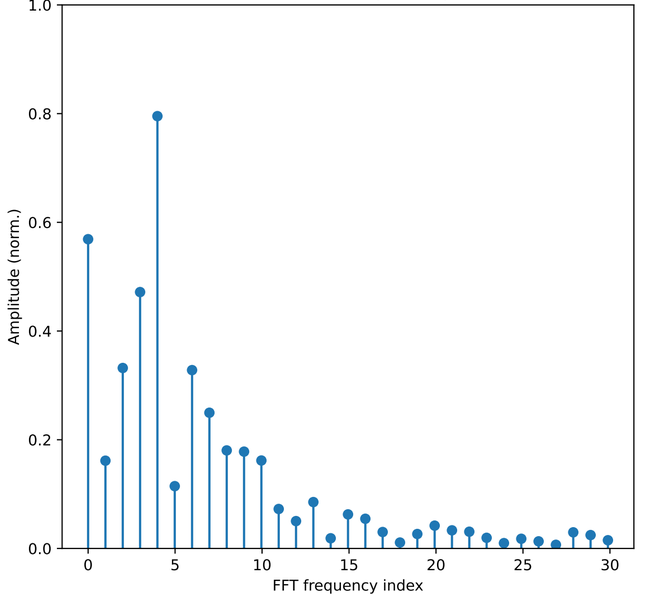

Topographical height
Radial height (native units)
Polar angle (°)
10.0
7.5
5.0
2.5
0.0
−2.5
−5.0
0
45
90
135
180
225
270
315
360

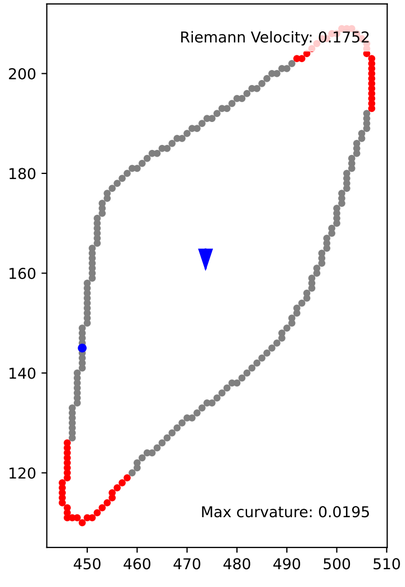

FFT spectrum (scatter)
Amplitude (norm.)
FFT frequency index
1.0
0.8
0.6
0.4
0.2
0.0
0
5
10
15
20
25
30

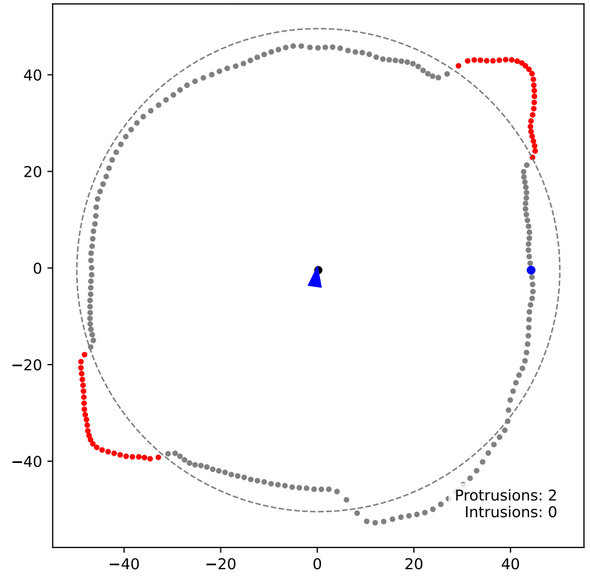

Shape evolution (t = 134.00)
Riemann Velocity: 0.1506
Max curvature: 0.0154
200
180
160
140
120
450
460
470
480
490
500
510

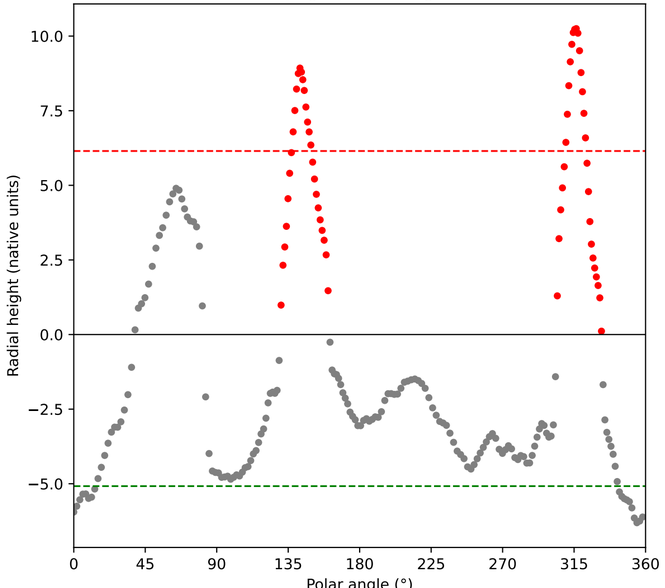

Topographical representation
Protrusions: 2
Intrusions: 0
40
20
0
−20
−40
−40
−20
0
20
40

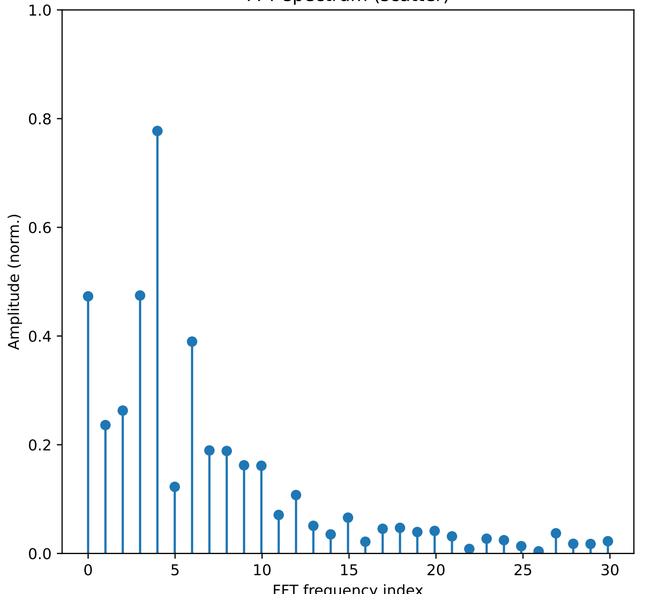

Topographical height
Radial height (native units)
Polar angle (°)
10
8
6
4
2
0
−2
−4
−6
0
45
90
135
180
225
270
315
360

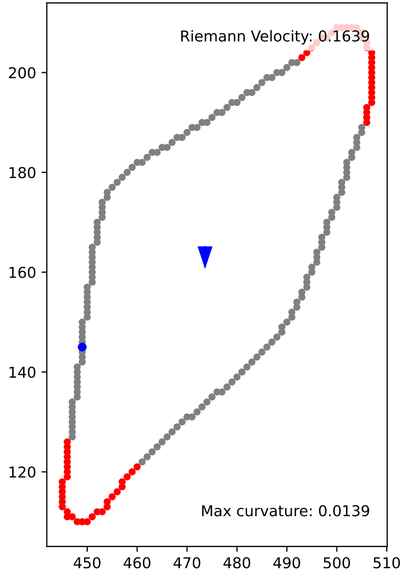

FFT spectrum (scatter)
Amplitude (norm.)
FFT frequency index
1.0
0.8
0.6
0.4
0.2
0.0
0
5
10
15
20
25
30

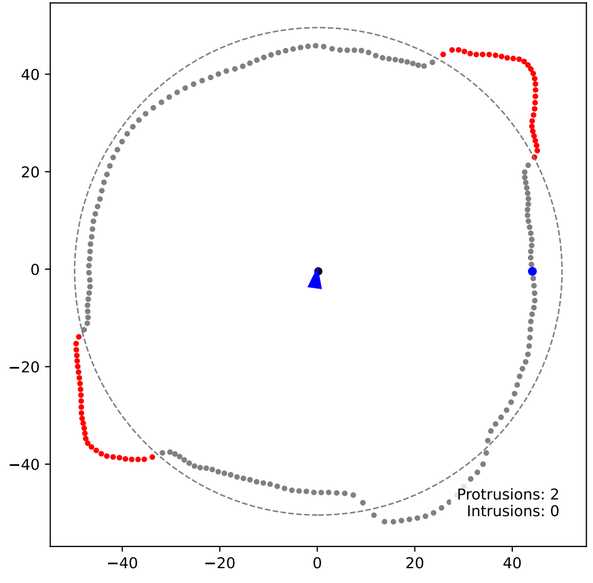

Shape evolution (t = 135.00)
Riemann Velocity: 0.1752
Max curvature: 0.0195
200
180
160
140
120
450
460
470
480
490
500
510

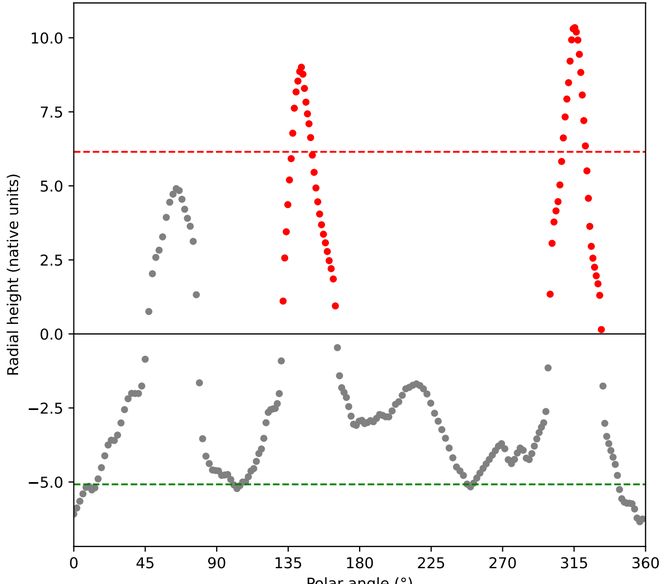

Topographical representation
Protrusions: 2
Intrusions: 0
40
20
0
−20
−40
−40
−20
0
20
40

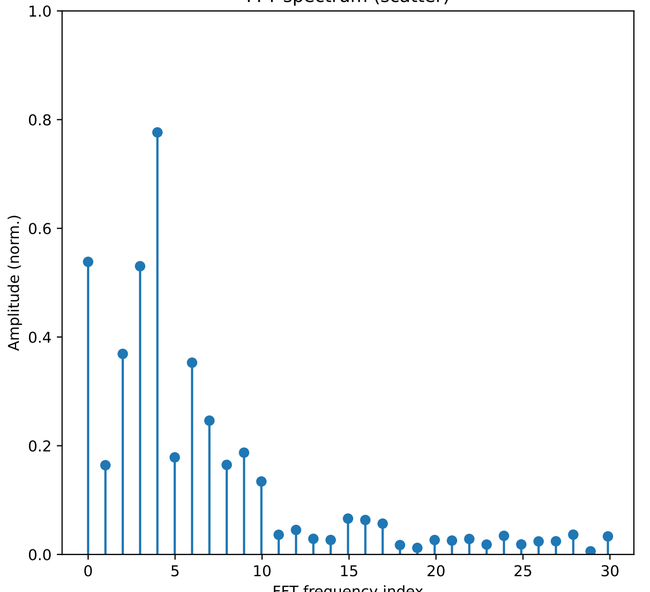

Topographical height
Radial height (native units)
Polar angle (°)
10.0
7.5
5.0
2.5
0.0
−2.5
−5.0
0
45
90
135
180
225
270
315
360

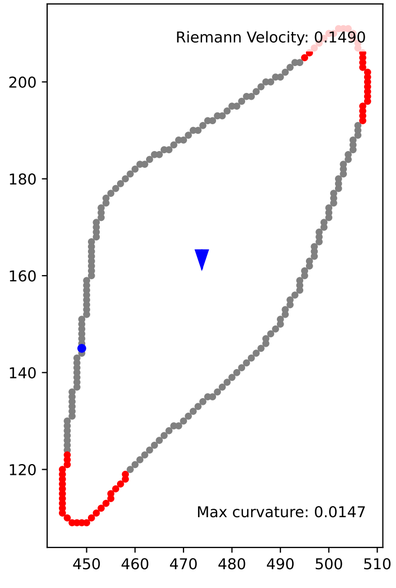

FFT spectrum (scatter)
Amplitude (norm.)
FFT frequency index
1.0
0.8
0.6
0.4
0.2
0.0
0
5
10
15
20
25
30

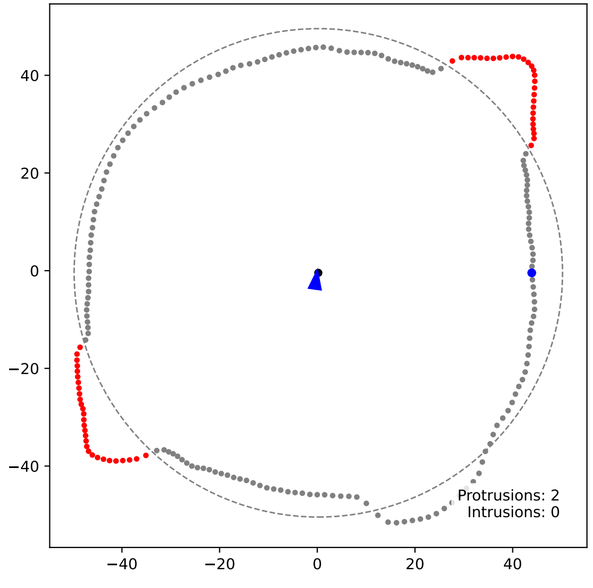

Shape evolution (t = 136.00)
Riemann Velocity: 0.1639
Max curvature: 0.0139
200
180
160
140
120
450
460
470
480
490
500
510

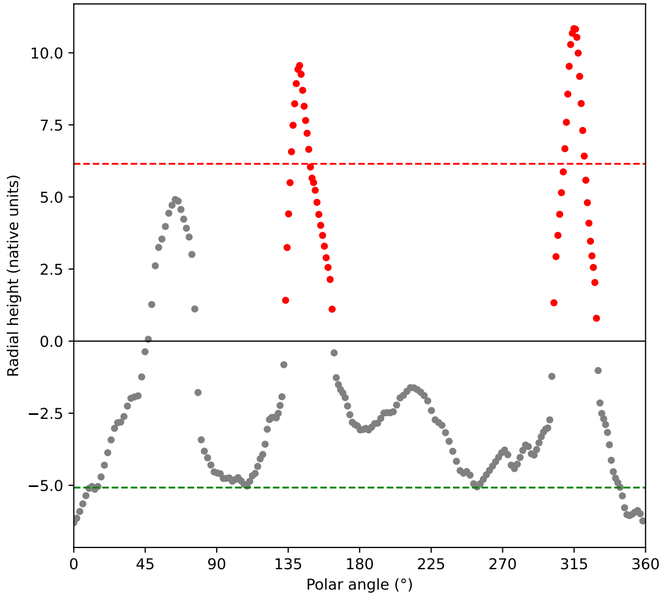

Topographical representation
Protrusions: 2
Intrusions: 0
40
20
0
−20
−40
−40
−20
0
20
40

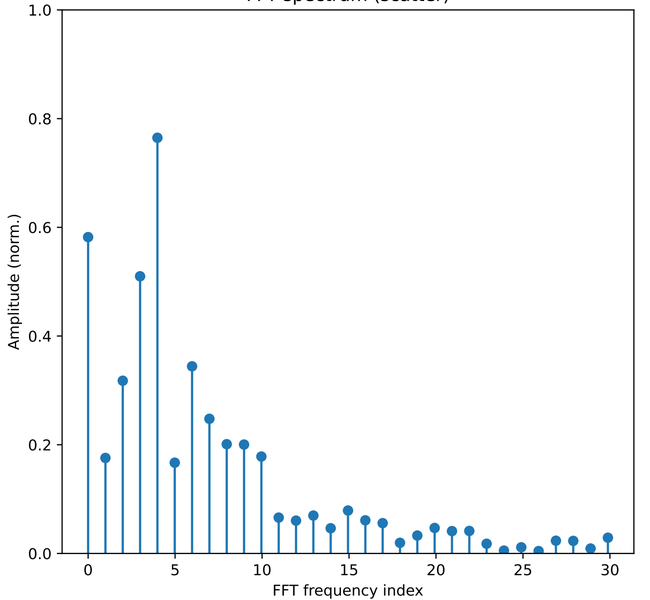

Topographical height
Radial height (native units)
Polar angle (°)
10.0
7.5
5.0
2.5
0.0
−2.5
−5.0
0
45
90
135
180
225
270
315
360

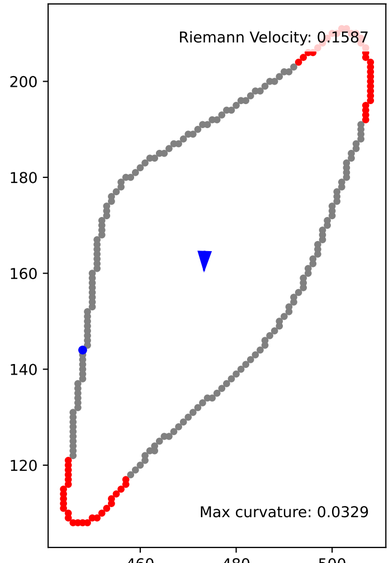

FFT spectrum (scatter)
Amplitude (norm.)
FFT frequency index
1.0
0.8
0.6
0.4
0.2
0.0
0
5
10
15
20
25
30

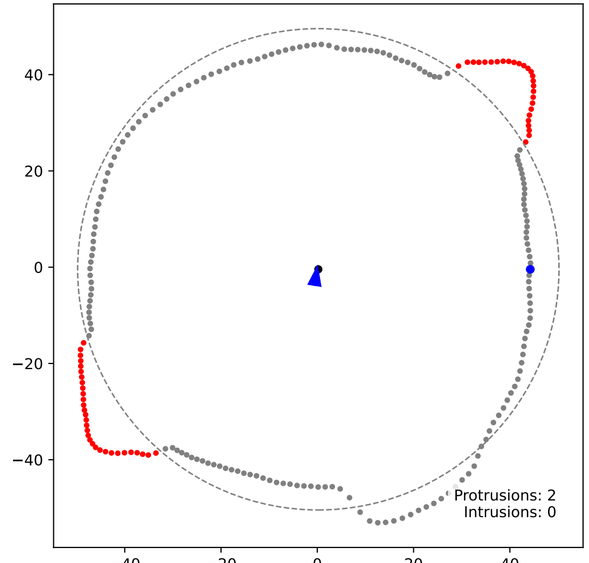

Shape evolution (t = 137.00)
Riemann Velocity: 0.1490
Max curvature: 0.0147
200
180
160
140
120
450
460
470
480
490
500
510

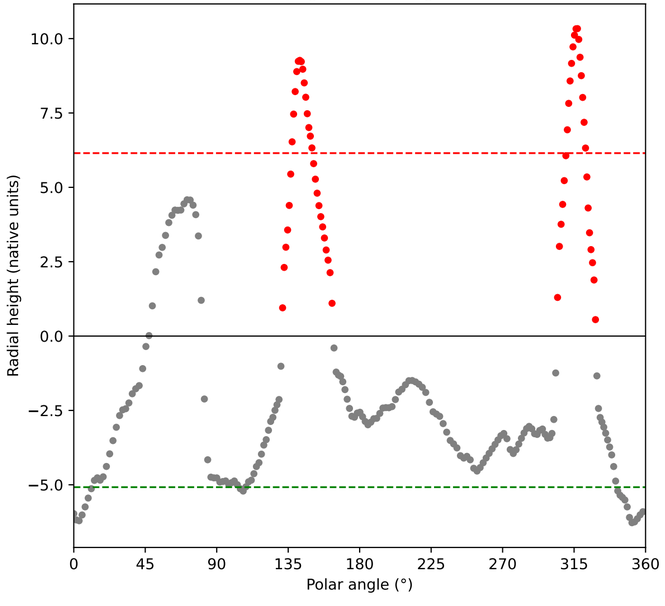

Topographical representation
Protrusions: 2
Intrusions: 0
40
20
0
−20
−40
−40
−20
0
20
40

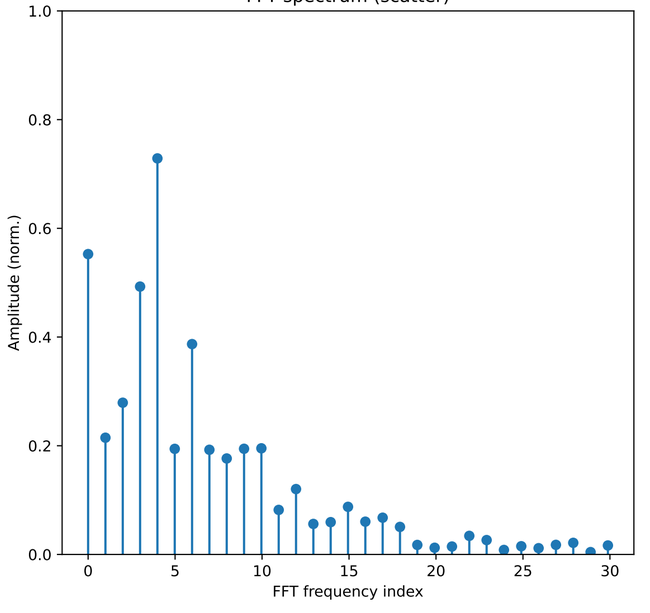

Topographical height
Radial height (native units)
Polar angle (°)
10.0
7.5
5.0
2.5
0.0
−2.5
−5.0
0
45
90
135
180
225
270
315
360

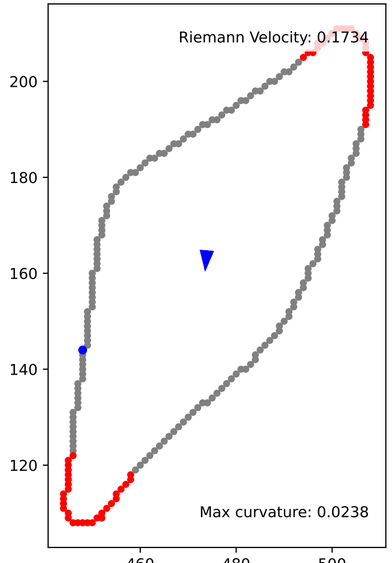

FFT spectrum (scatter)
Amplitude (norm.)
FFT frequency index
1.0
0.8
0.6
0.4
0.2
0.0
0
5
10
15
20
25
30

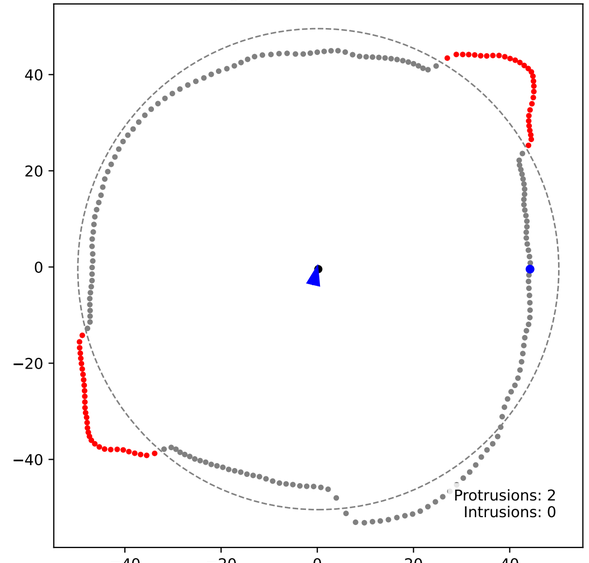

Shape evolution (t = 138.00)
Riemann Velocity: 0.1587
Max curvature: 0.0329
200
180
160
140
120
460
480
500

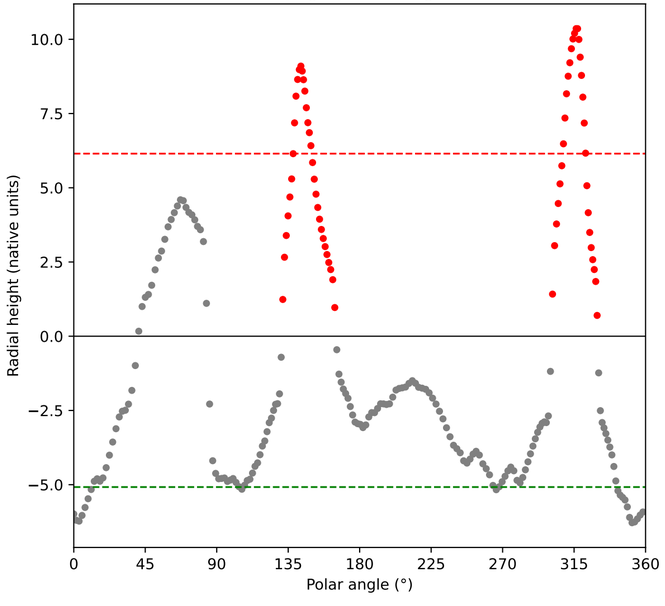

Topographical representation
Protrusions: 2
Intrusions: 0
40
20
0
−20
−40
−40
−20
0
20
40

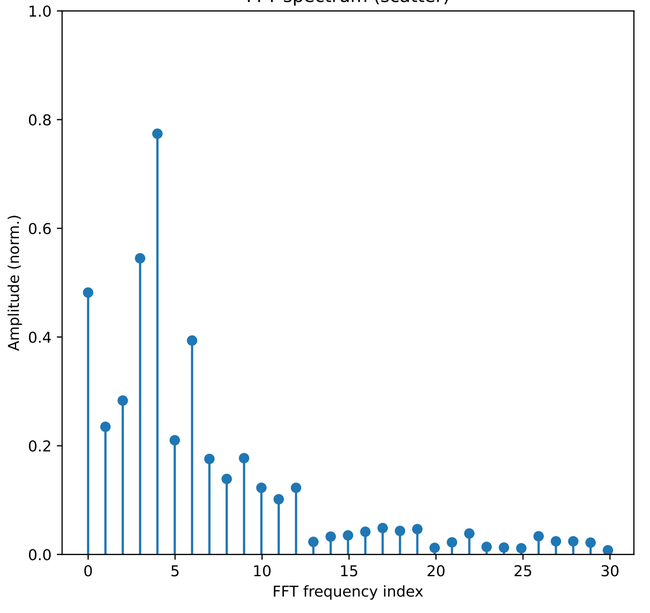

Topographical height
Radial height (native units)
Polar angle (°)
10.0
7.5
5.0
2.5
0.0
−2.5
−5.0
0
45
90
135
180
225
270
315
360

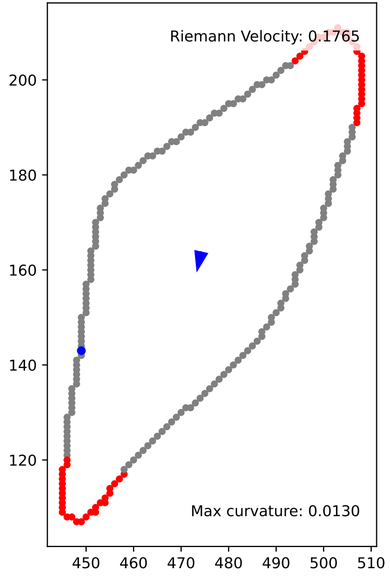

FFT spectrum (scatter)
Amplitude (norm.)
FFT frequency index
1.0
0.8
0.6
0.4
0.2
0.0
0
5
10
15
20
25
30

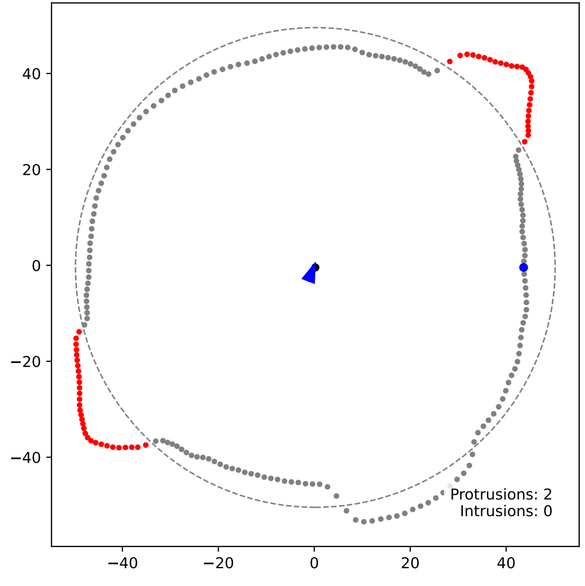

Shape evolution (t = 139.00)
Riemann Velocity: 0.1734
Max curvature: 0.0238
200
180
160
140
120
460
480
500

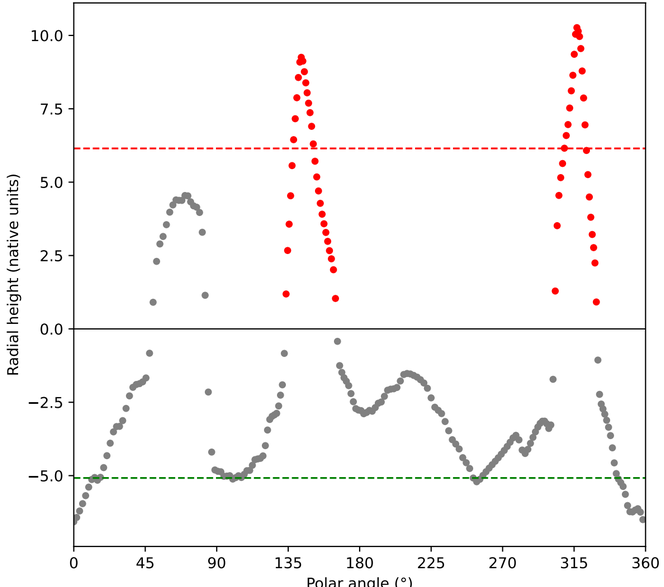

Topographical representation
Protrusions: 2
Intrusions: 0
40
20
0
−20
−40
−40
−20
0
20
40

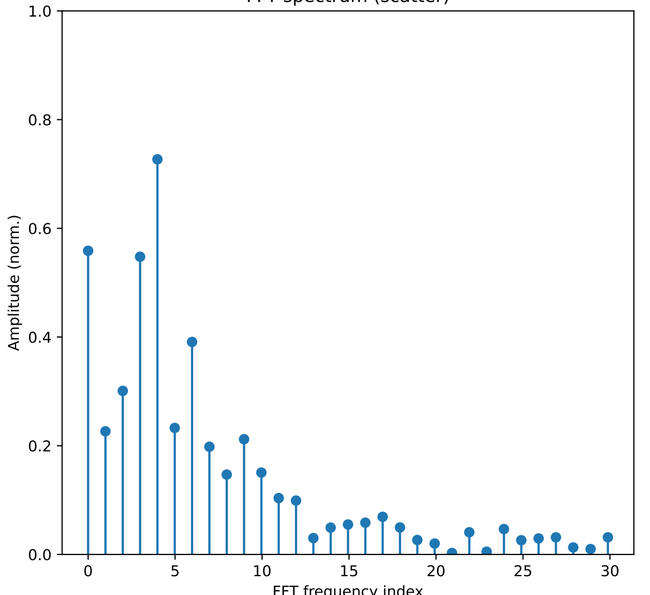

Topographical height
Radial height (native units)
Polar angle (°)
10.0
7.5
5.0
2.5
0.0
−2.5
−5.0
0
45
90
135
180
225
270
315
360

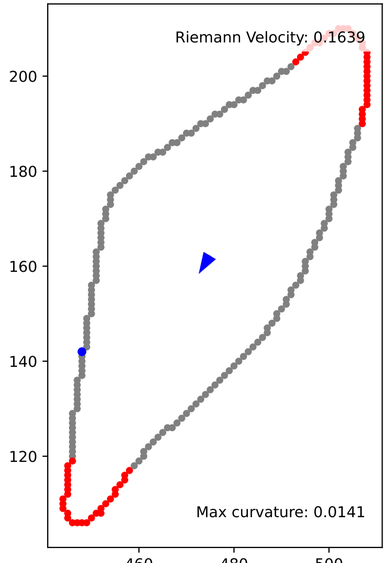

FFT spectrum (scatter)
Amplitude (norm.)
FFT frequency index
1.0
0.8
0.6
0.4
0.2
0.0
0
5
10
15
20
25
30

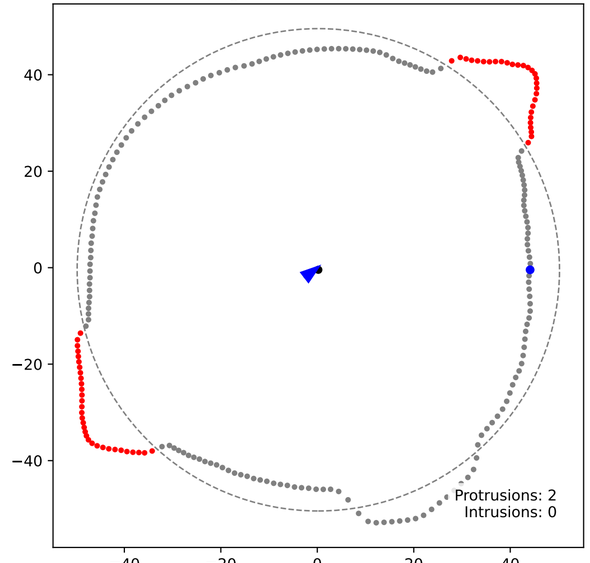

Shape evolution (t = 140.00)
Riemann Velocity: 0.1765
Max curvature: 0.0130
200
180
160
140
120
450
460
470
480
490
500
510

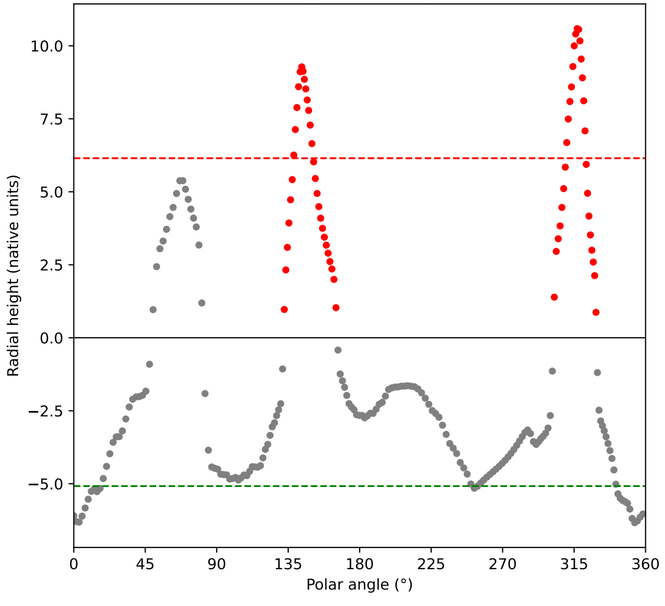

Topographical representation
Protrusions: 2
Intrusions: 0
40
20
0
−20
−40
−40
−20
0
20
40

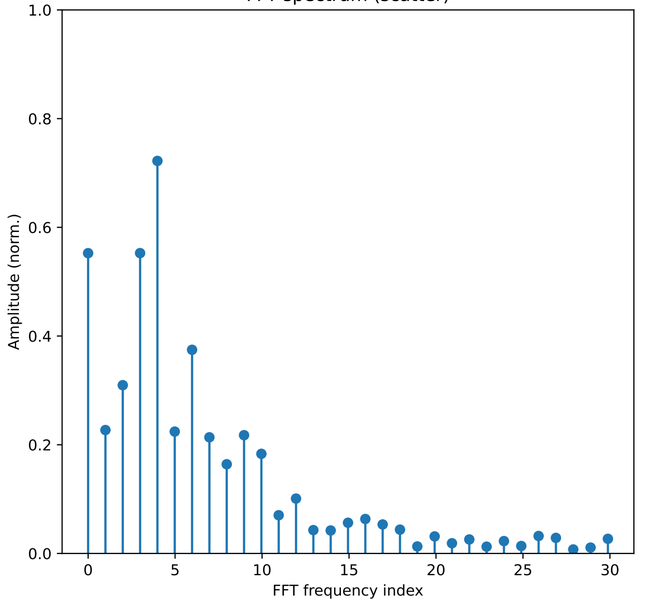

Topographical height
Radial height (native units)
Polar angle (°)
10.0
7.5
5.0
2.5
0.0
−2.5
−5.0
0
45
90
135
180
225
270
315
360

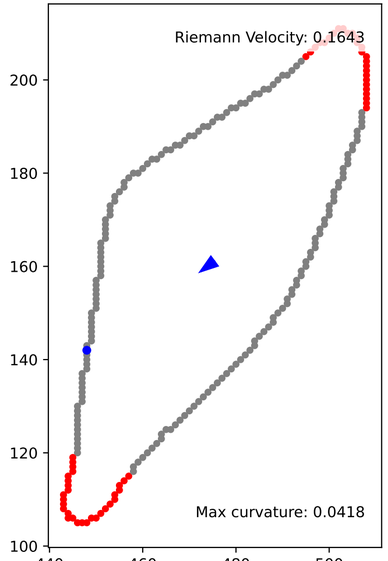

FFT spectrum (scatter)
Amplitude (norm.)
FFT frequency index
1.0
0.8
0.6
0.4
0.2
0.0
0
5
10
15
20
25
30

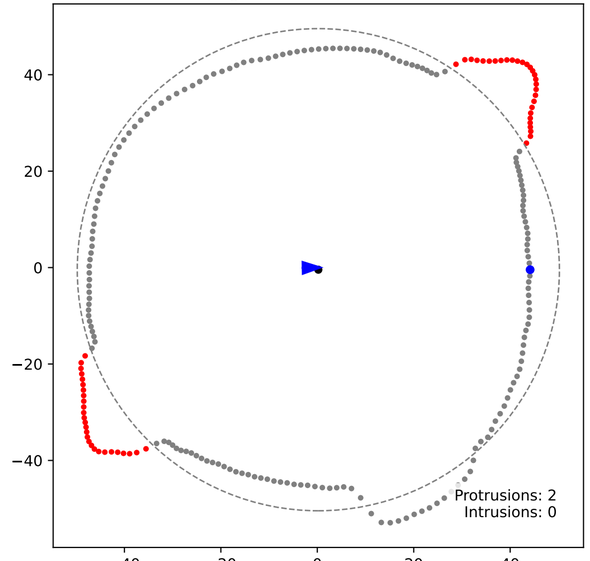

Shape evolution (t = 141.00)
Riemann Velocity: 0.1639
Max curvature: 0.0141
200
180
160
140
120
460
480
500

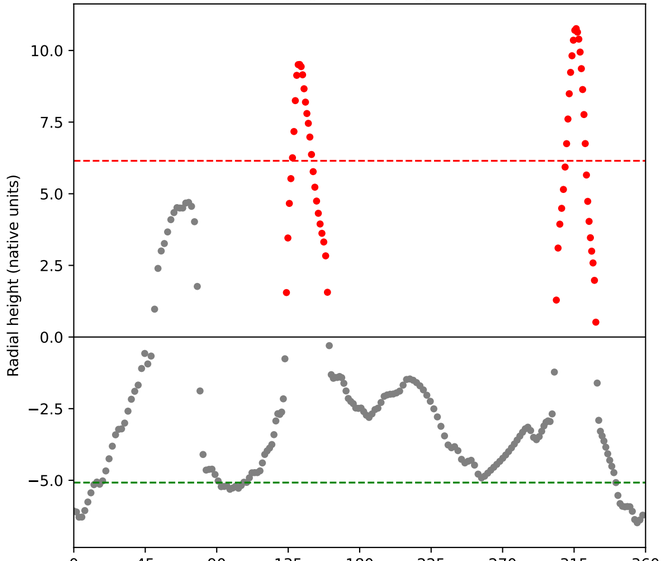

Topographical representation
Protrusions: 2
Intrusions: 0
40
20
0
−20
−40
−40
−20
0
20
40

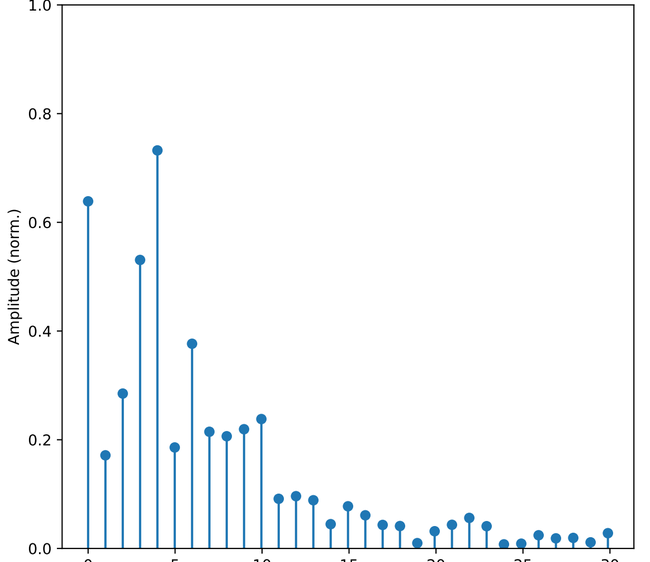

Topographical height
Radial height (native units)
Polar angle (°)
10.0
7.5
5.0
2.5
0.0
−2.5
−5.0
0
45
90
135
180
225
270
315
360

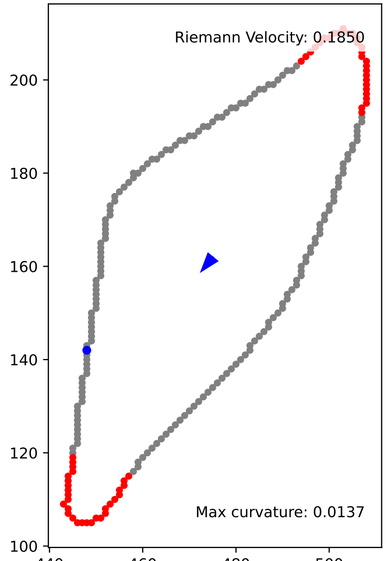

FFT spectrum (scatter)
Amplitude (norm.)
FFT frequency index
1.0
0.8
0.6
0.4
0.2
0.0
0
5
10
15
20
25
30

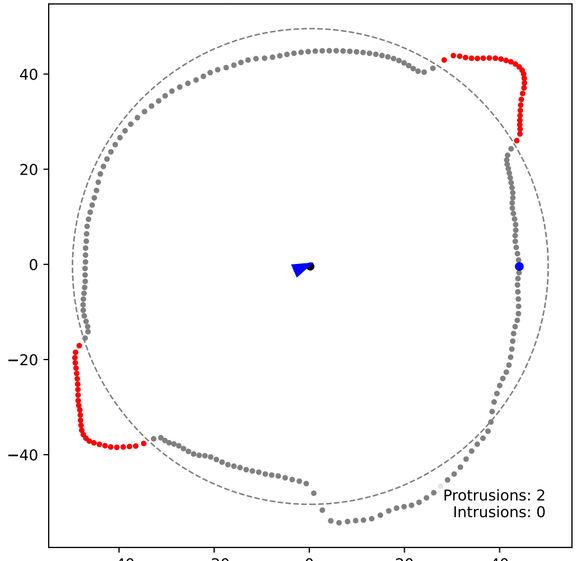

Shape evolution (t = 142.00)
Riemann Velocity: 0.1643
Max curvature: 0.0418
200
180
160
140
120
100
440
460
480
500

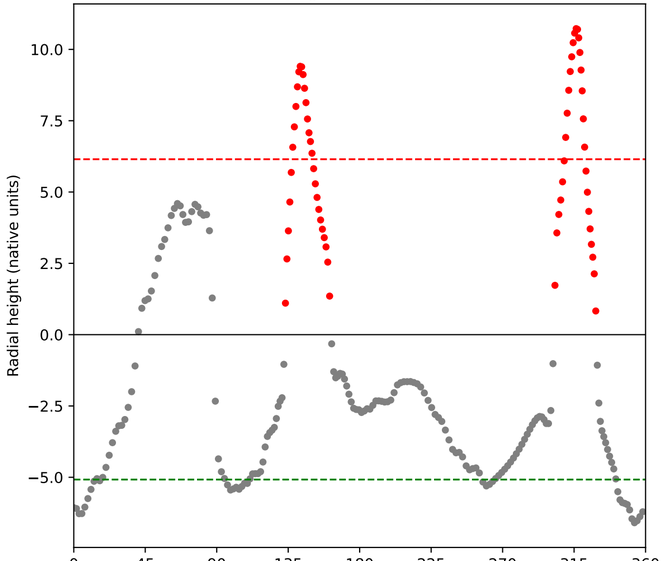

Topographical representation
Protrusions: 2
Intrusions: 0
40
20
0
−20
−40
−40
−20
0
20
40

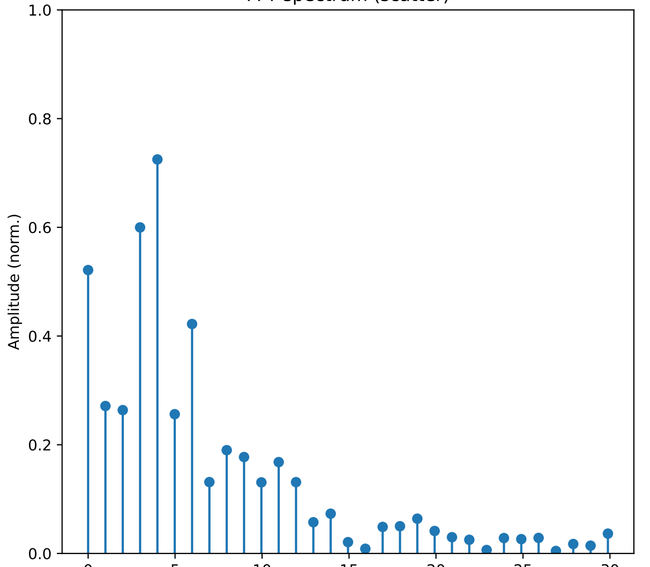

Topographical height
Radial height (native units)
Polar angle (°)
10.0
7.5
5.0
2.5
0.0
−2.5
−5.0
0
45
90
135
180
225
270
315
360

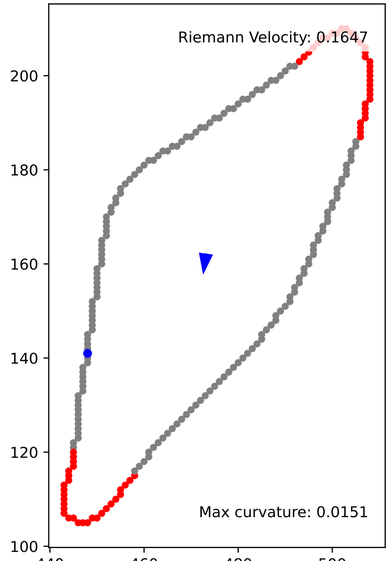

FFT spectrum (scatter)
Amplitude (norm.)
FFT frequency index
1.0
0.8
0.6
0.4
0.2
0.0
0
5
10
15
20
25
30

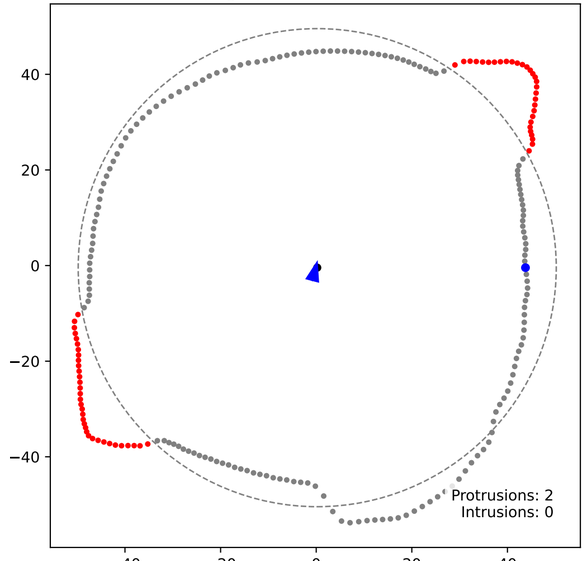

Shape evolution (t = 143.00)
Riemann Velocity: 0.1850
Max curvature: 0.0137
200
180
160
140
120
100
440
460
480
500

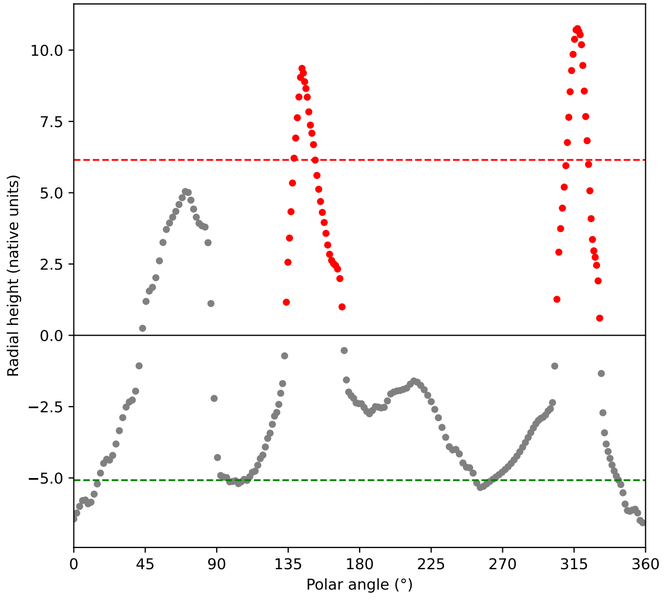

Topographical representation
Protrusions: 2
Intrusions: 0
40
20
0
−20
−40
−40
−20
0
20
40

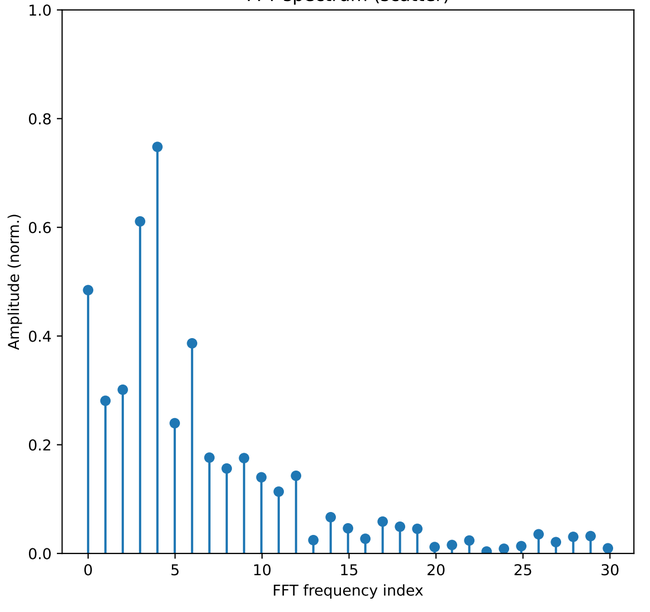

Topographical height
Radial height (native units)
Polar angle (°)
10.0
7.5
5.0
2.5
0.0
−2.5
−5.0
0
45
90
135
180
225
270
315
360

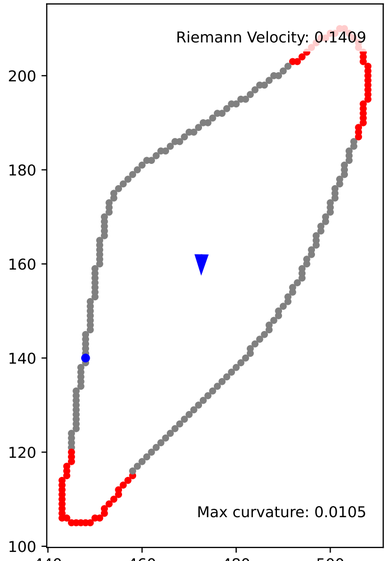

FFT spectrum (scatter)
Amplitude (norm.)
FFT frequency index
1.0
0.8
0.6
0.4
0.2
0.0
0
5
10
15
20
25
30

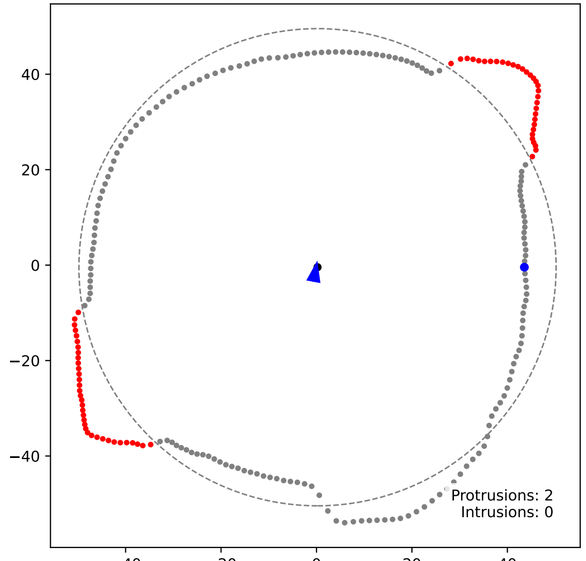

Shape evolution (t = 144.00)
Riemann Velocity: 0.1647
Max curvature: 0.0151
200
180
160
140
120
100
440
460
480
500

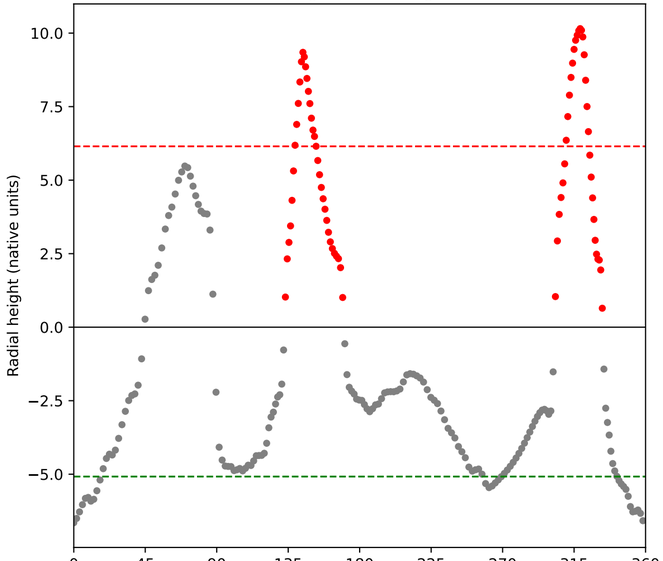

Topographical representation
Protrusions: 2
Intrusions: 0
40
20
0
−20
−40
−40
−20
0
20
40

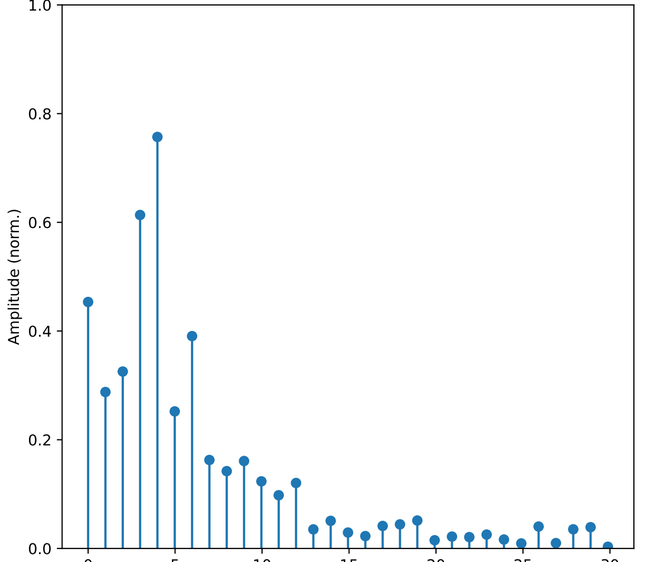

Topographical height
Radial height (native units)
Polar angle (°)
10.0
7.5
5.0
2.5
0.0
−2.5
−5.0
0
45
90
135
180
225
270
315
360

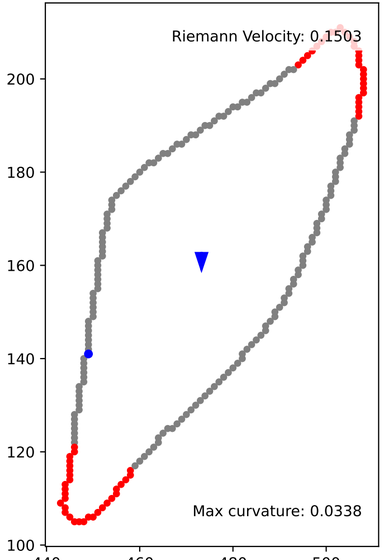

FFT spectrum (scatter)
Amplitude (norm.)
FFT frequency index
1.0
0.8
0.6
0.4
0.2
0.0
0
5
10
15
20
25
30

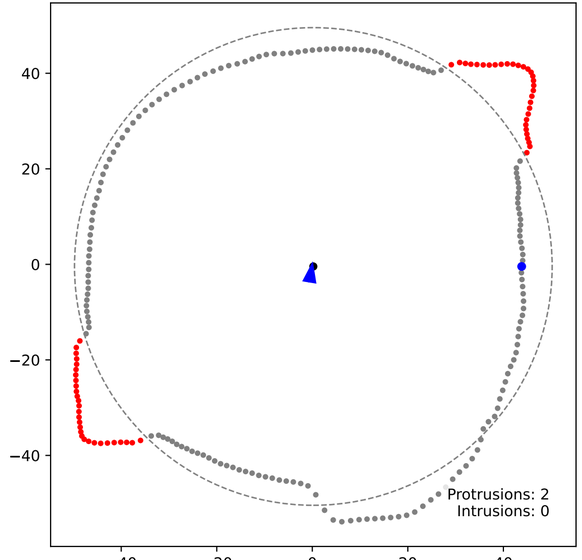

Shape evolution (t = 145.00)
Riemann Velocity: 0.1409
Max curvature: 0.0105
200
180
160
140
120
100
440
460
480
500

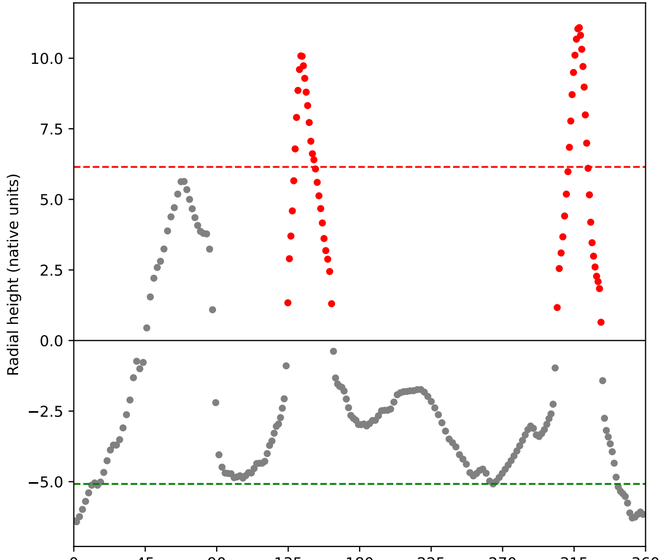

Topographical representation
Protrusions: 2
Intrusions: 0
40
20
0
−20
−40
−40
−20
0
20
40

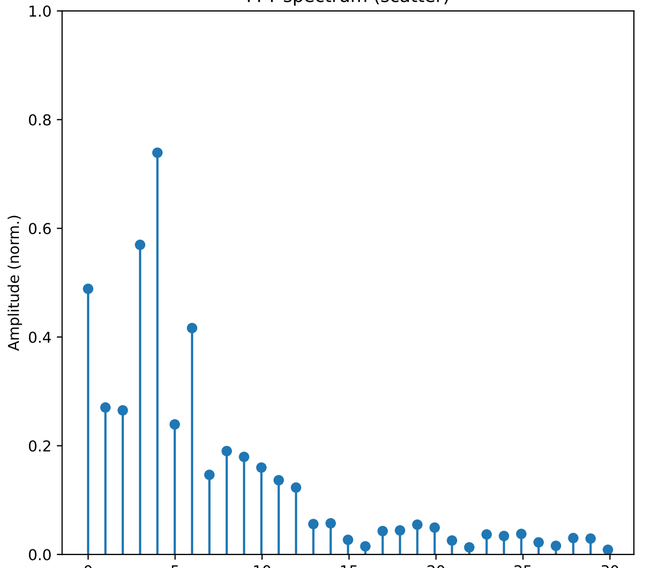

Topographical height
Radial height (native units)
Polar angle (°)
10.0
7.5
5.0
2.5
0.0
−2.5
−5.0
0
45
90
135
180
225
270
315
360

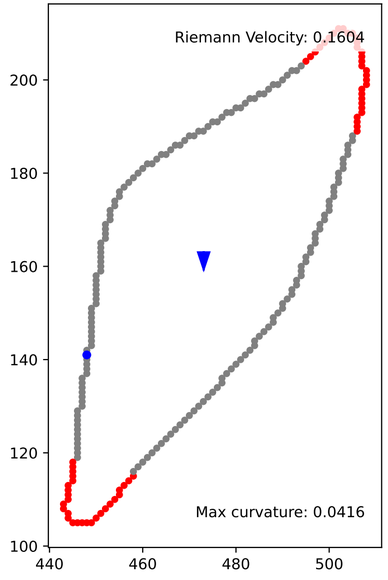

FFT spectrum (scatter)
Amplitude (norm.)
FFT frequency index
1.0
0.8
0.6
0.4
0.2
0.0
0
5
10
15
20
25
30

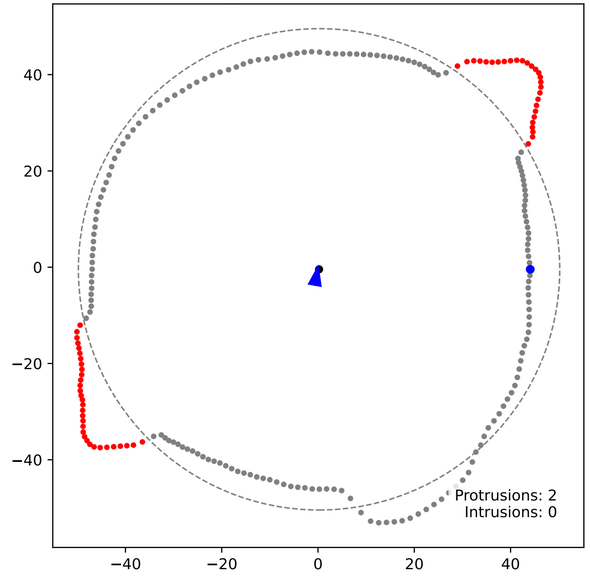

Shape evolution (t = 146.00)
Riemann Velocity: 0.1503
Max curvature: 0.0338
200
180
160
140
120
100
440
460
480
500

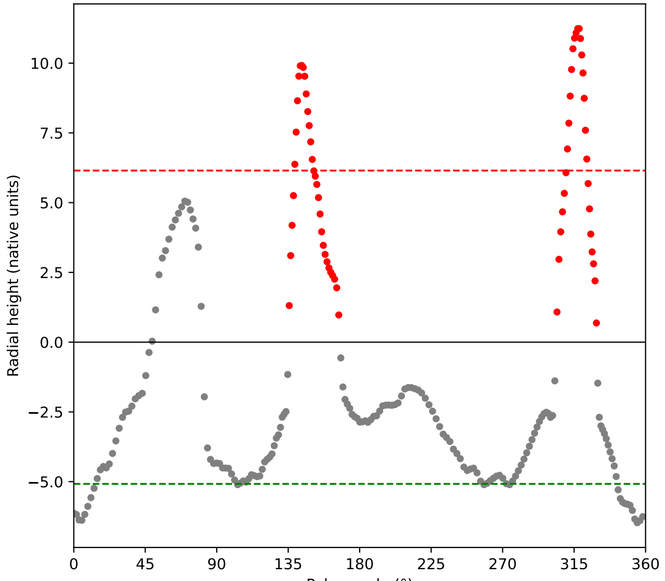

Topographical representation
Protrusions: 2
Intrusions: 0
40
20
0
−20
−40
−40
−20
0
20
40

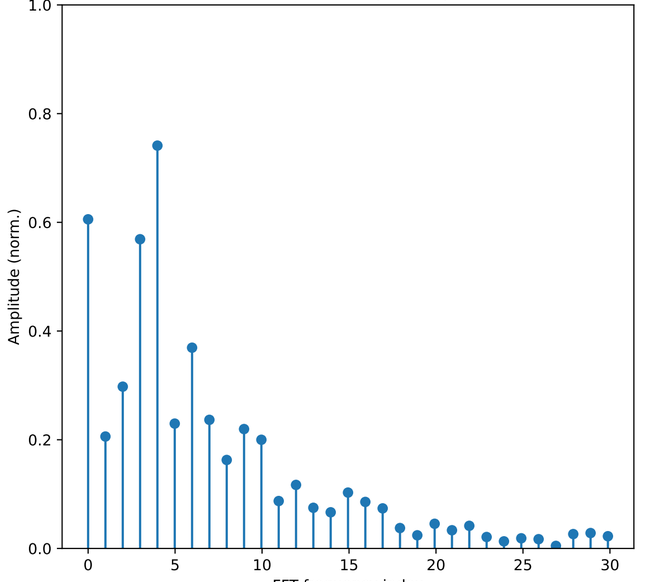

Topographical height
Radial height (native units)
Polar angle (°)
10.0
7.5
5.0
2.5
0.0
−2.5
−5.0
0
45
90
135
180
225
270
315
360

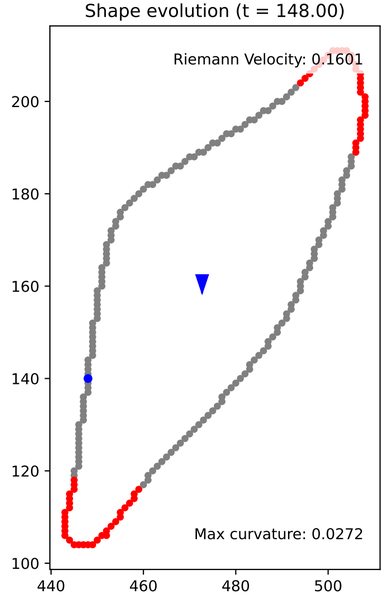

FFT spectrum (scatter)
Amplitude (norm.)
FFT frequency index
1.0
0.8
0.6
0.4
0.2
0.0
0
5
10
15
20
25
30

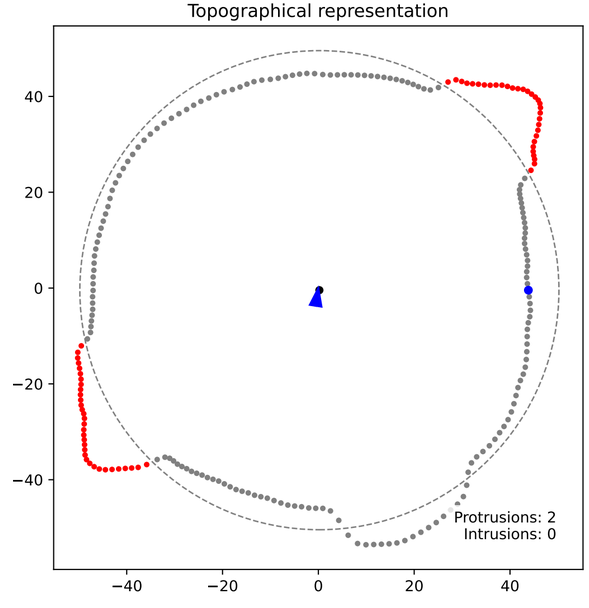

Shape evolution (t = 147.00)
Riemann Velocity: 0.1604
Max curvature: 0.0416
200
180
160
140
120
100
440
460
480
500

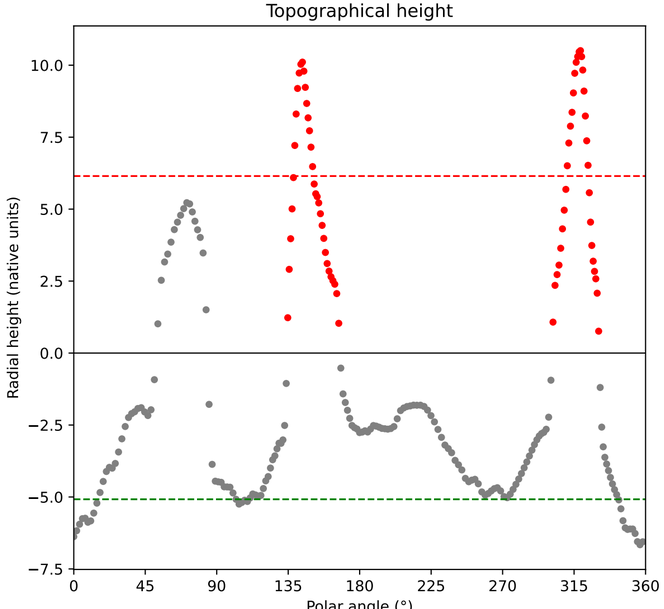

Topographical representation
Protrusions: 2
Intrusions: 0
40
20
0
−20
−40
−40
−20
0
20
40

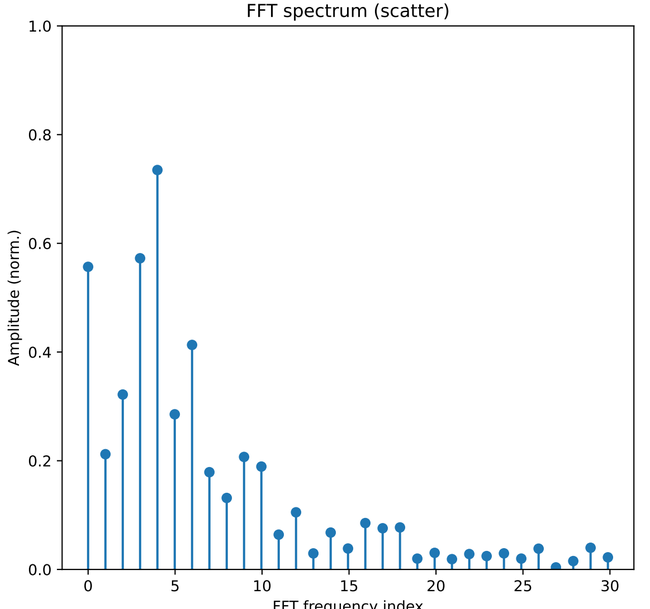

Topographical height
Radial height (native units)
Polar angle (°)
10.0
7.5
5.0
2.5
0.0
−2.5
−5.0
0
45
90
135
180
225
270
315
360

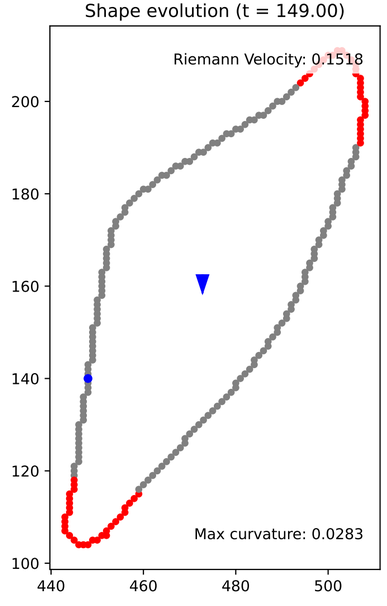

FFT spectrum (scatter)
Amplitude (norm.)
FFT frequency index
1.0
0.8
0.6
0.4
0.2
0.0
0
5
10
15
20
25
30

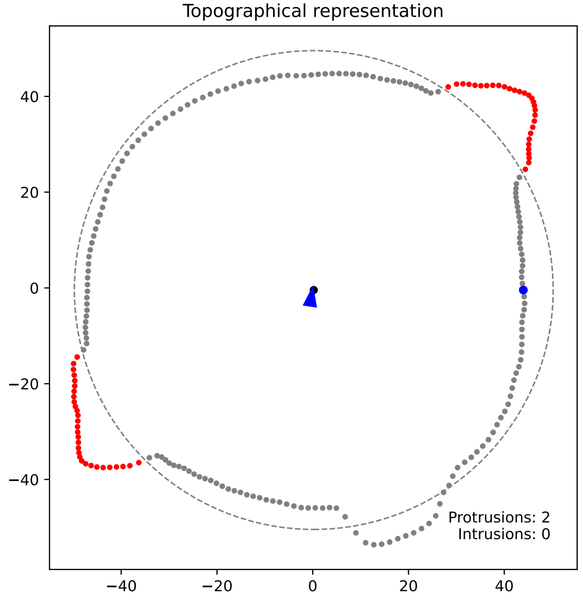

Shape evolution (t = 148.00)
Riemann Velocity: 0.1601
Max curvature: 0.0272
200
180
160
140
120
100
440
460
480
500

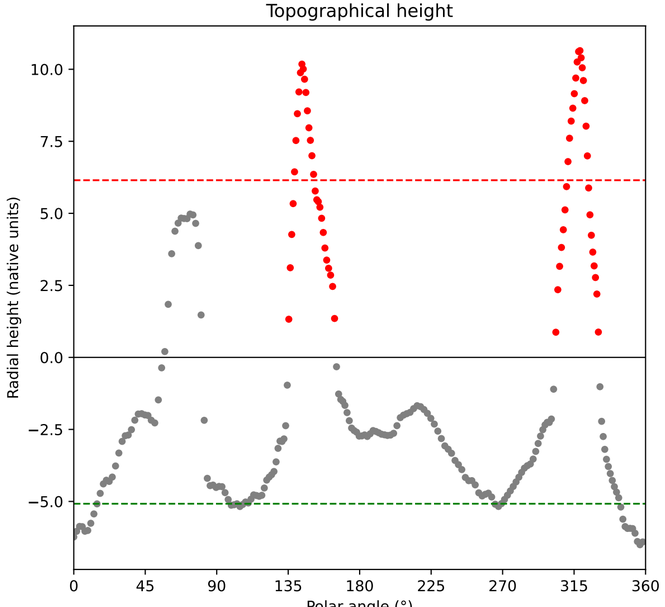

Topographical representation
Protrusions: 2
Intrusions: 0
40
20
0
−20
−40
−40
−20
0
20
40

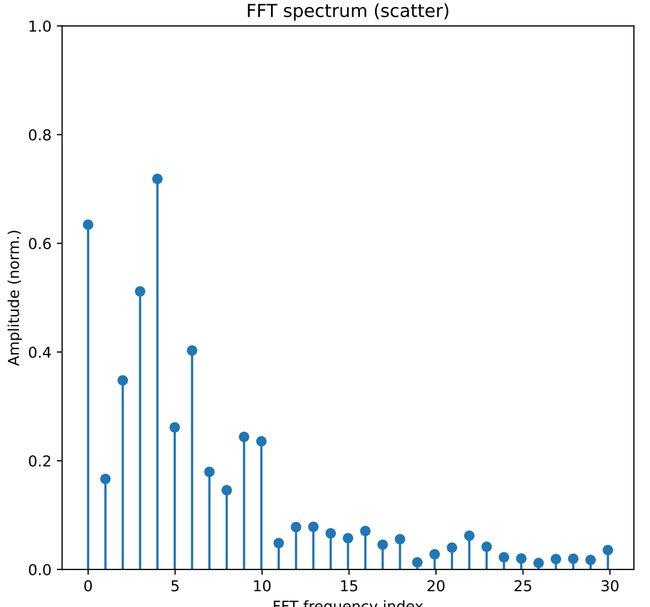

Topographical height
Radial height (native units)
Polar angle (°)
10.0
7.5
5.0
2.5
0.0
−2.5
−5.0
−7.5
0
45
90
135
180
225
270
315
360

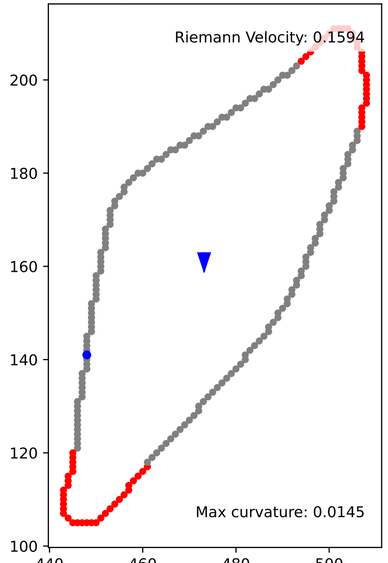

FFT spectrum (scatter)
Amplitude (norm.)
FFT frequency index
1.0
0.8
0.6
0.4
0.2
0.0
0
5
10
15
20
25
30

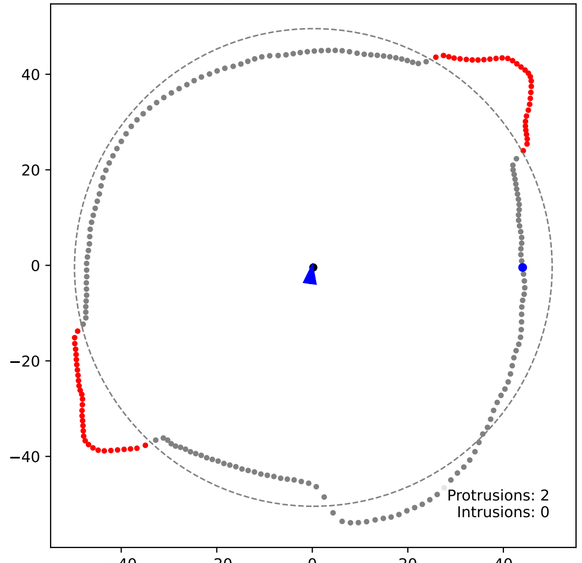

Shape evolution (t = 149.00)
Riemann Velocity: 0.1518
Max curvature: 0.0283
200
180
160
140
120
100
440
460
480
500

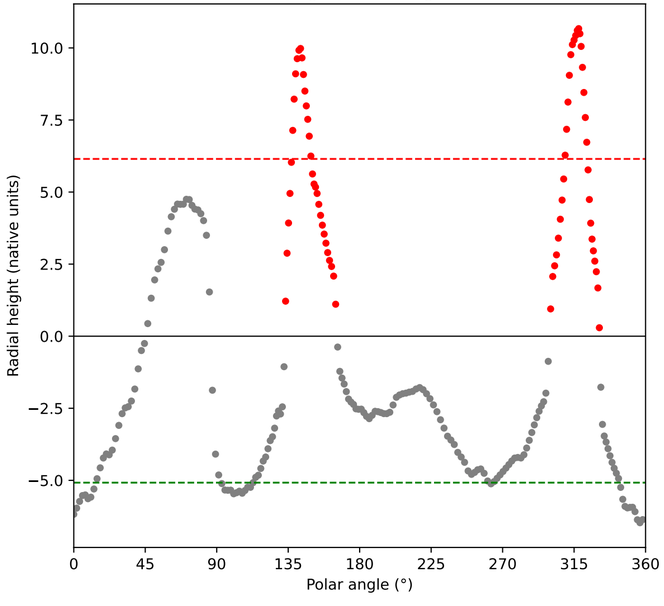

Topographical representation
Protrusions: 2
Intrusions: 0
40
20
0
−20
−40
−40
−20
0
20
40

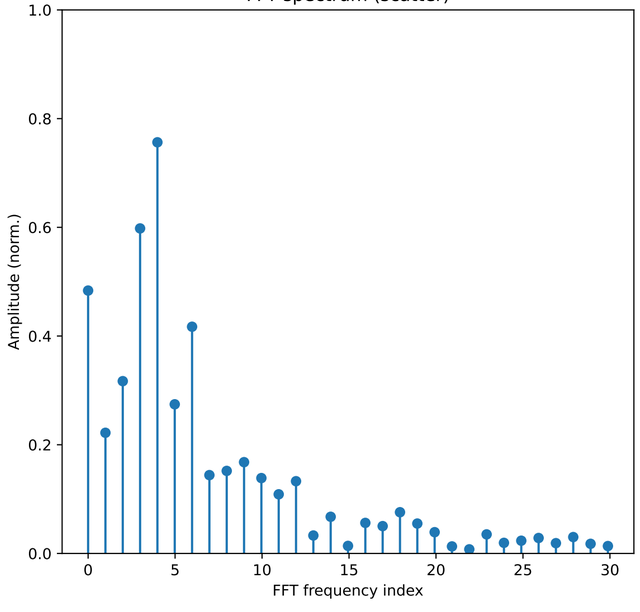

Topographical height
Radial height (native units)
Polar angle (°)
10.0
7.5
5.0
2.5
0.0
−2.5
−5.0
0
45
90
135
180
225
270
315
360

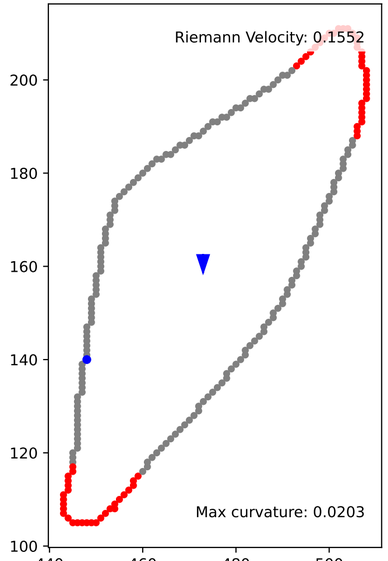

FFT spectrum (scatter)
Amplitude (norm.)
FFT frequency index
1.0
0.8
0.6
0.4
0.2
0.0
0
5
10
15
20
25
30

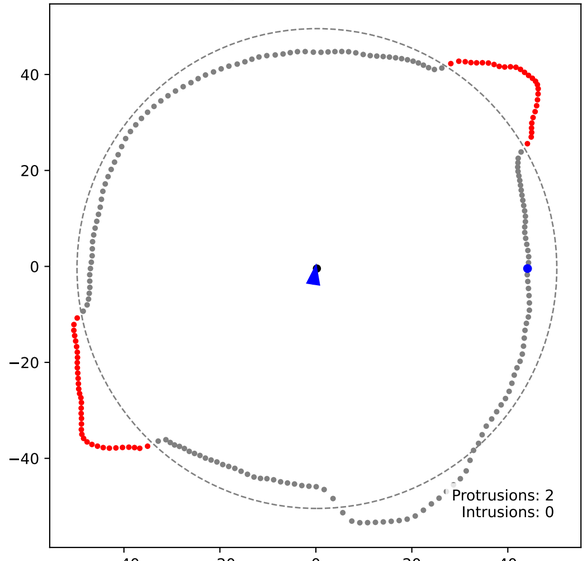

Shape evolution (t = 150.00)
Riemann Velocity: 0.1594
Max curvature: 0.0145
200
180
160
140
120
100
440
460
480
500

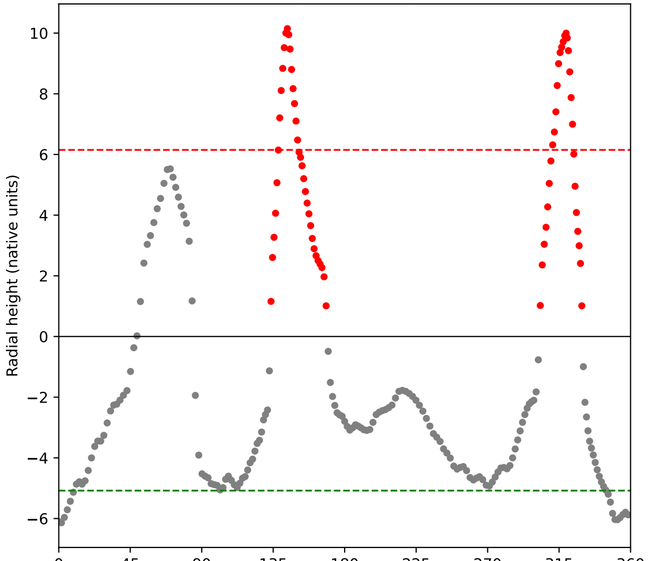

Topographical representation
Protrusions: 2
Intrusions: 0
40
20
0
−20
−40
−40
−20
0
20
40

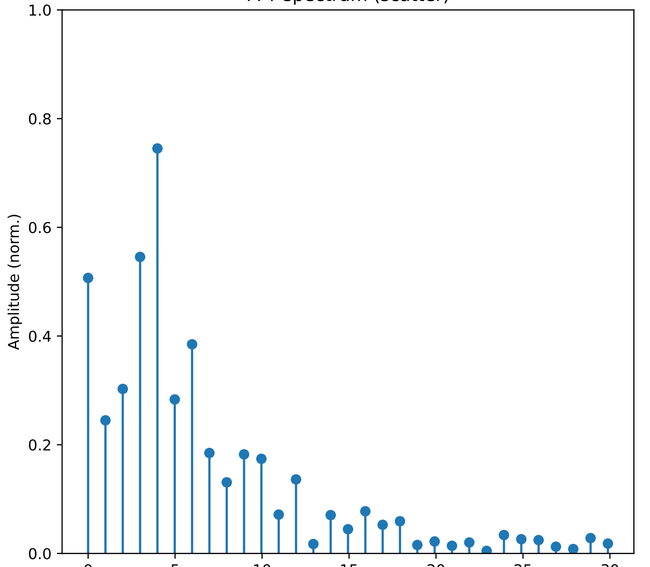

Topographical height
Radial height (native units)
Polar angle (°)
10.0
7.5
5.0
2.5
0.0
−2.5
−5.0
0
45
90
135
180
225
270
315
360

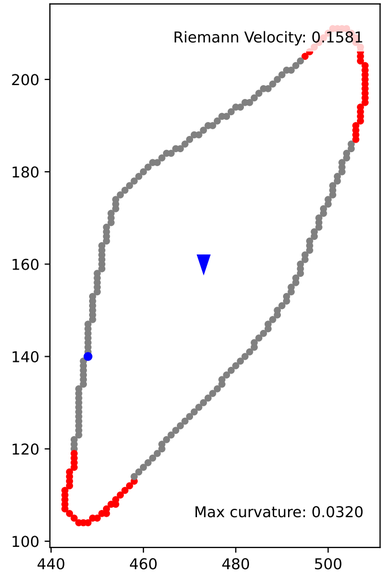

FFT spectrum (scatter)
Amplitude (norm.)
FFT frequency index
1.0
0.8
0.6
0.4
0.2
0.0
0
5
10
15
20
25
30

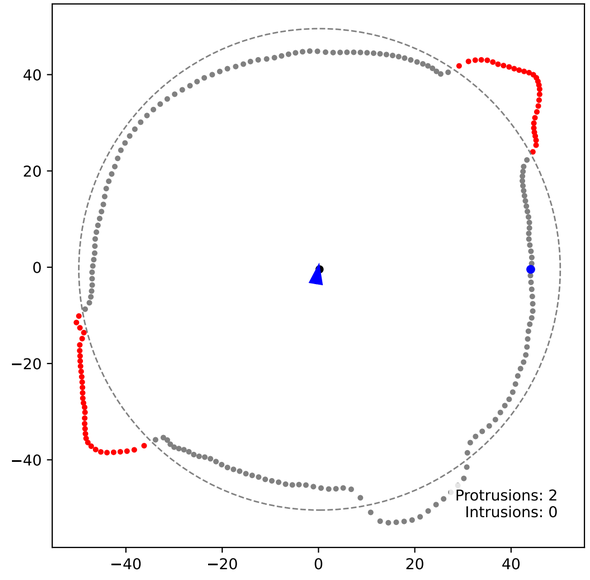

Shape evolution (t = 151.00)
Riemann Velocity: 0.1552
Max curvature: 0.0203
200
180
160
140
120
100
440
460
480
500

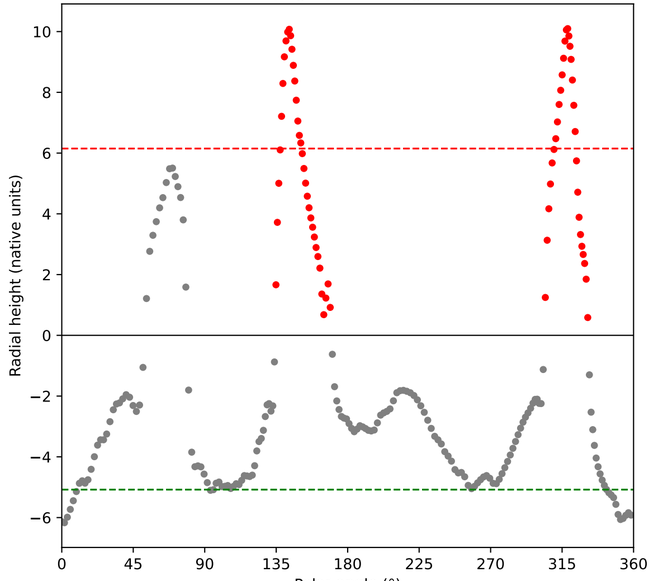

Topographical representation
Protrusions: 2
Intrusions: 0
40
20
0
−20
−40
−40
−20
0
20
40

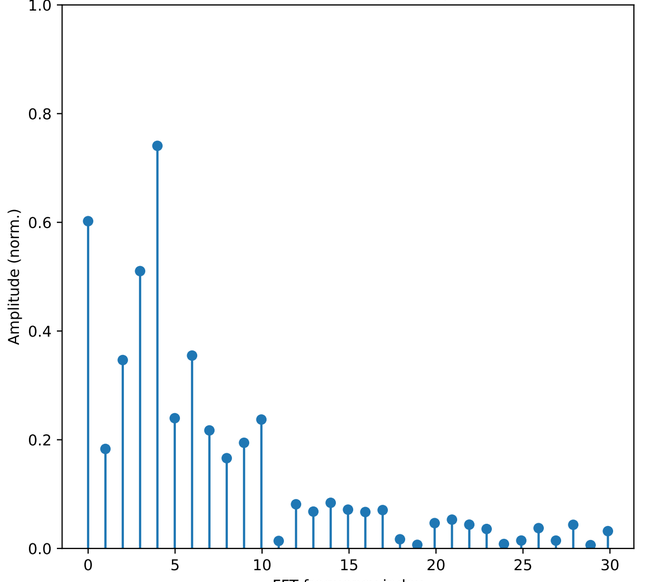

Topographical height
Radial height (native units)
Polar angle (°)
10
8
6
4
2
0
−2
−4
−6
0
45
90
135
180
225
270
315
360

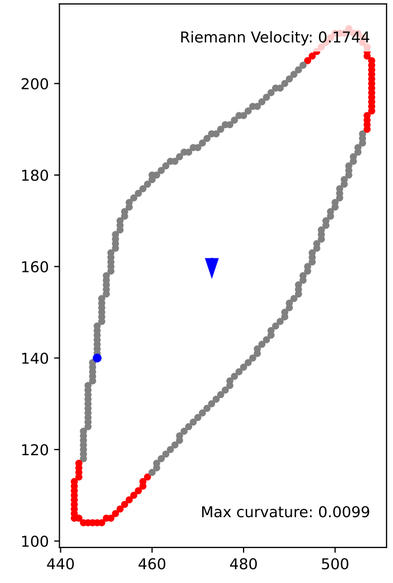

FFT spectrum (scatter)
Amplitude (norm.)
FFT frequency index
1.0
0.8
0.6
0.4
0.2
0.0
0
5
10
15
20
25
30

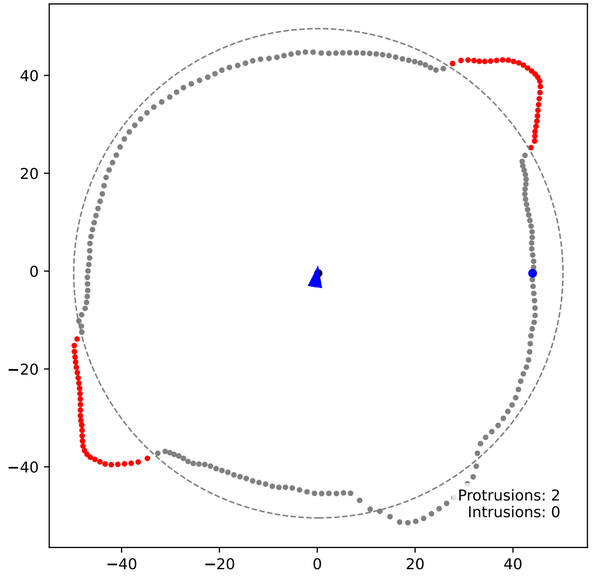

Shape evolution (t = 152.00)
Riemann Velocity: 0.1581
Max curvature: 0.0320
200
180
160
140
120
100
440
460
480
500

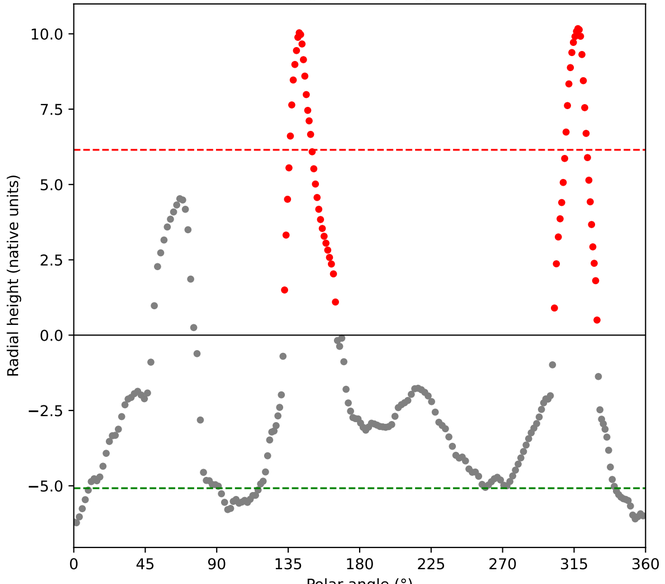

Topographical representation
Protrusions: 2
Intrusions: 0
40
20
0
−20
−40
−40
−20
0
20
40

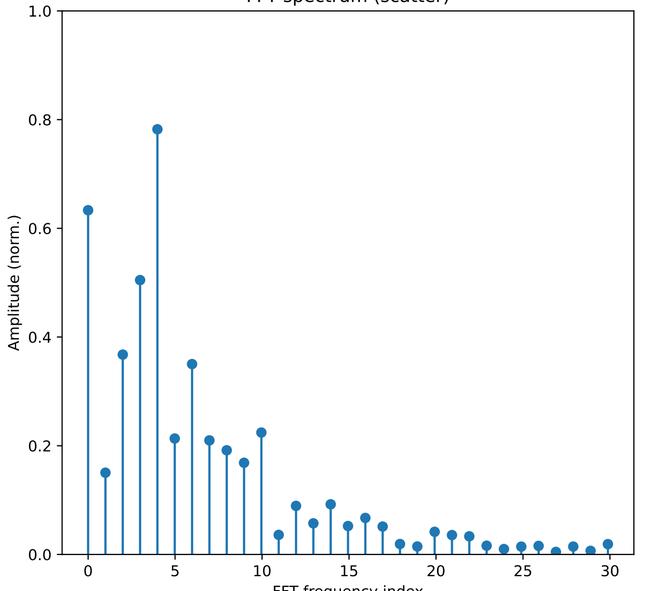

Topographical height
Radial height (native units)
Polar angle (°)
10
8
6
4
2
0
−2
−4
−6
0
45
90
135
180
225
270
315
360

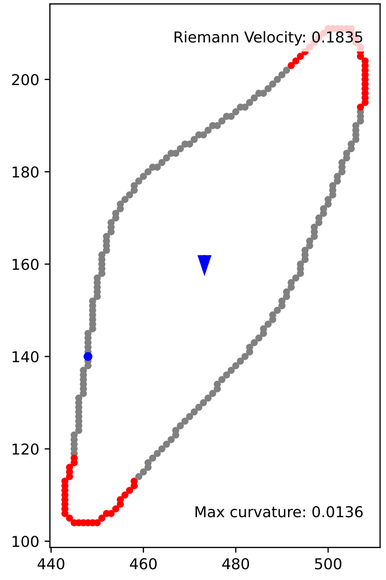

FFT spectrum (scatter)
Amplitude (norm.)
FFT frequency index
1.0
0.8
0.6
0.4
0.2
0.0
0
5
10
15
20
25
30

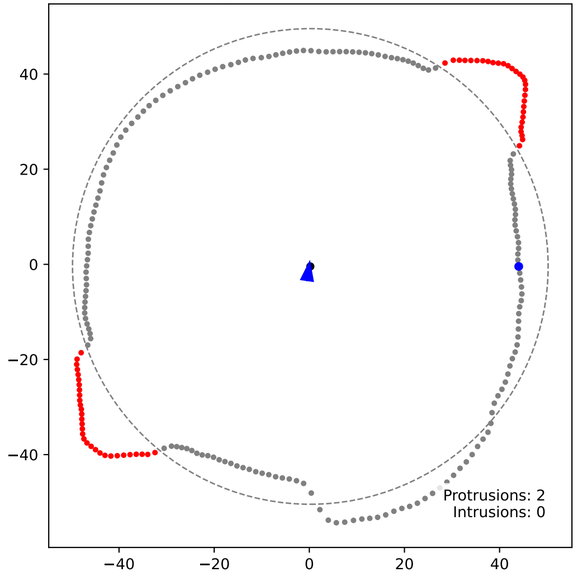

Shape evolution (t = 153.00)
Riemann Velocity: 0.1744
Max curvature: 0.0099
200
180
160
140
120
100
440
460
480
500

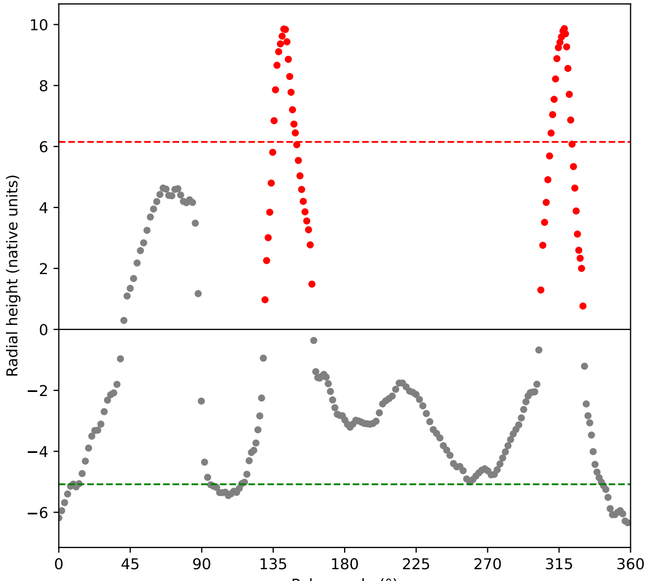

Topographical representation
Protrusions: 2
Intrusions: 0
40
20
0
−20
−40
−40
−20
0
20
40

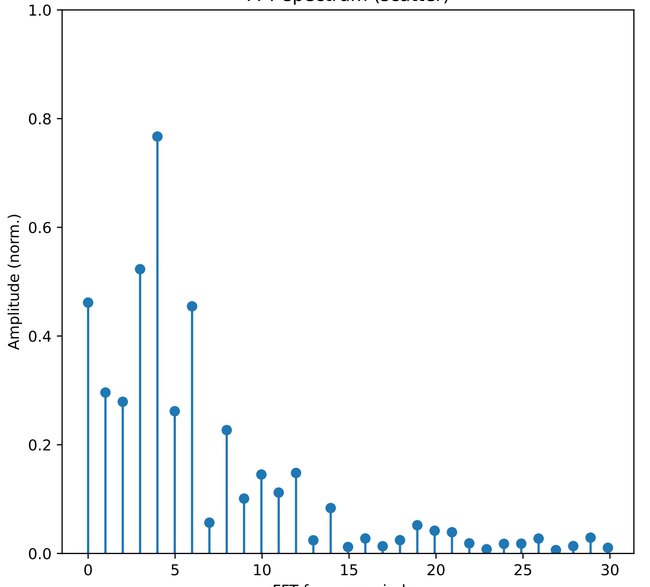

Topographical height
Radial height (native units)
Polar angle (°)
10.0
7.5
5.0
2.5
0.0
−2.5
−5.0
0
45
90
135
180
225
270
315
360

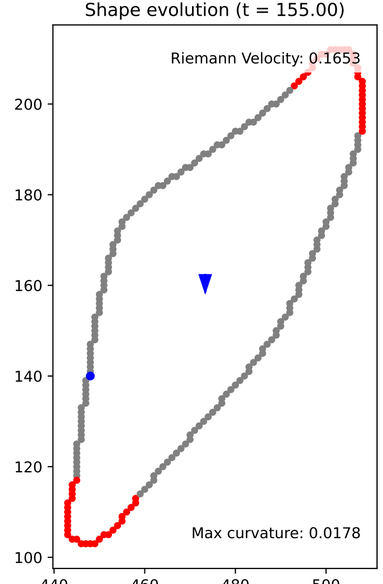

FFT spectrum (scatter)
Amplitude (norm.)
FFT frequency index
1.0
0.8
0.6
0.4
0.2
0.0
0
5
10
15
20
25
30

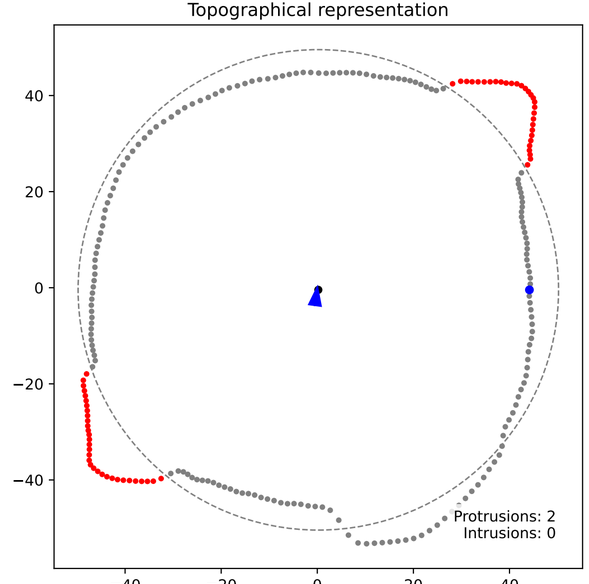

Shape evolution (t = 154.00)
Riemann Velocity: 0.1835
Max curvature: 0.0136
200
180
160
140
120
100
440
460
480
500

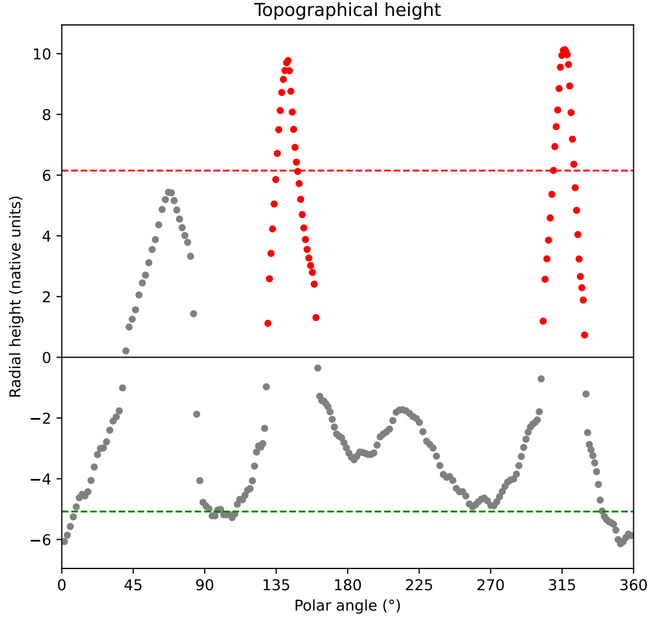

Topographical representation
Protrusions: 2
Intrusions: 0
40
20
0
−20
−40
−40
−20
0
20
40

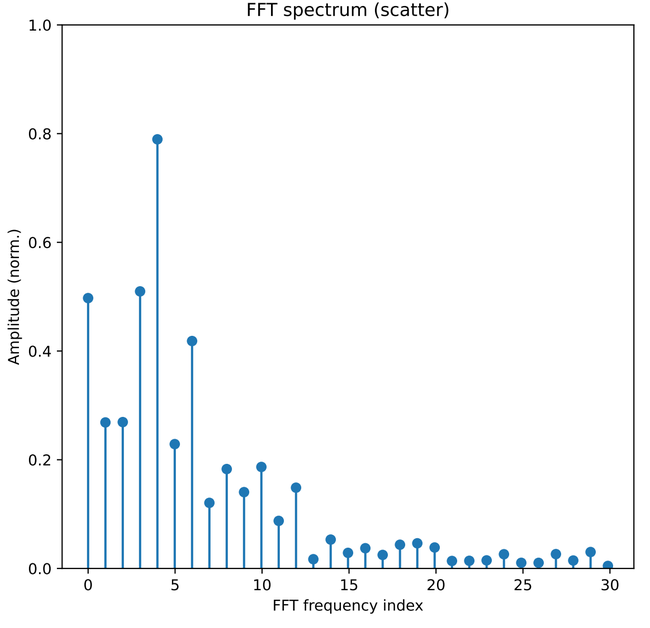

Topographical height
Radial height (native units)
Polar angle (°)
10
8
6
4
2
0
−2
−4
−6
0
45
90
135
180
225
270
315
360

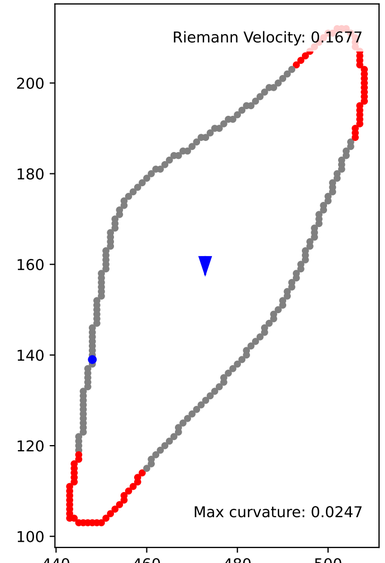

FFT spectrum (scatter)
Amplitude (norm.)
FFT frequency index
1.0
0.8
0.6
0.4
0.2
0.0
0
5
10
15
20
25
30

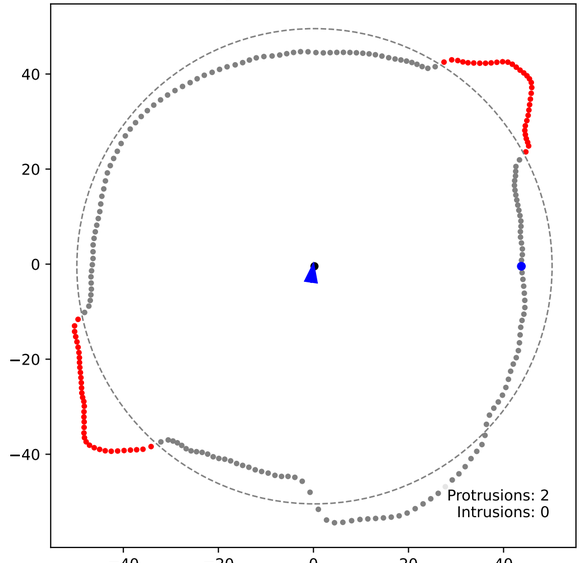

Shape evolution (t = 155.00)
Riemann Velocity: 0.1653
Max curvature: 0.0178
200
180
160
140
120
100
440
460
480
500

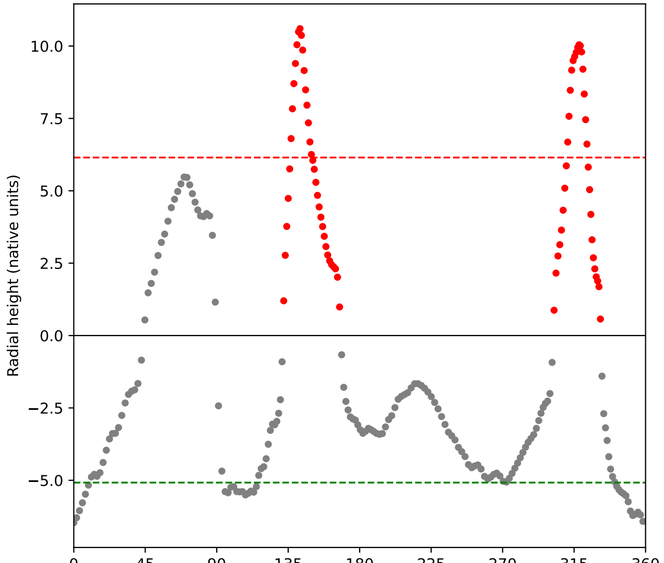

Topographical representation
Protrusions: 2
Intrusions: 0
40
20
0
−20
−40
−40
−20
0
20
40

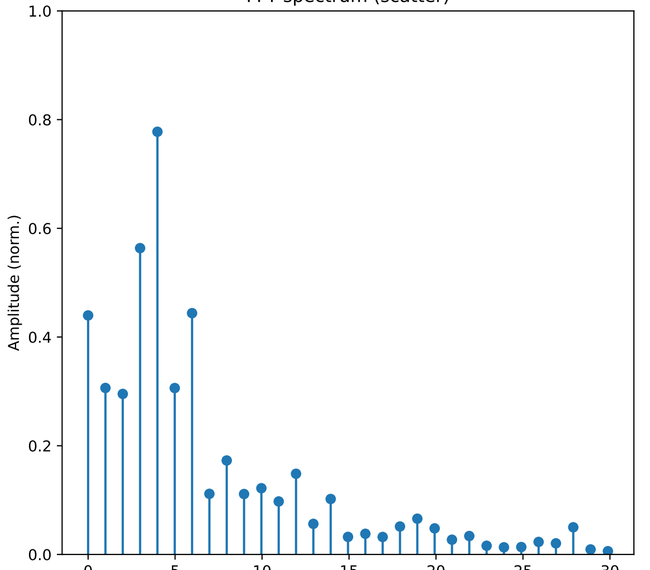

Topographical height
Radial height (native units)
Polar angle (°)
10
8
6
4
2
0
−2
−4
−6
0
45
90
135
180
225
270
315
360

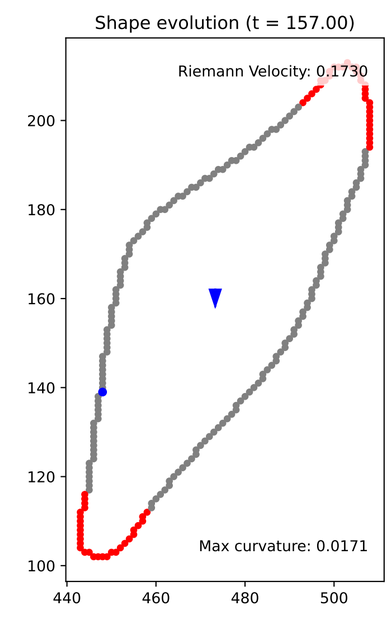

FFT spectrum (scatter)
Amplitude (norm.)
FFT frequency index
1.0
0.8
0.6
0.4
0.2
0.0
0
5
10
15
20
25
30

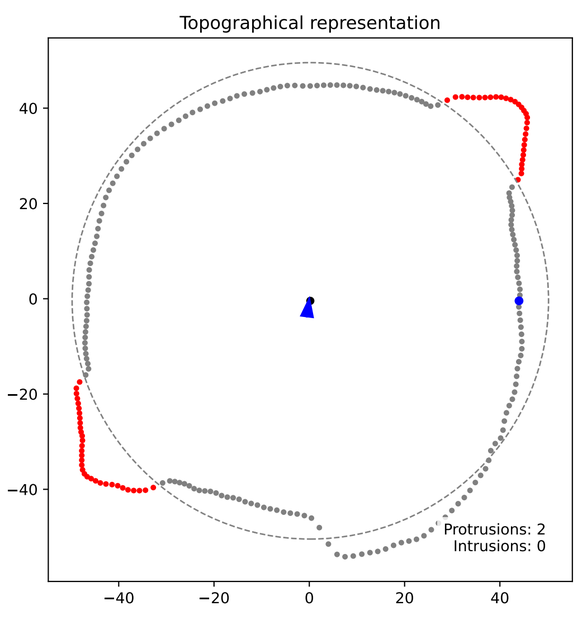

Shape evolution (t = 156.00)
Riemann Velocity: 0.1677
Max curvature: 0.0247
200
180
160
140
120
100
440
460
480
500

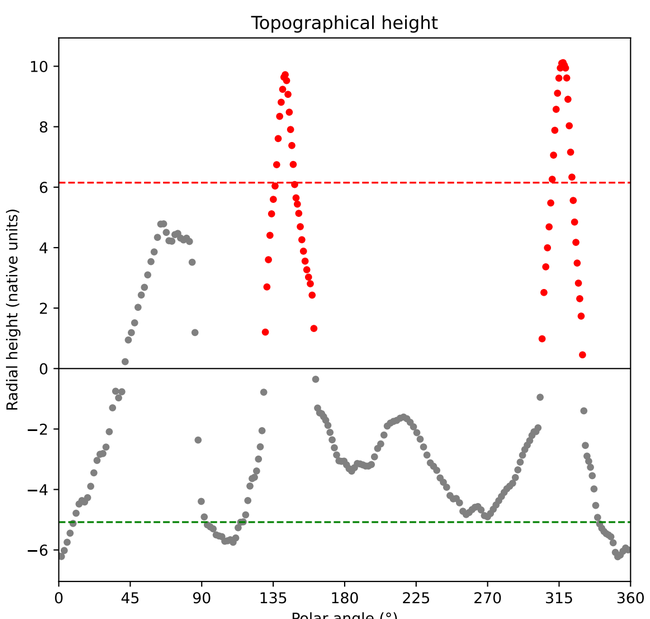

Topographical representation
Protrusions: 2
Intrusions: 0
40
20
0
−20
−40
−40
−20
0
20
40

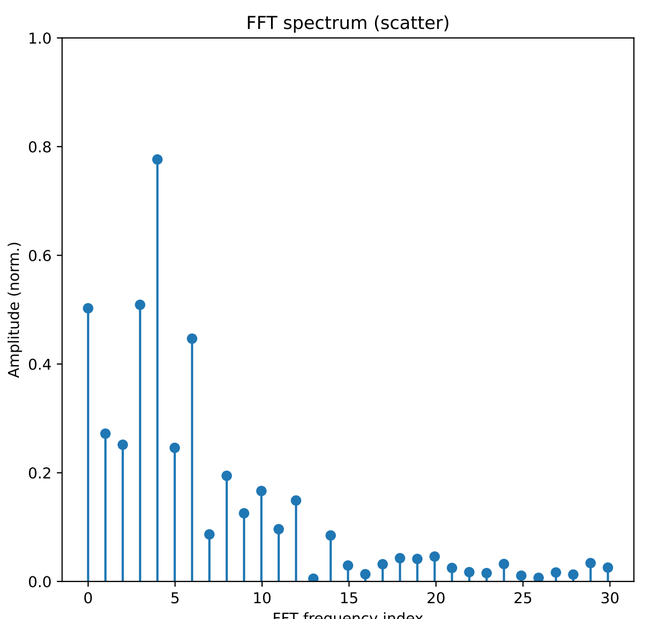

Topographical height
Radial height (native units)
Polar angle (°)
10.0
7.5
5.0
2.5
0.0
−2.5
−5.0
0
45
90
135
180
225
270
315
360

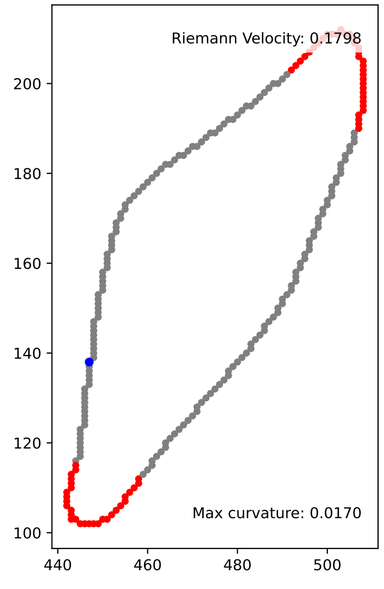

FFT spectrum (scatter)
Amplitude (norm.)
FFT frequency index
1.0
0.8
0.6
0.4
0.2
0.0
0
5
10
15
20
25
30

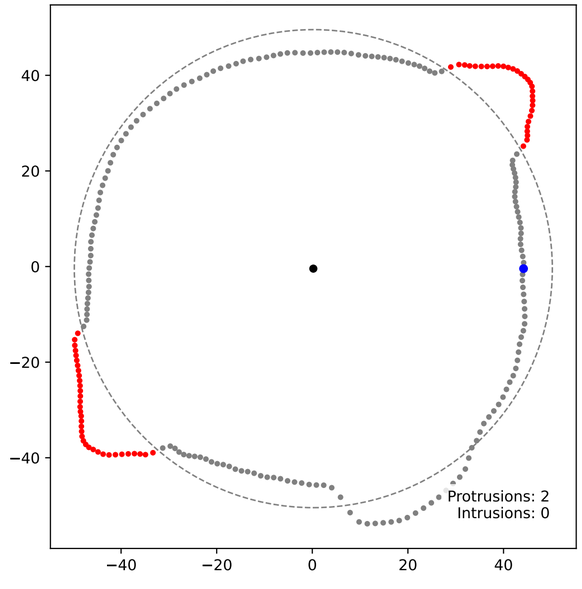

Shape evolution (t = 157.00)
Riemann Velocity: 0.1730
Max curvature: 0.0171
200
180
160
140
120
100
440
460
480
500

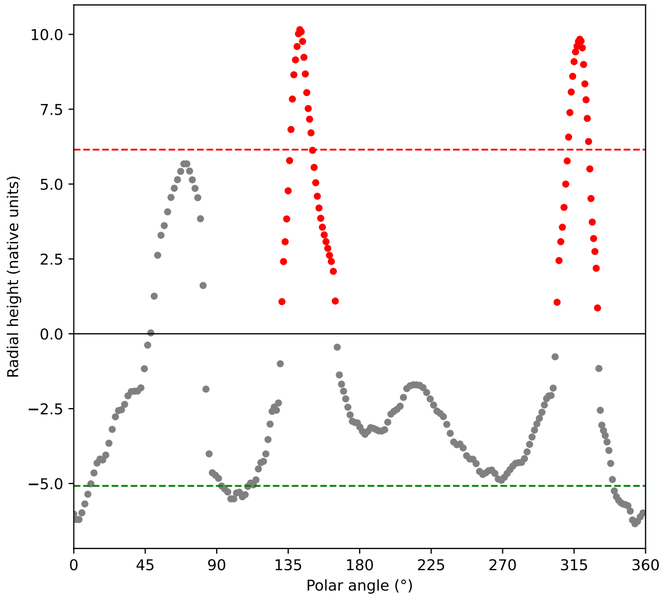

Topographical representation
Protrusions: 2
Intrusions: 0
40
20
0
−20
−40
−40
−20
0
20
40

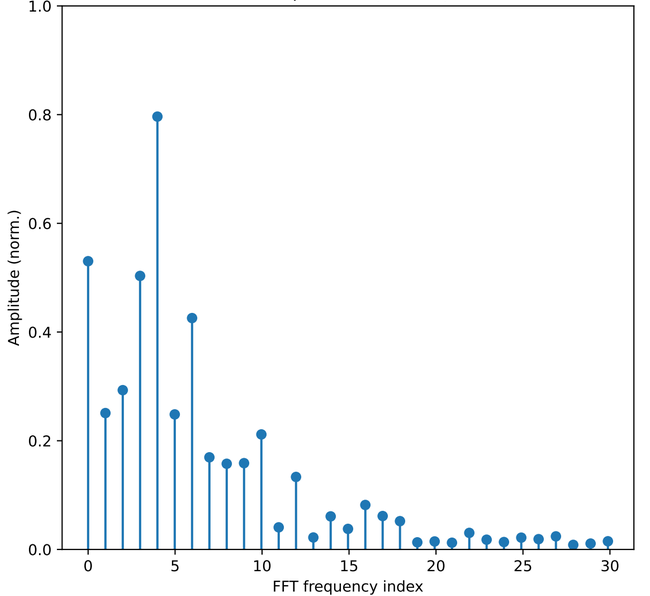

Topographical height
Radial height (native units)
Polar angle (°)
10
8
6
4
2
0
−2
−4
−6
0
45
90
135
180
225
270
315
360

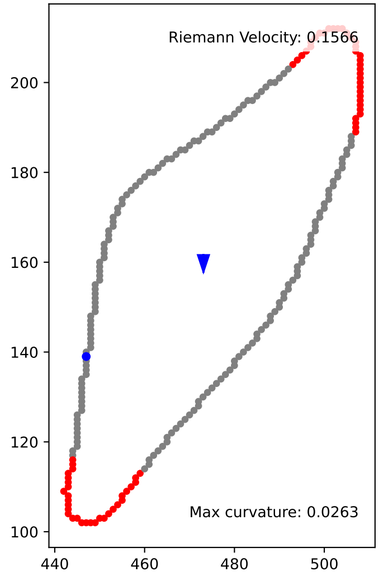

FFT spectrum (scatter)
Amplitude (norm.)
FFT frequency index
1.0
0.8
0.6
0.4
0.2
0.0
0
5
10
15
20
25
30

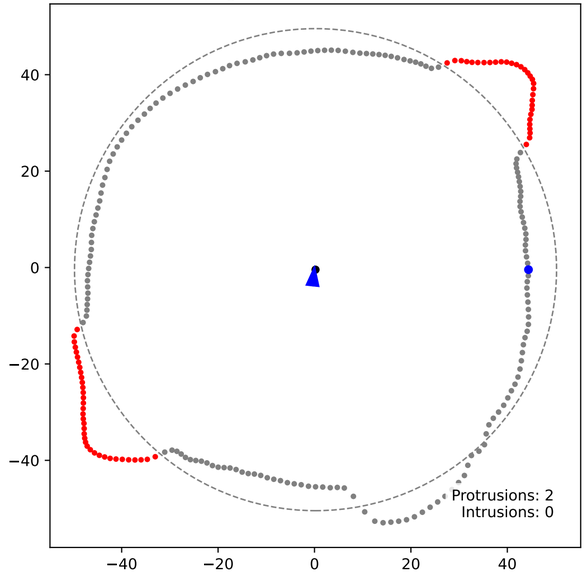

Shape evolution (t = 158.00)
Riemann Velocity: 0.1798
Max curvature: 0.0170
200
180
160
140
120
100
440
460
480
500

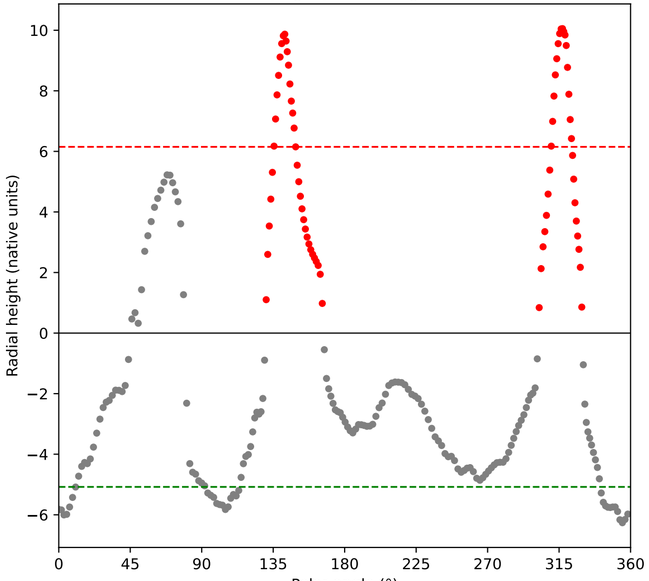

Topographical representation
Protrusions: 2
Intrusions: 0
40
20
0
−20
−40
−40
−20
0
20
40

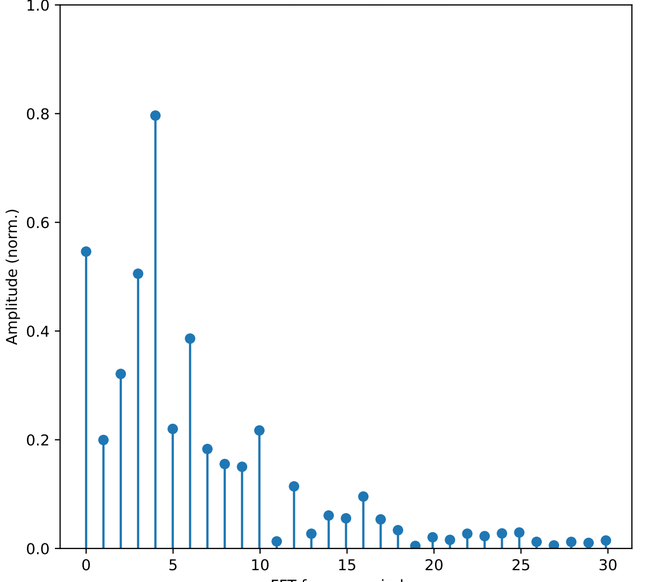

Topographical height
Radial height (native units)
Polar angle (°)
10.0
7.5
5.0
2.5
0.0
−2.5
−5.0
0
45
90
135
180
225
270
315
360

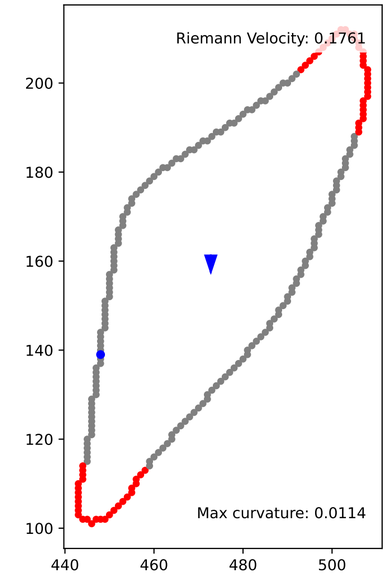

FFT spectrum (scatter)
Amplitude (norm.)
FFT frequency index
1.0
0.8
0.6
0.4
0.2
0.0
0
5
10
15
20
25
30

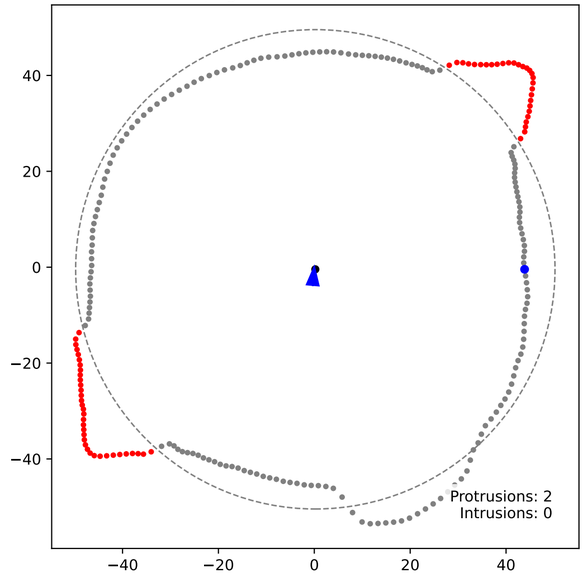

Shape evolution (t = 159.00)
Riemann Velocity: 0.1566
Max curvature: 0.0263
200
180
160
140
120
100
440
460
480
500

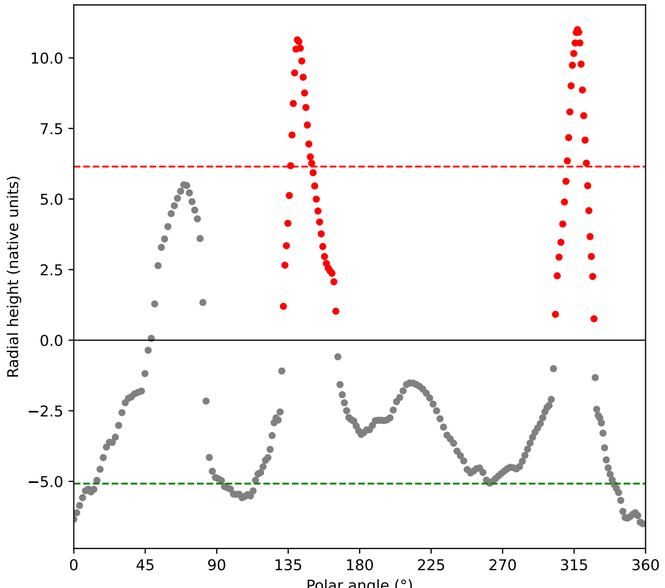

Topographical representation
Protrusions: 2
Intrusions: 0
40
20
0
−20
−40
−40
−20
0
20
40

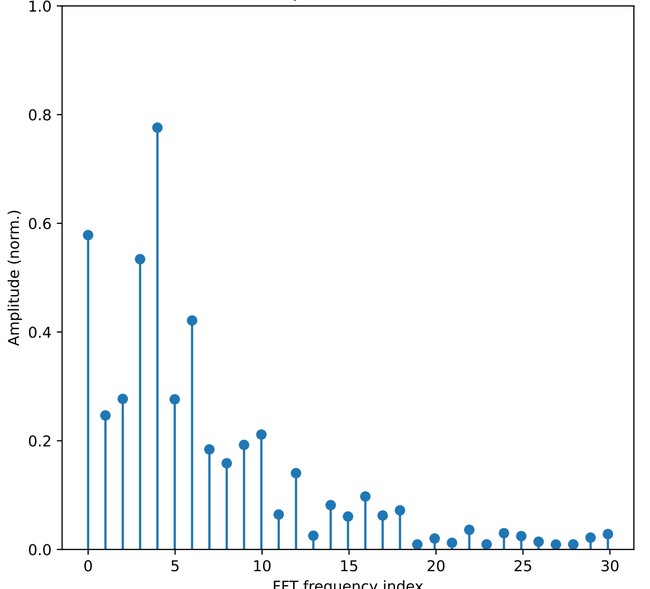

Topographical height
Radial height (native units)
Polar angle (°)
10
8
6
4
2
0
−2
−4
−6
0
45
90
135
180
225
270
315
360

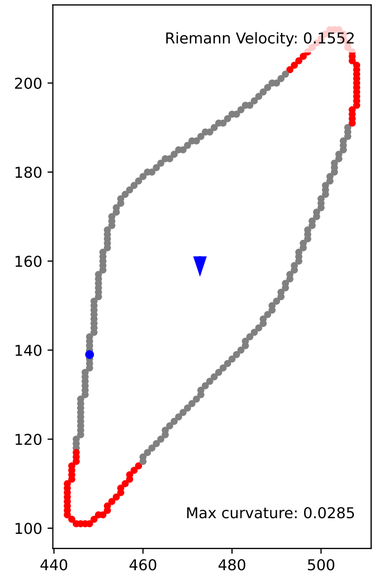

FFT spectrum (scatter)
Amplitude (norm.)
FFT frequency index
1.0
0.8
0.6
0.4
0.2
0.0
0
5
10
15
20
25
30

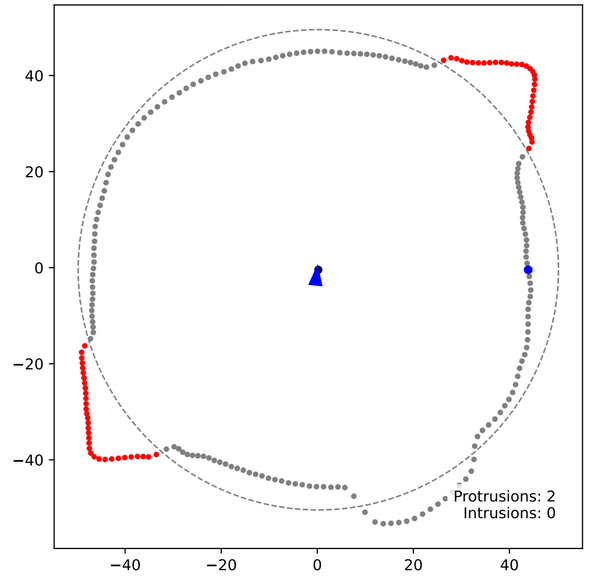

Shape evolution (t = 160.00)
Riemann Velocity: 0.1761
Max curvature: 0.0114
200
180
160
140
120
100
440
460
480
500

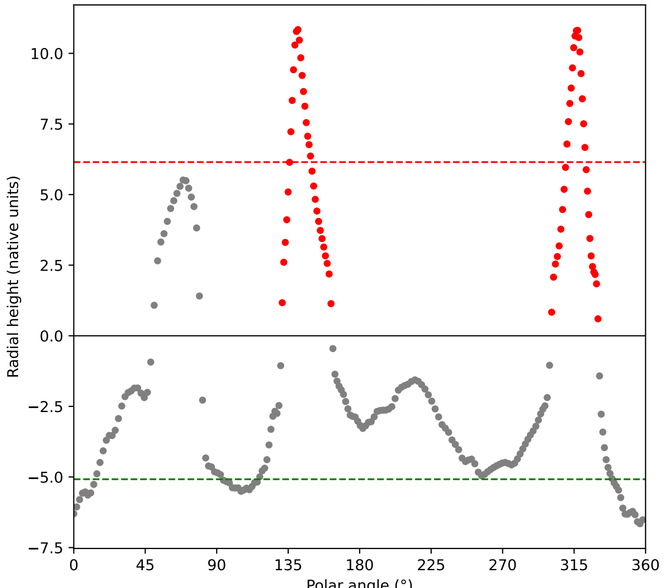

Topographical representation
Protrusions: 2
Intrusions: 0
40
20
0
−20
−40
−40
−20
0
20
40

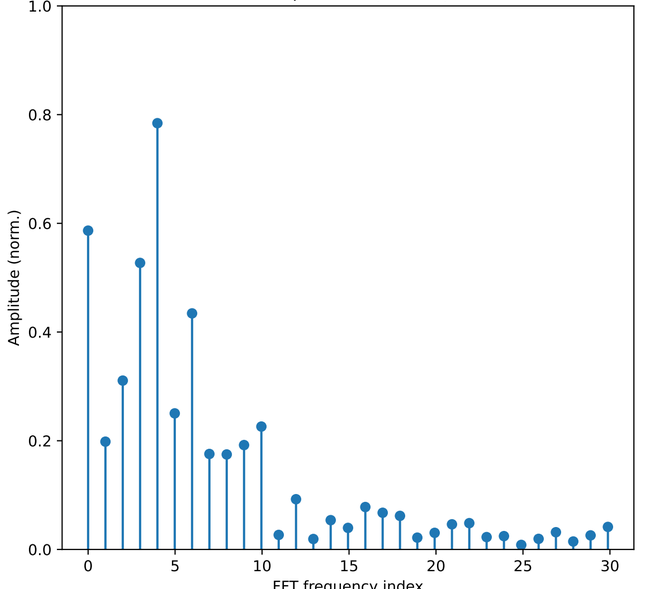

Topographical height
Radial height (native units)
Polar angle (°)
10.0
7.5
5.0
2.5
0.0
−2.5
−5.0
0
45
90
135
180
225
270
315
360

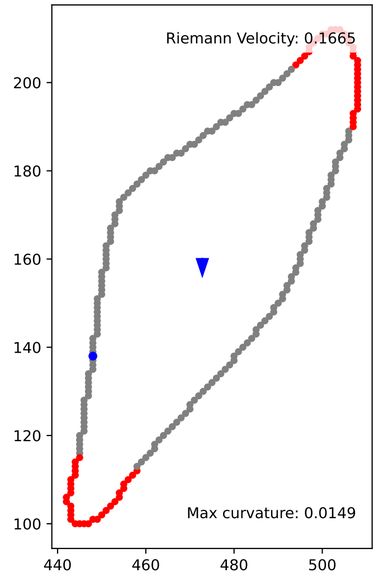

FFT spectrum (scatter)
Amplitude (norm.)
FFT frequency index
1.0
0.8
0.6
0.4
0.2
0.0
0
5
10
15
20
25
30

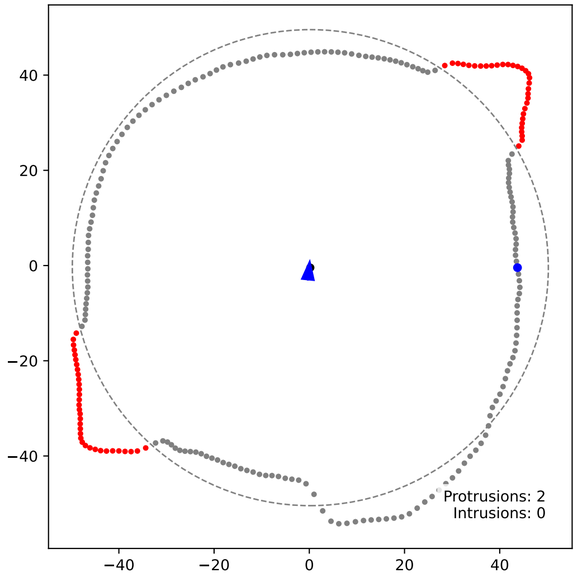

Shape evolution (t = 161.00)
Riemann Velocity: 0.1552
Max curvature: 0.0285
200
180
160
140
120
100
440
460
480
500

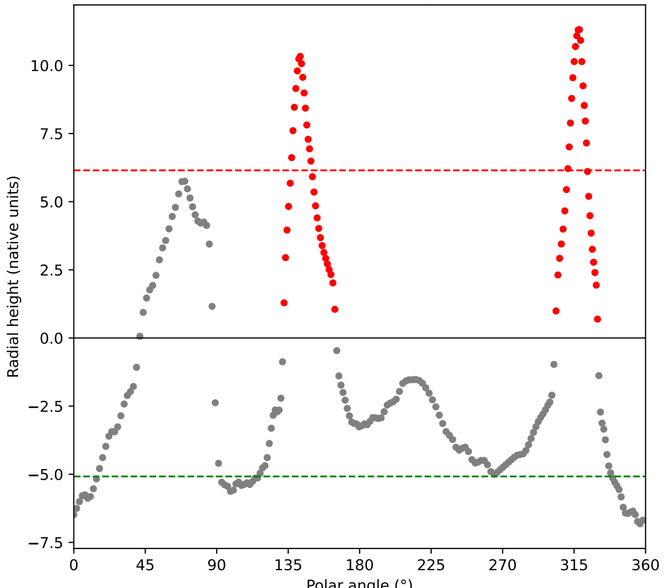

Topographical representation
Protrusions: 2
Intrusions: 0
40
20
0
−20
−40
−40
−20
0
20
40

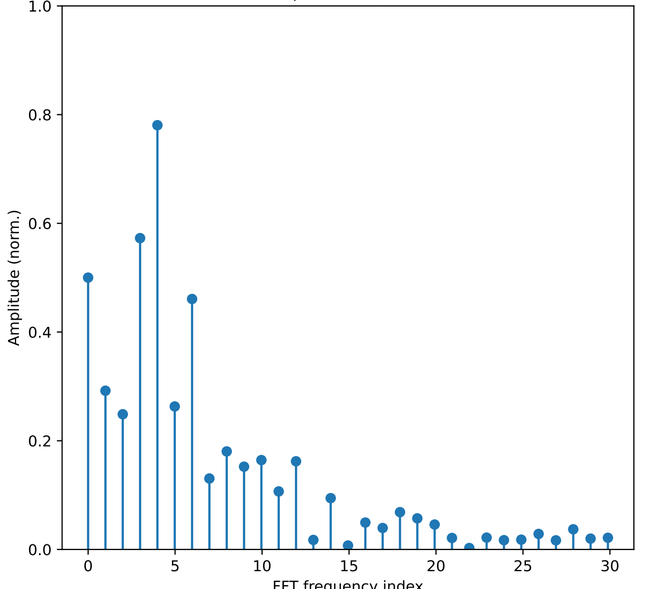

Topographical height
Radial height (native units)
Polar angle (°)
10.0
7.5
5.0
2.5
0.0
−2.5
−5.0
−7.5
0
45
90
135
180
225
270
315
360

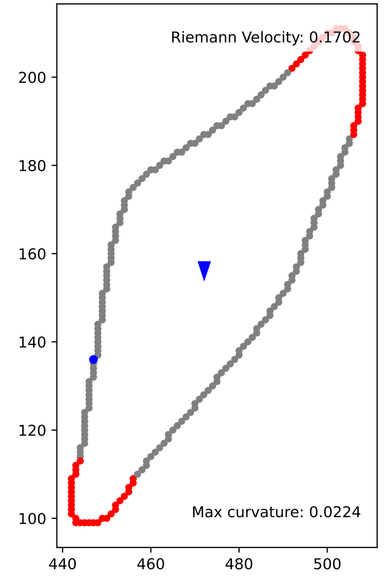

FFT spectrum (scatter)
Amplitude (norm.)
FFT frequency index
1.0
0.8
0.6
0.4
0.2
0.0
0
5
10
15
20
25
30

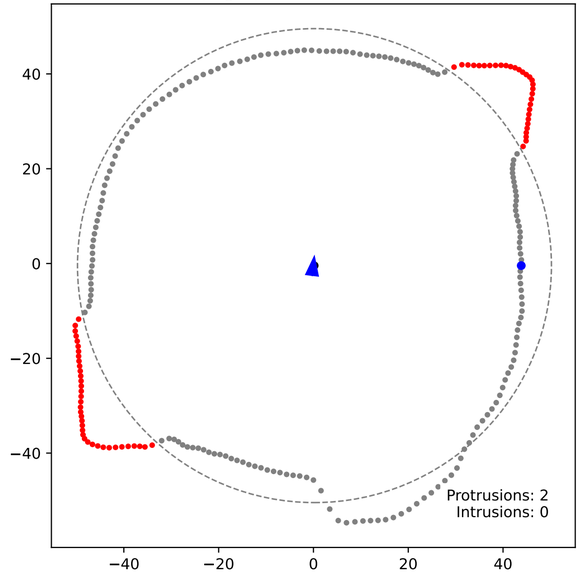

Shape evolution (t = 162.00)
Riemann Velocity: 0.1665
Max curvature: 0.0149
200
180
160
140
120
100
440
460
480
500

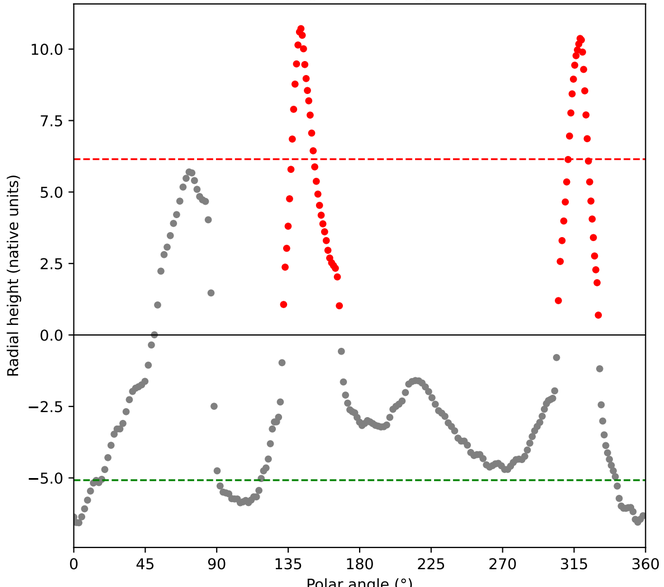

Topographical representation
Protrusions: 2
Intrusions: 0
40
20
0
−20
−40
−40
−20
0
20
40

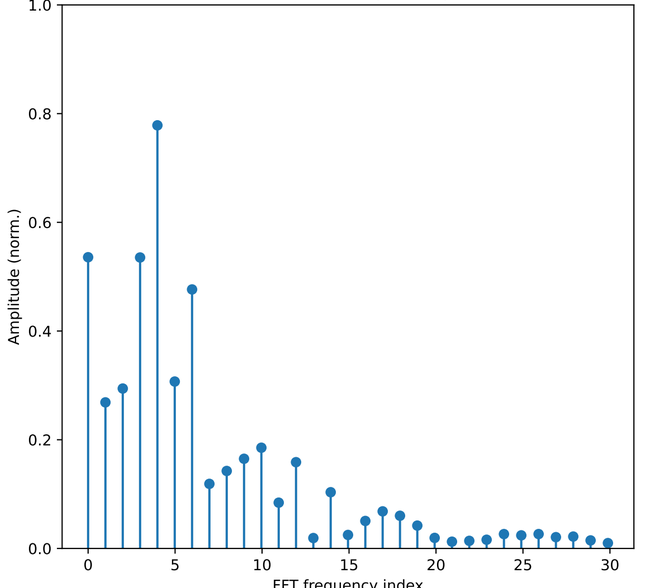

Topographical height
Radial height (native units)
Polar angle (°)
10.0
7.5
5.0
2.5
0.0
−2.5
−5.0
−7.5
0
45
90
135
180
225
270
315
360

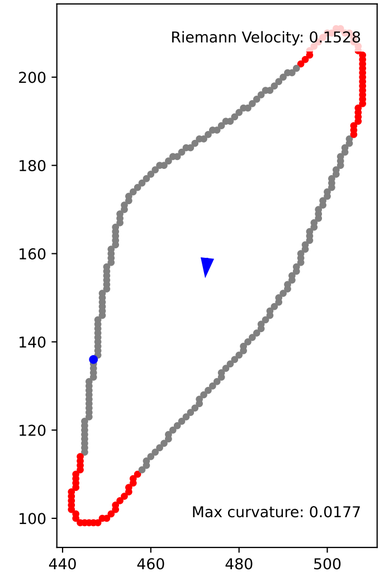

FFT spectrum (scatter)
Amplitude (norm.)
FFT frequency index
1.0
0.8
0.6
0.4
0.2
0.0
0
5
10
15
20
25
30

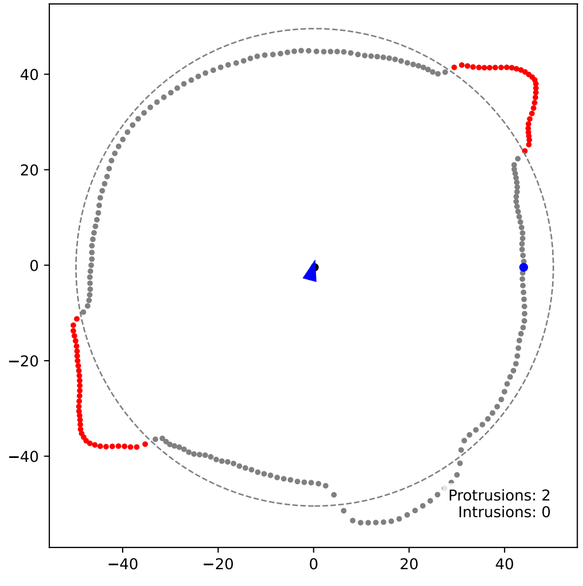

Shape evolution (t = 163.00)
Riemann Velocity: 0.1702
Max curvature: 0.0224
200
180
160
140
120
100
440
460
480
500

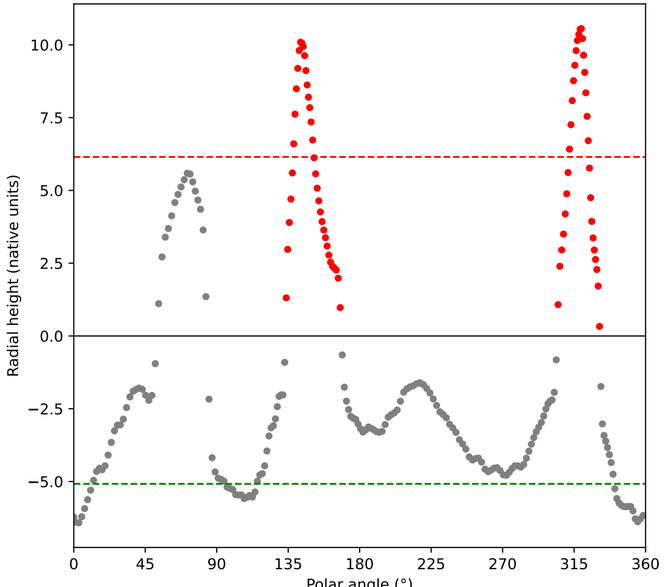

Topographical representation
Protrusions: 2
Intrusions: 0
40
20
0
−20
−40
−40
−20
0
20
40

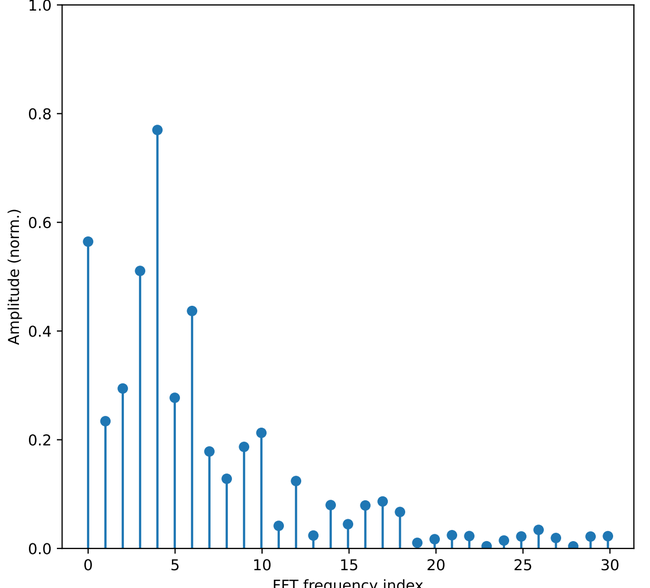

Topographical height
Radial height (native units)
Polar angle (°)
10.0
7.5
5.0
2.5
0.0
−2.5
−5.0
0
45
90
135
180
225
270
315
360

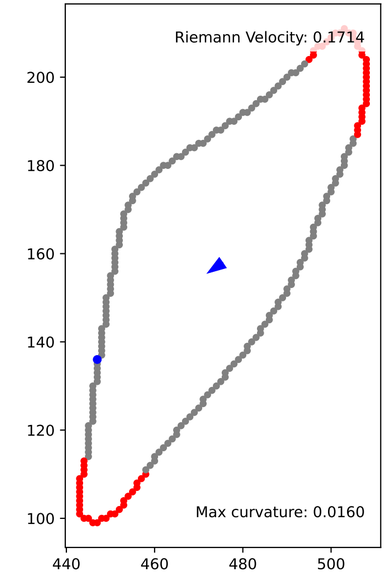

FFT spectrum (scatter)
Amplitude (norm.)
FFT frequency index
1.0
0.8
0.6
0.4
0.2
0.0
0
5
10
15
20
25
30

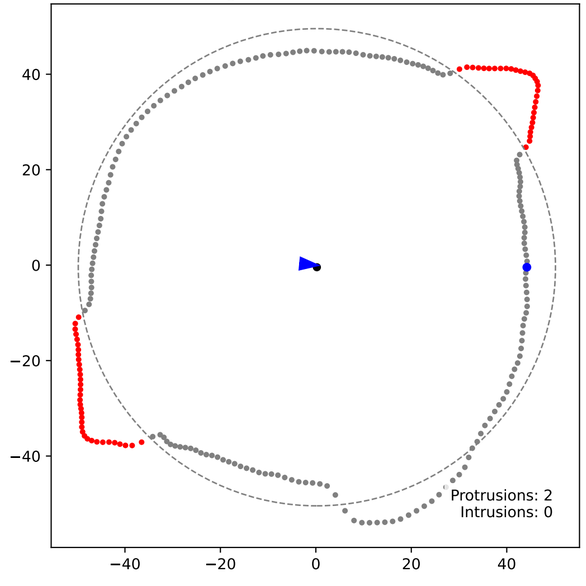

Shape evolution (t = 164.00)
Riemann Velocity: 0.1528
Max curvature: 0.0177
200
180
160
140
120
100
440
460
480
500

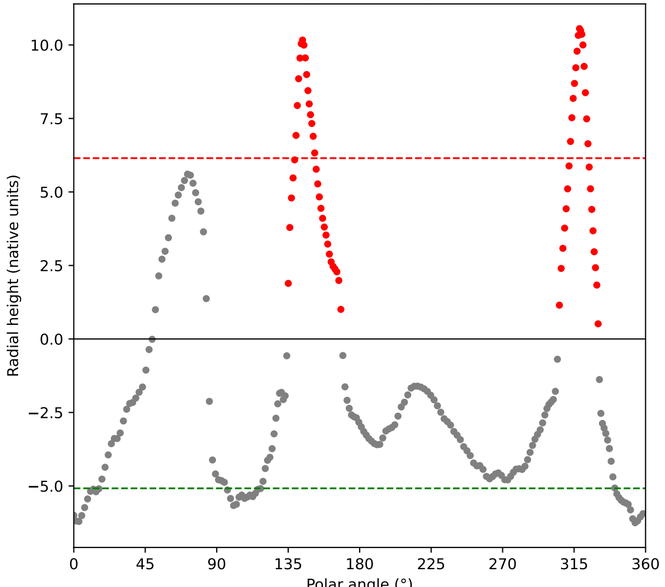

Topographical representation
Protrusions: 2
Intrusions: 0
40
20
0
−20
−40
−40
−20
0
20
40

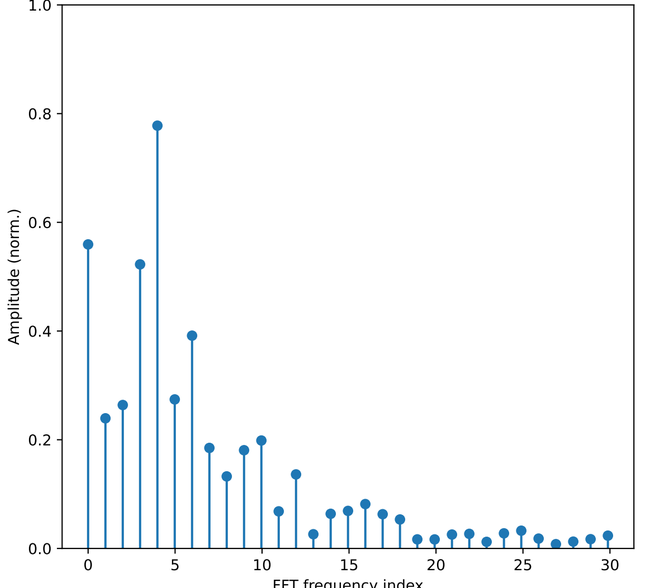

Topographical height
Radial height (native units)
Polar angle (°)
10.0
7.5
5.0
2.5
0.0
−2.5
−5.0
0
45
90
135
180
225
270
315
360

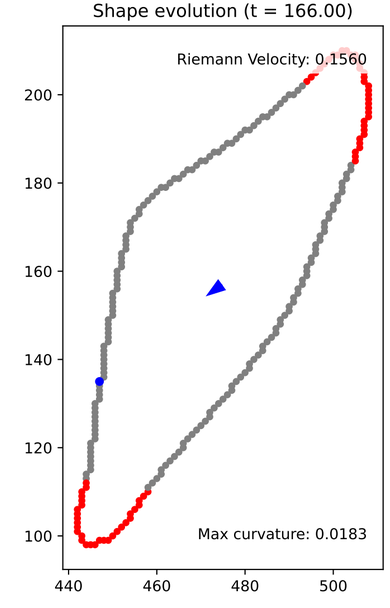

FFT spectrum (scatter)
Amplitude (norm.)
FFT frequency index
1.0
0.8
0.6
0.4
0.2
0.0
0
5
10
15
20
25
30

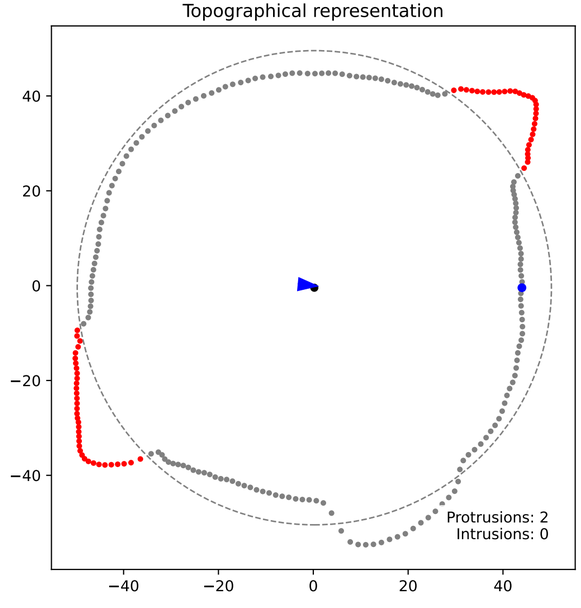

Shape evolution (t = 165.00)
Riemann Velocity: 0.1714
Max curvature: 0.0160
200
180
160
140
120
100
440
460
480
500

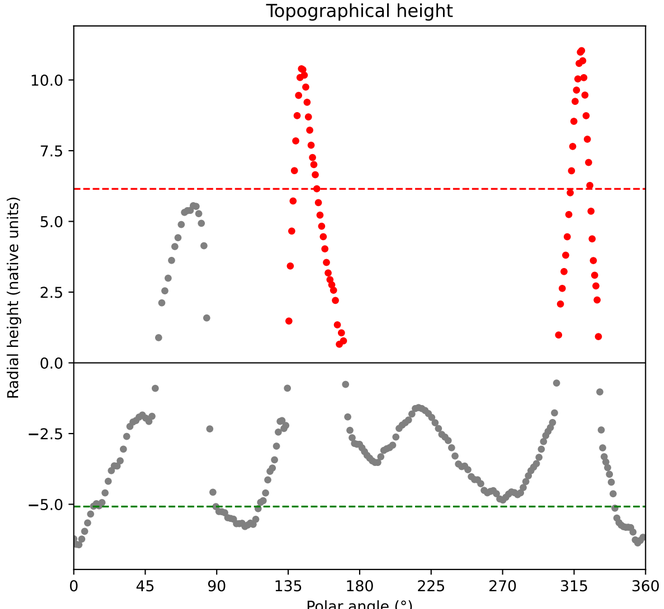

Topographical representation
Protrusions: 2
Intrusions: 0
40
20
0
−20
−40
−40
−20
0
20
40

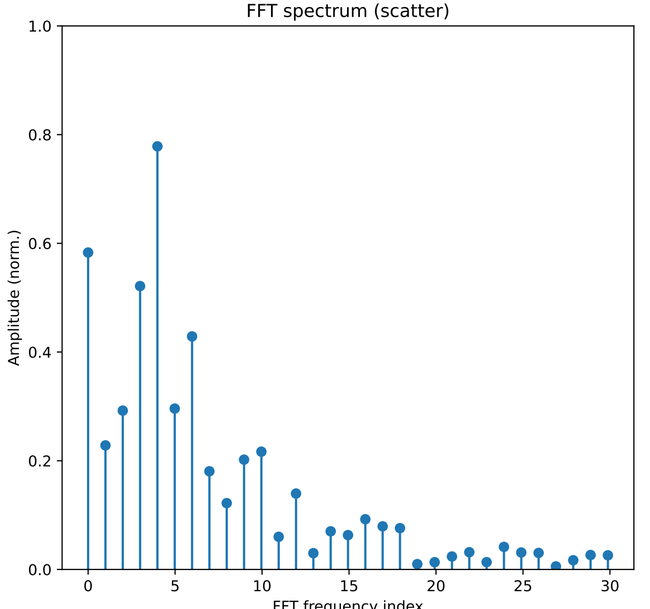

Topographical height
Radial height (native units)
Polar angle (°)
10.0
7.5
5.0
2.5
0.0
−2.5
−5.0
0
45
90
135
180
225
270
315
360

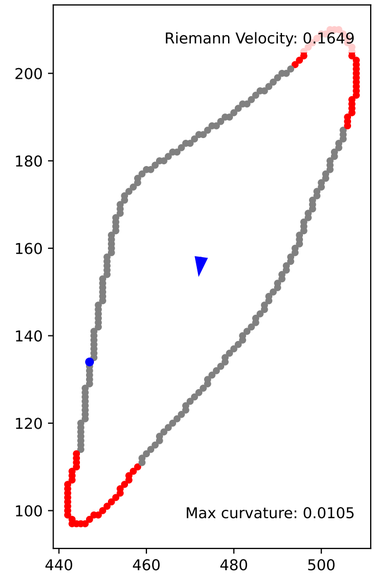

FFT spectrum (scatter)
Amplitude (norm.)
FFT frequency index
1.0
0.8
0.6
0.4
0.2
0.0
0
5
10
15
20
25
30

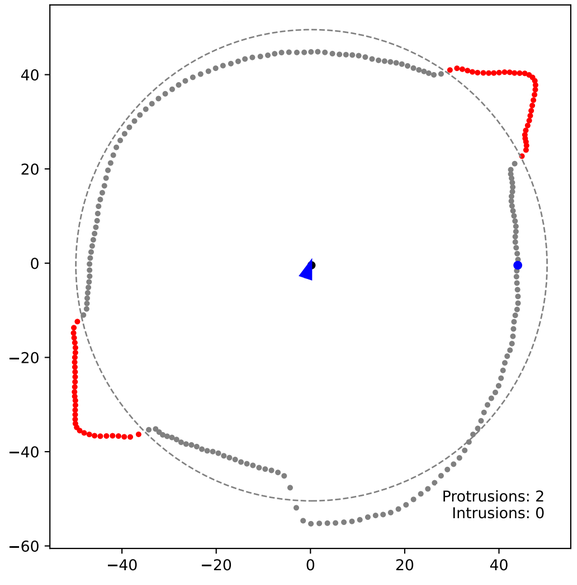

Shape evolution (t = 166.00)
Riemann Velocity: 0.1560
Max curvature: 0.0183
200
180
160
140
120
100
440
460
480
500

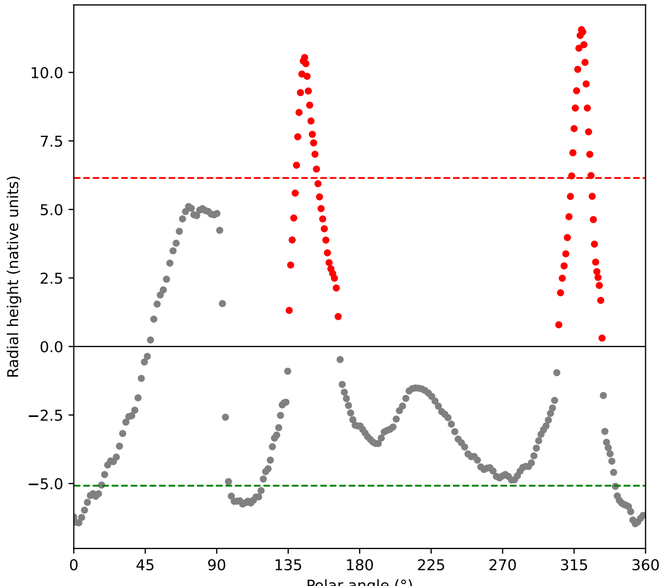

Topographical representation
Protrusions: 2
Intrusions: 0
40
20
0
−20
−40
−40
−20
0
20
40

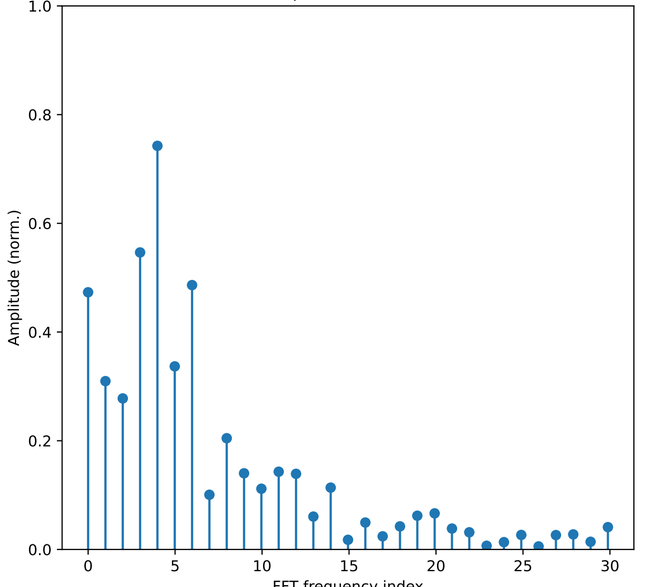

Topographical height
Radial height (native units)
Polar angle (°)
10.0
7.5
5.0
2.5
0.0
−2.5
−5.0
0
45
90
135
180
225
270
315
360

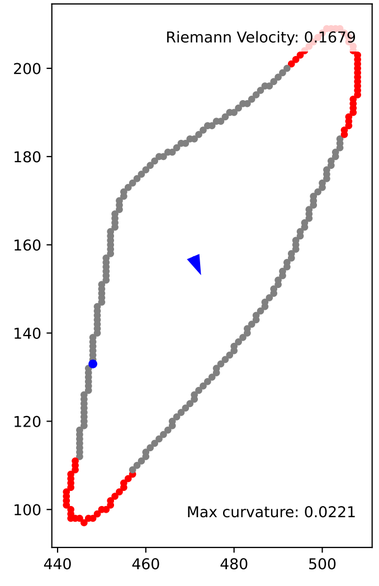

FFT spectrum (scatter)
Amplitude (norm.)
FFT frequency index
1.0
0.8
0.6
0.4
0.2
0.0
0
5
10
15
20
25
30

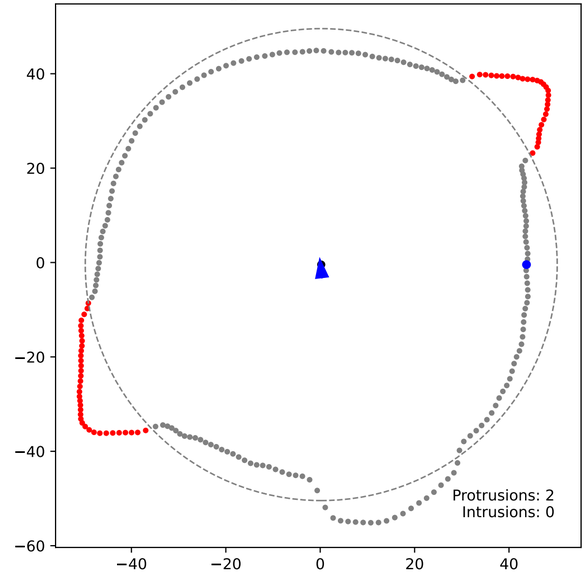

Shape evolution (t = 167.00)
Riemann Velocity: 0.1649
Max curvature: 0.0105
200
180
160
140
120
100
440
460
480
500

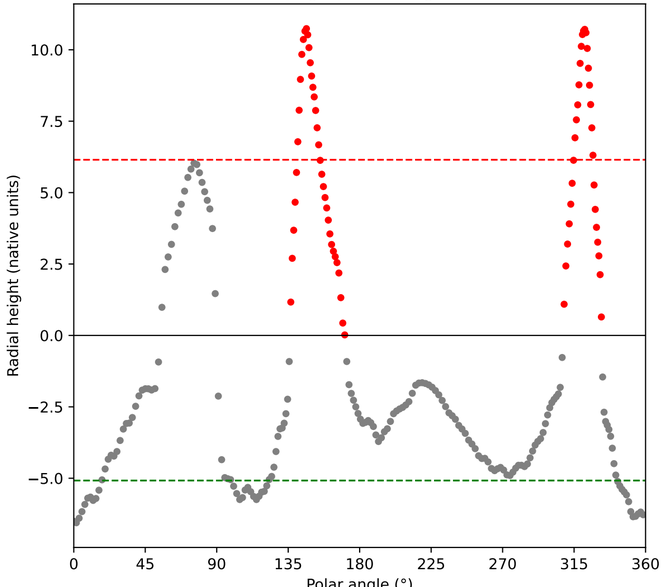

Topographical representation
Protrusions: 2
Intrusions: 0
40
20
0
−20
−40
−60
−40
−20
0
20
40

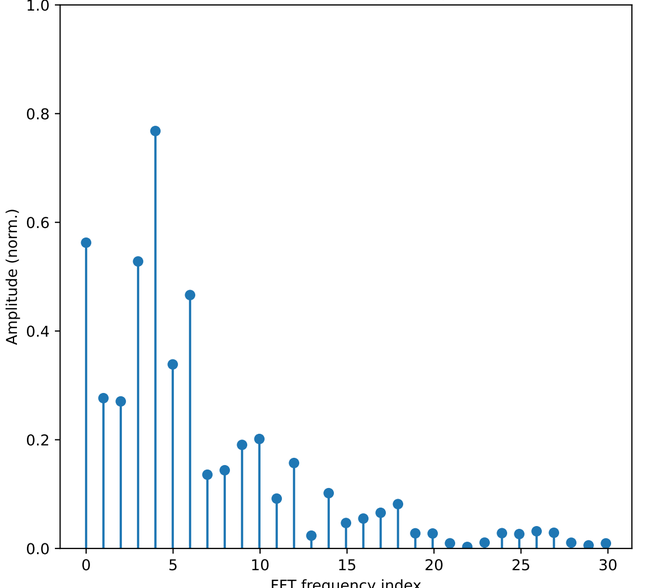

Topographical height
Radial height (native units)
Polar angle (°)
10.0
7.5
5.0
2.5
0.0
−2.5
−5.0
0
45
90
135
180
225
270
315
360

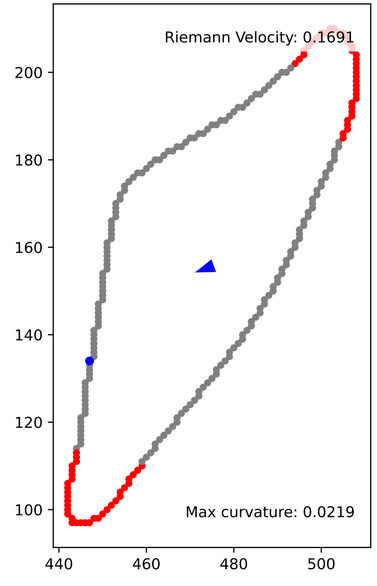

FFT spectrum (scatter)
Amplitude (norm.)
FFT frequency index
1.0
0.8
0.6
0.4
0.2
0.0
0
5
10
15
20
25
30

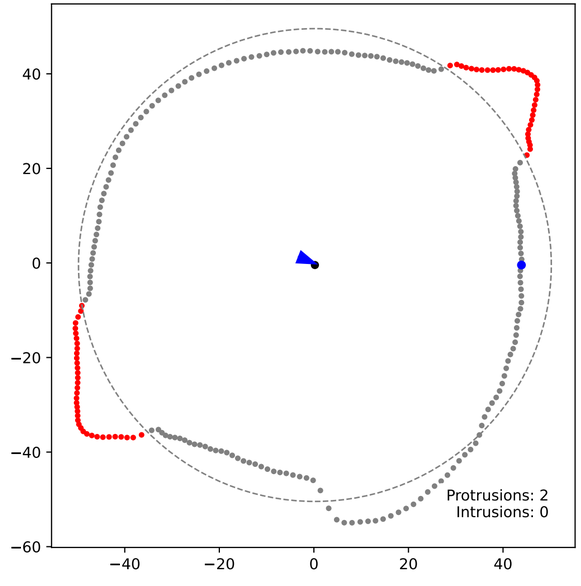

Shape evolution (t = 168.00)
Riemann Velocity: 0.1679
Max curvature: 0.0221
200
180
160
140
120
100
440
460
480
500

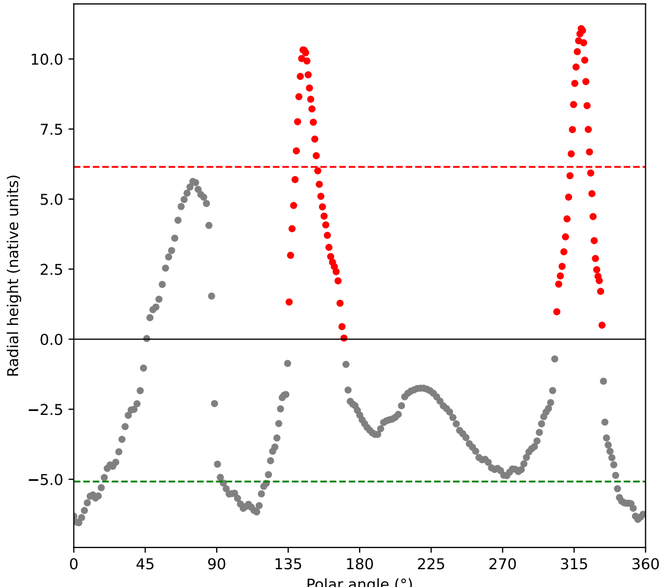

Topographical representation
Protrusions: 2
Intrusions: 0
40
20
0
−20
−40
−60
−40
−20
0
20
40

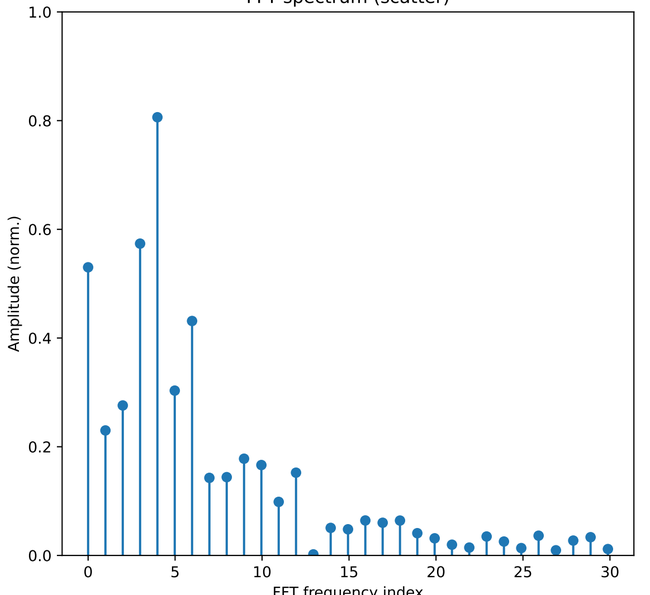

Topographical height
Radial height (native units)
Polar angle (°)
10.0
7.5
5.0
2.5
0.0
−2.5
−5.0
0
45
90
135
180
225
270
315
360

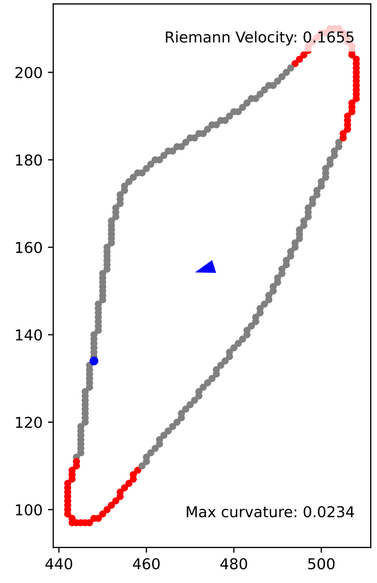

FFT spectrum (scatter)
Amplitude (norm.)
FFT frequency index
1.0
0.8
0.6
0.4
0.2
0.0
0
5
10
15
20
25
30

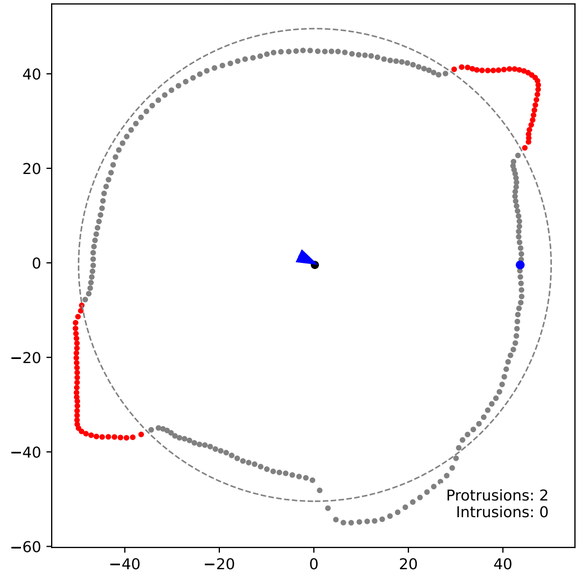

Shape evolution (t = 169.00)
Riemann Velocity: 0.1691
Max curvature: 0.0219
200
180
160
140
120
100
440
460
480
500

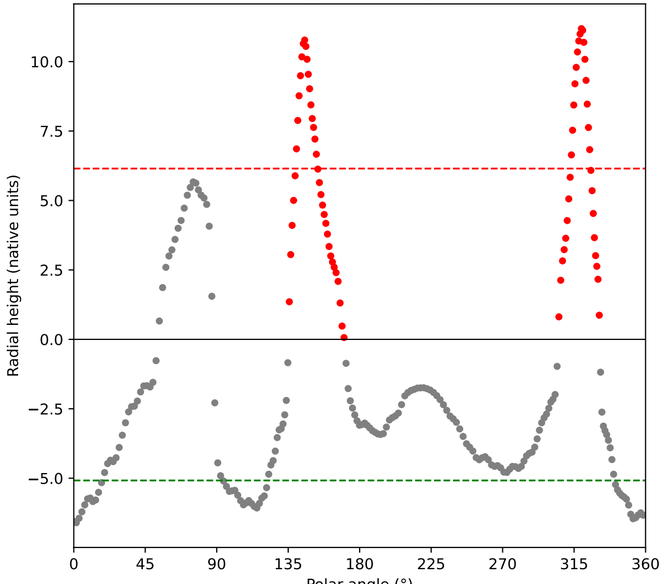

Topographical representation
Protrusions: 2
Intrusions: 0
40
20
0
−20
−40
−60
−40
−20
0
20
40

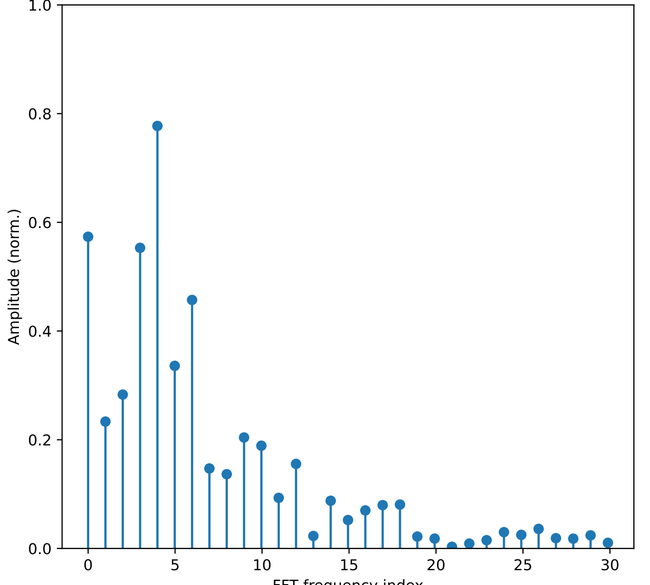

Topographical height
Radial height (native units)
Polar angle (°)
10.0
7.5
5.0
2.5
0.0
−2.5
−5.0
0
45
90
135
180
225
270
315
360

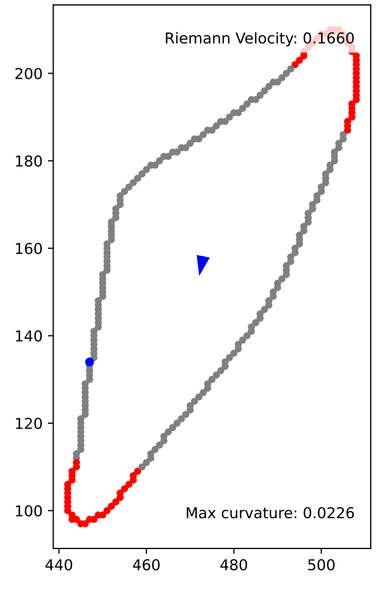

FFT spectrum (scatter)
Amplitude (norm.)
FFT frequency index
1.0
0.8
0.6
0.4
0.2
0.0
0
5
10
15
20
25
30

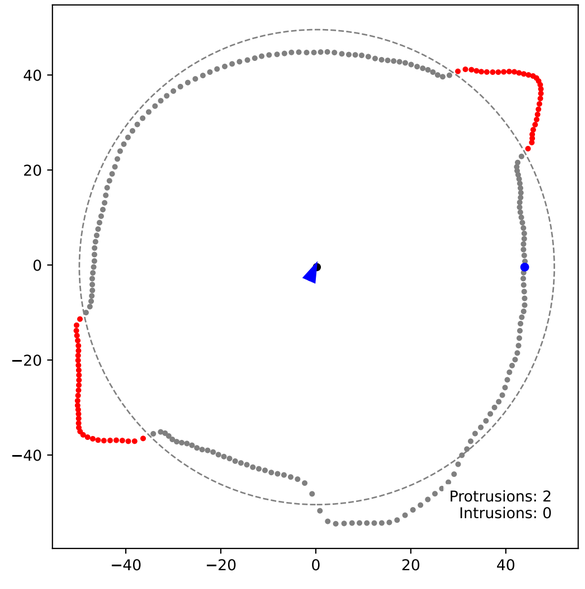

Shape evolution (t = 170.00)
Riemann Velocity: 0.1655
Max curvature: 0.0234
200
180
160
140
120
100
440
460
480
500

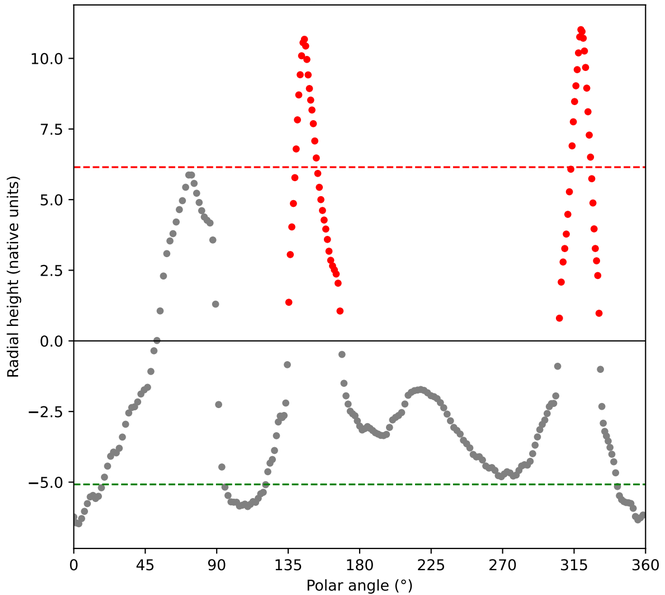

Topographical representation
Protrusions: 2
Intrusions: 0
40
20
0
−20
−40
−60
−40
−20
0
20
40

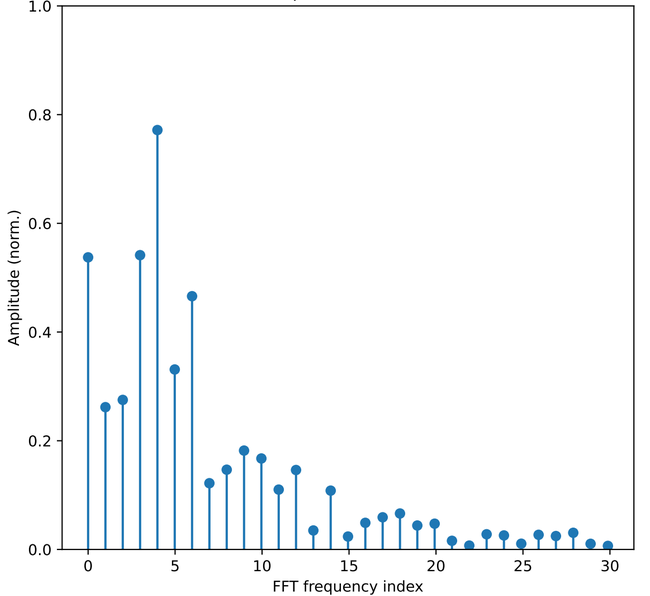

Topographical height
Radial height (native units)
Polar angle (°)
10.0
7.5
5.0
2.5
0.0
−2.5
−5.0
0
45
90
135
180
225
270
315
360

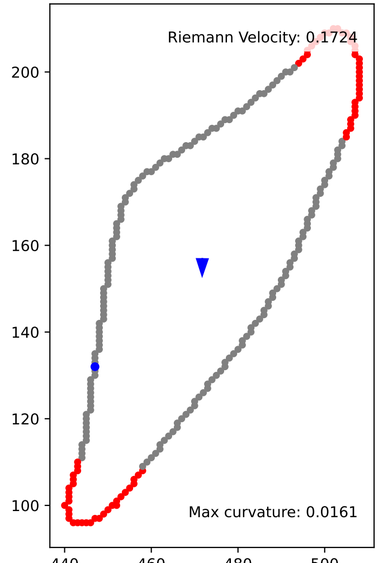

FFT spectrum (scatter)
Amplitude (norm.)
FFT frequency index
1.0
0.8
0.6
0.4
0.2
0.0
0
5
10
15
20
25
30

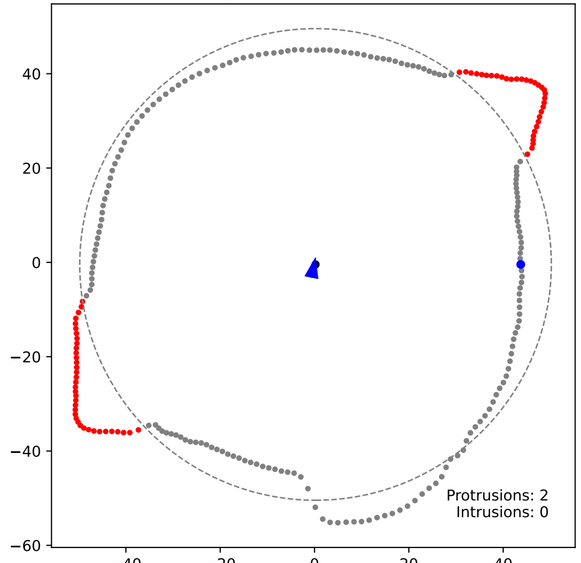

Shape evolution (t = 171.00)
Riemann Velocity: 0.1660
Max curvature: 0.0226
200
180
160
140
120
100
440
460
480
500

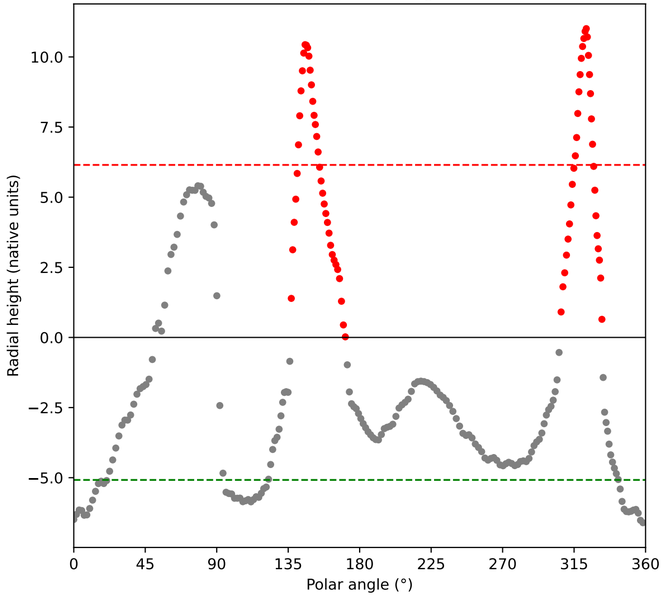

Topographical representation
Protrusions: 2
Intrusions: 0
40
20
0
−20
−40
−40
−20
0
20
40

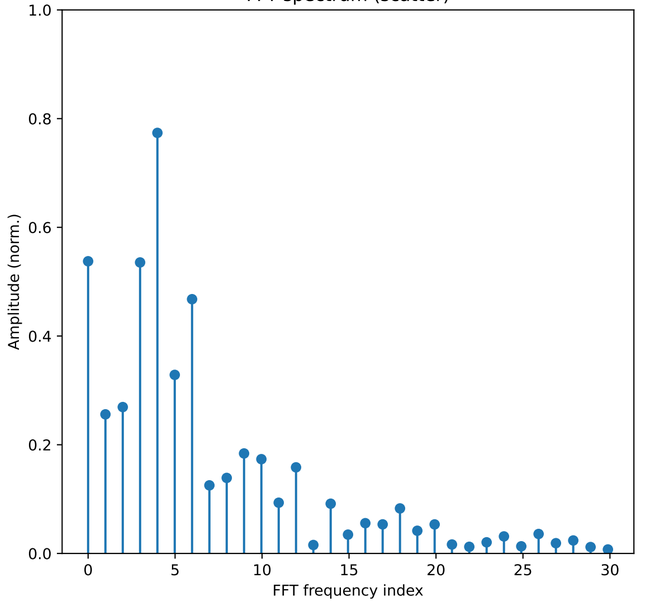

Topographical height
Radial height (native units)
Polar angle (°)
10.0
7.5
5.0
2.5
0.0
−2.5
−5.0
0
45
90
135
180
225
270
315
360

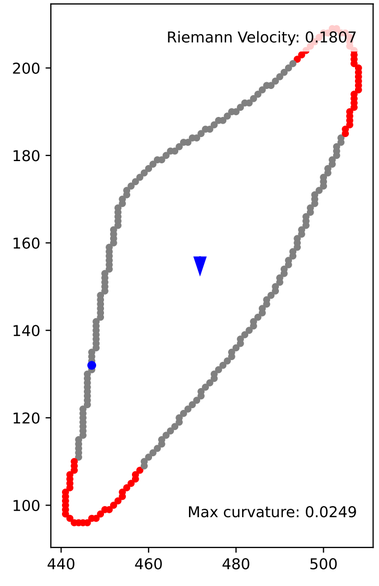

FFT spectrum (scatter)
Amplitude (norm.)
FFT frequency index
1.0
0.8
0.6
0.4
0.2
0.0
0
5
10
15
20
25
30

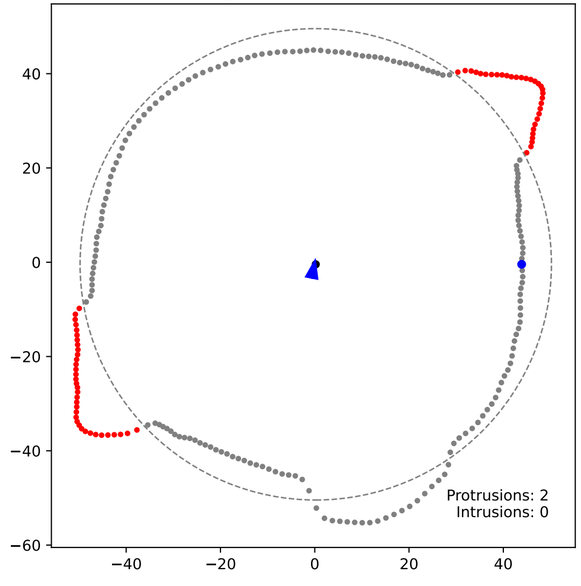

Shape evolution (t = 172.00)
Riemann Velocity: 0.1724
Max curvature: 0.0161
200
180
160
140
120
100
440
460
480
500

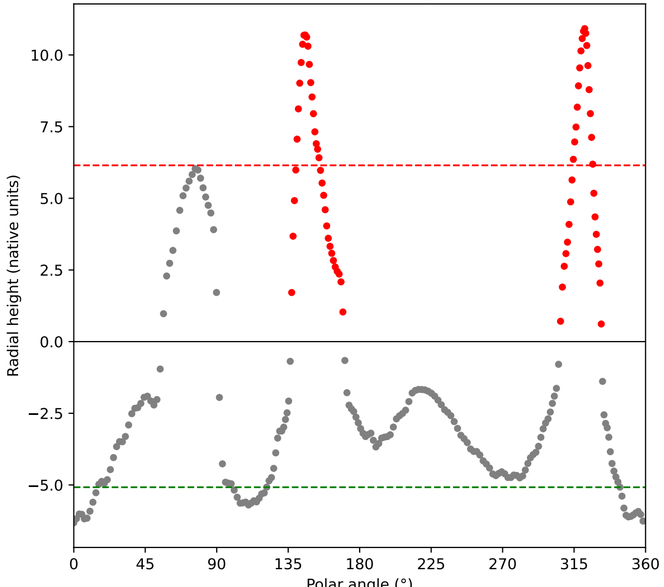

Topographical representation
Protrusions: 2
Intrusions: 0
40
20
0
−20
−40
−60
−40
−20
0
20
40

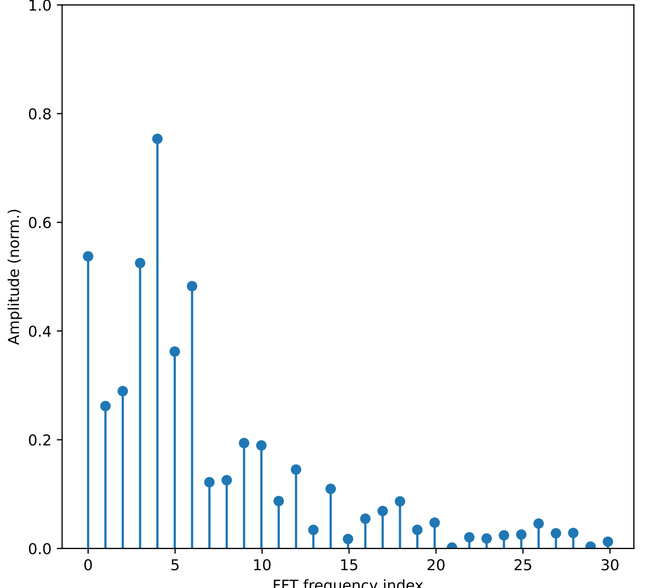

Topographical height
Radial height (native units)
Polar angle (°)
10.0
7.5
5.0
2.5
0.0
−2.5
−5.0
0
45
90
135
180
225
270
315
360

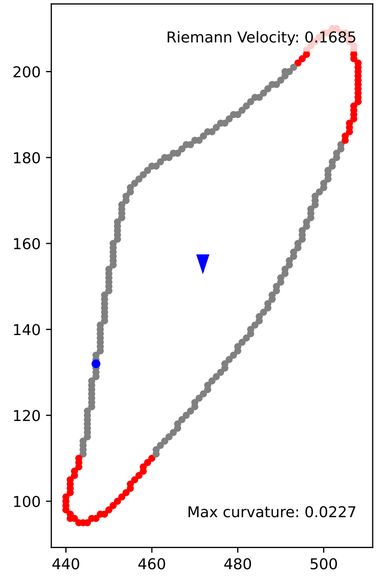

FFT spectrum (scatter)
Amplitude (norm.)
FFT frequency index
1.0
0.8
0.6
0.4
0.2
0.0
0
5
10
15
20
25
30

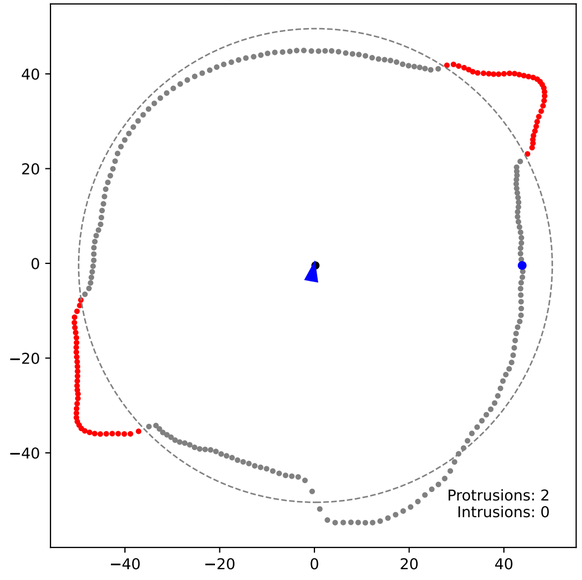

Shape evolution (t = 173.00)
Riemann Velocity: 0.1807
Max curvature: 0.0249
200
180
160
140
120
100
440
460
480
500

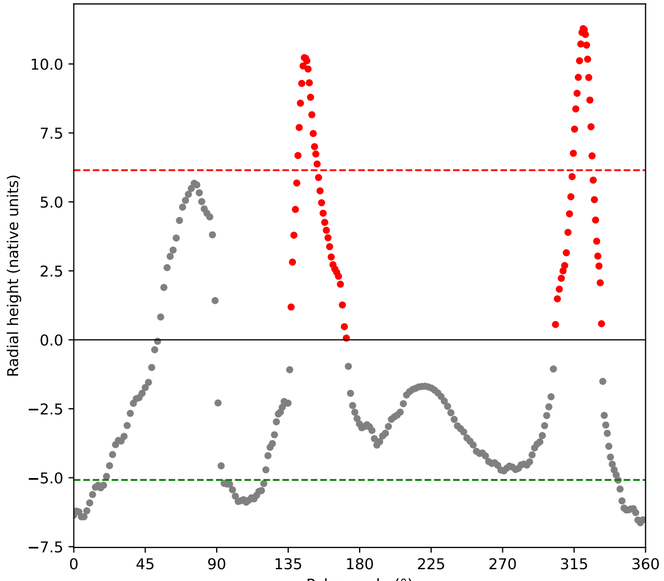

Topographical representation
Protrusions: 2
Intrusions: 0
40
20
0
−20
−40
−60
−40
−20
0
20
40

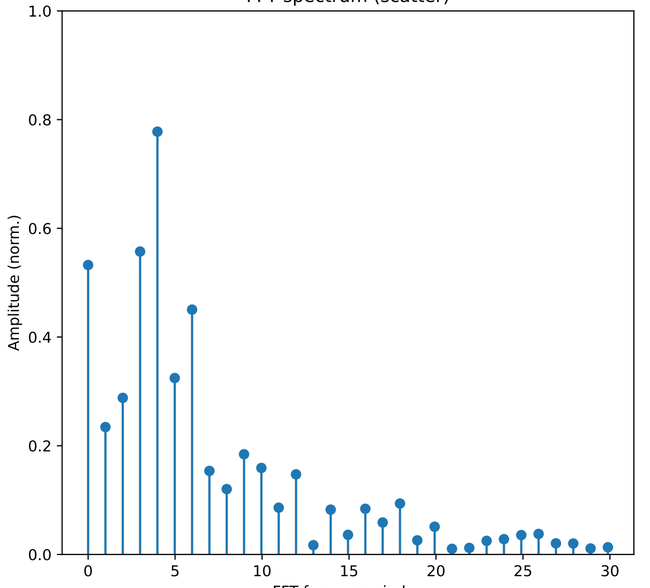

Topographical height
Radial height (native units)
Polar angle (°)
10.0
7.5
5.0
2.5
0.0
−2.5
−5.0
0
45
90
135
180
225
270
315
360

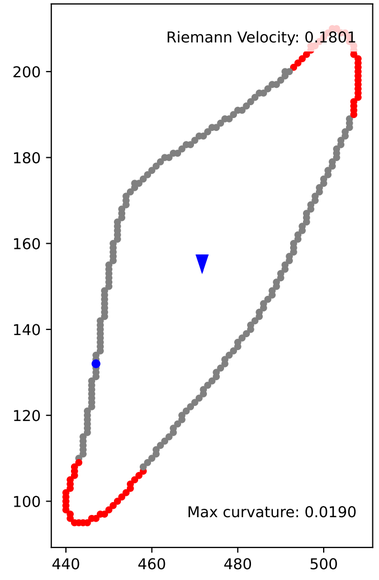

FFT spectrum (scatter)
Amplitude (norm.)
FFT frequency index
1.0
0.8
0.6
0.4
0.2
0.0
0
5
10
15
20
25
30

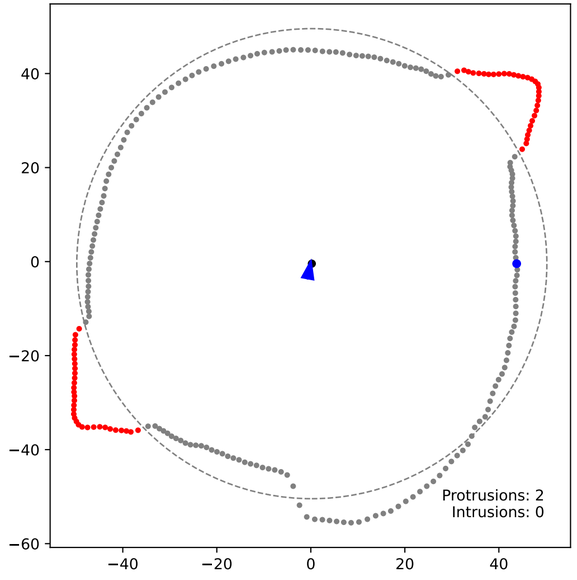

Shape evolution (t = 174.00)
Riemann Velocity: 0.1685
Max curvature: 0.0227
200
180
160
140
120
100
440
460
480
500

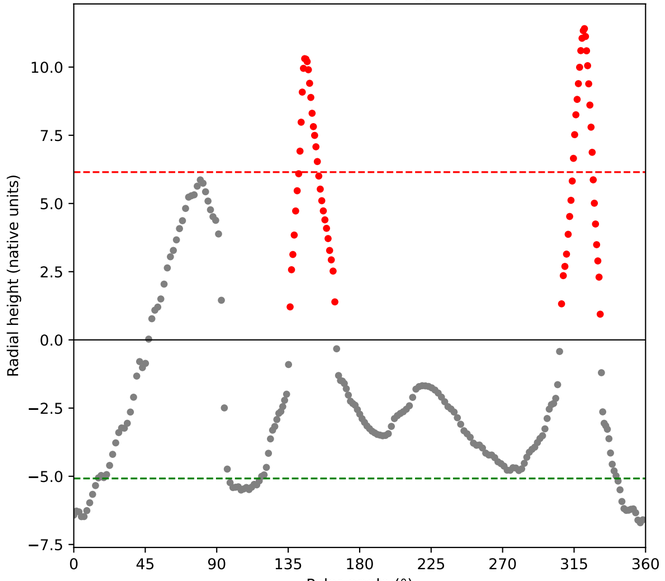

Topographical representation
Protrusions: 2
Intrusions: 0
40
20
0
−20
−40
−40
−20
0
20
40

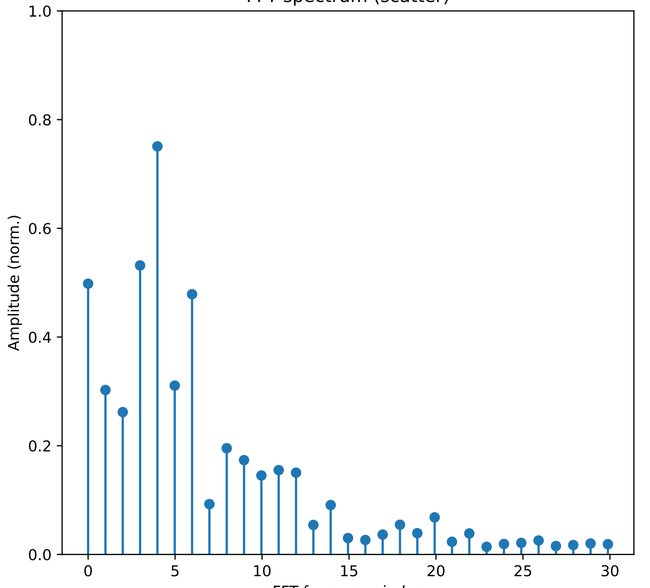

Topographical height
Radial height (native units)
Polar angle (°)
10.0
7.5
5.0
2.5
0.0
−2.5
−5.0
−7.5
0
45
90
135
180
225
270
315
360

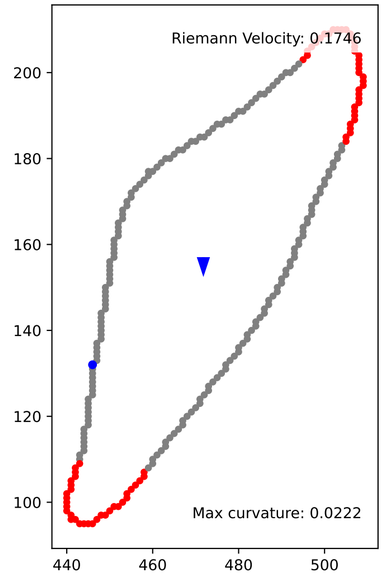

FFT spectrum (scatter)
Amplitude (norm.)
FFT frequency index
1.0
0.8
0.6
0.4
0.2
0.0
0
5
10
15
20
25
30

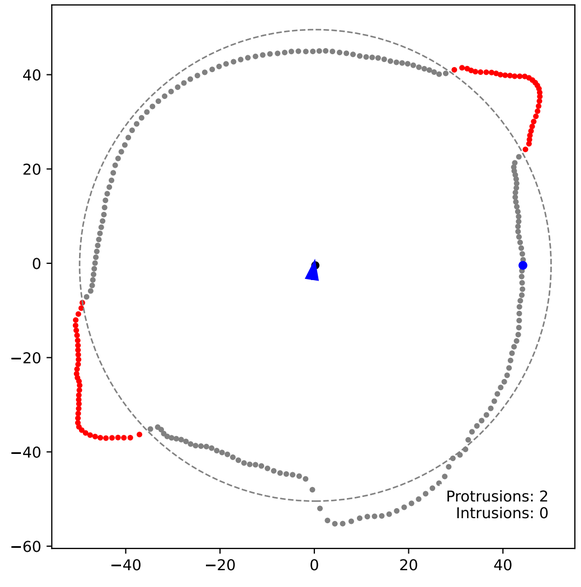

Shape evolution (t = 175.00)
Riemann Velocity: 0.1801
Max curvature: 0.0190
200
180
160
140
120
100
440
460
480
500

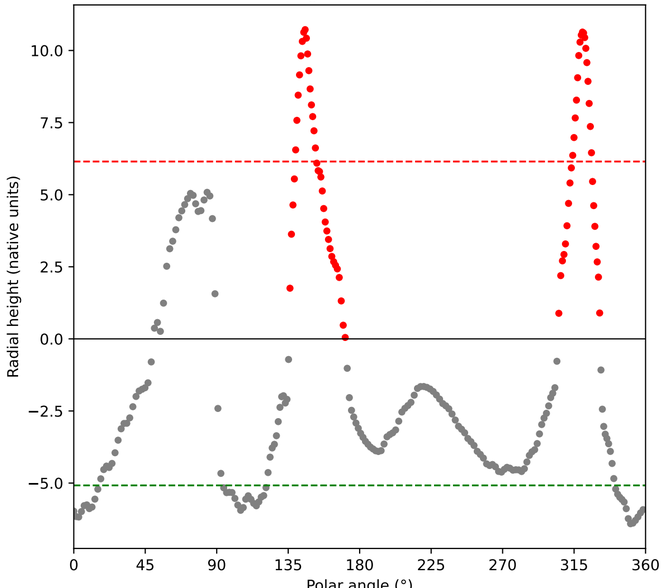

Topographical representation
Protrusions: 2
Intrusions: 0
40
20
0
−20
−40
−60
−40
−20
0
20
40

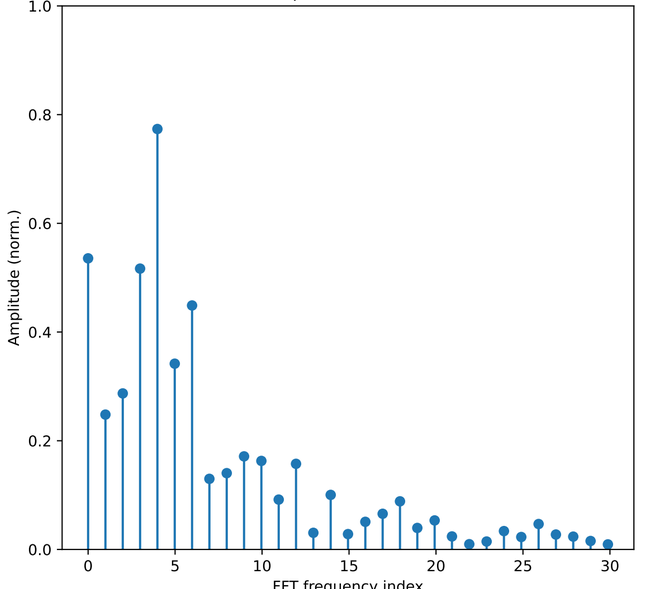

Topographical height
Radial height (native units)
Polar angle (°)
10.0
7.5
5.0
2.5
0.0
−2.5
−5.0
−7.5
0
45
90
135
180
225
270
315
360

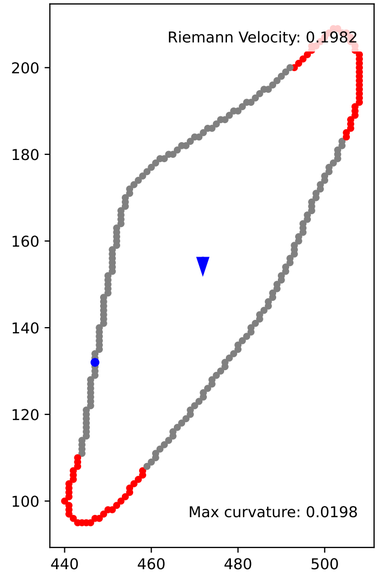

FFT spectrum (scatter)
Amplitude (norm.)
FFT frequency index
1.0
0.8
0.6
0.4
0.2
0.0
0
5
10
15
20
25
30

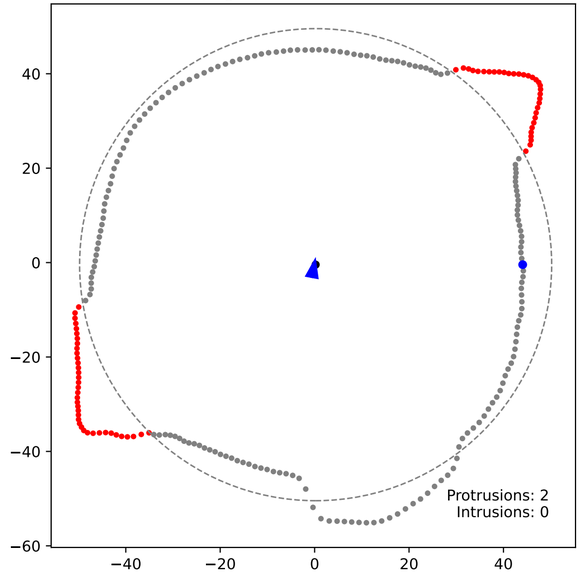

Shape evolution (t = 176.00)
Riemann Velocity: 0.1746
Max curvature: 0.0222
200
180
160
140
120
100
440
460
480
500

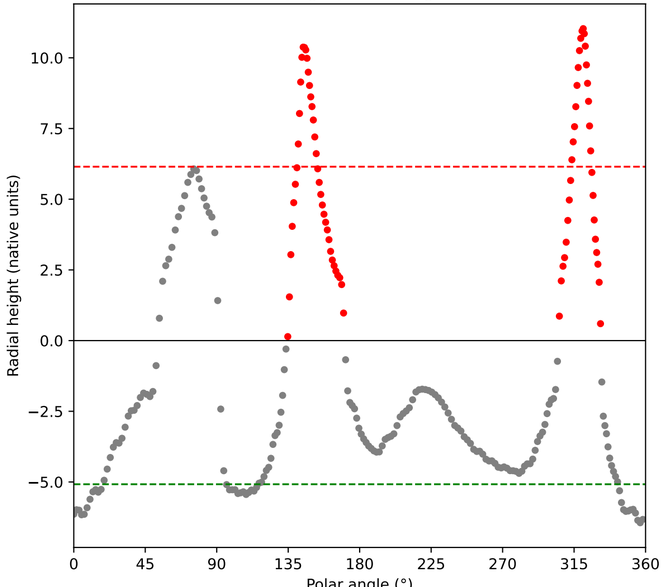

Topographical representation
Protrusions: 2
Intrusions: 0
40
20
0
−20
−40
−60
−40
−20
0
20
40

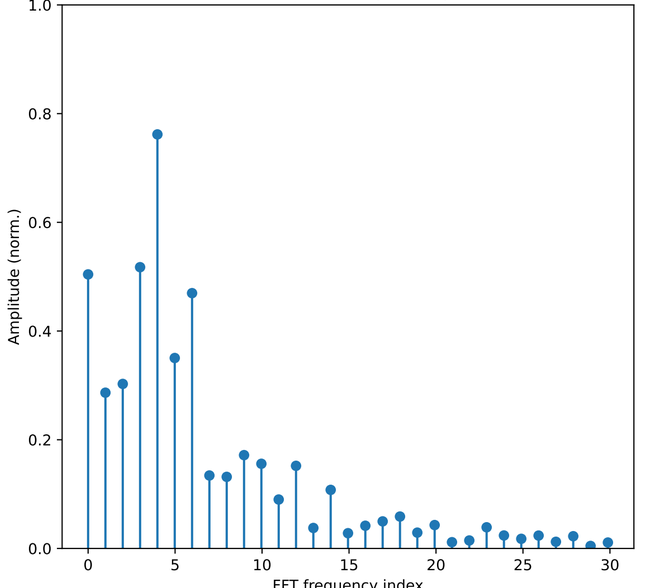

Topographical height
Radial height (native units)
Polar angle (°)
10.0
7.5
5.0
2.5
0.0
−2.5
−5.0
0
45
90
135
180
225
270
315
360

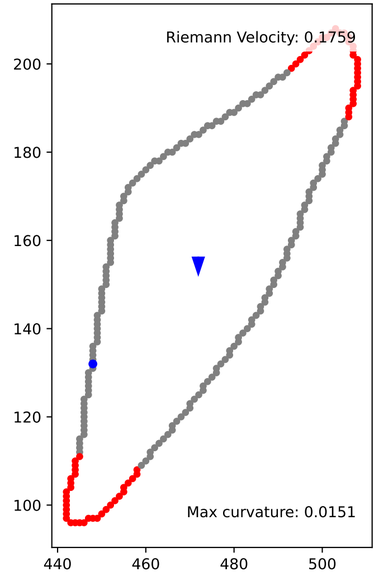

FFT spectrum (scatter)
Amplitude (norm.)
FFT frequency index
1.0
0.8
0.6
0.4
0.2
0.0
0
5
10
15
20
25
30

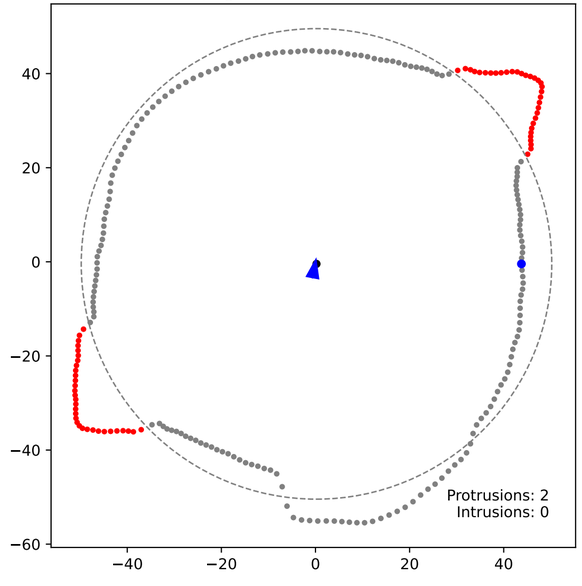

Shape evolution (t = 177.00)
Riemann Velocity: 0.1982
Max curvature: 0.0198
200
180
160
140
120
100
440
460
480
500

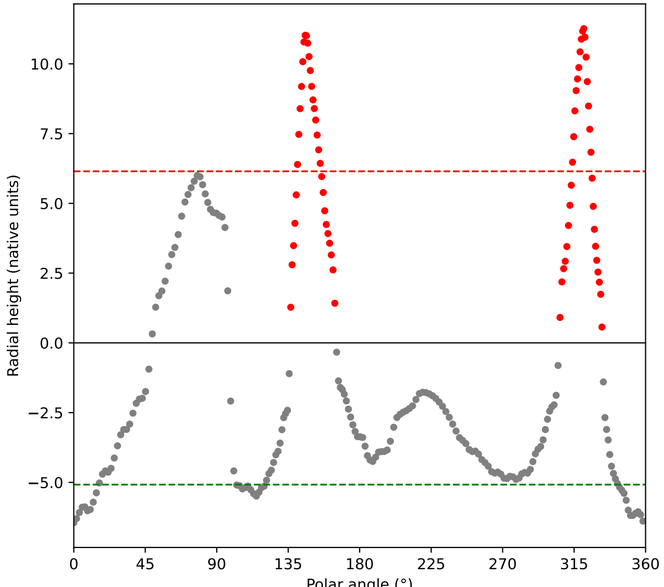

Topographical representation
Protrusions: 2
Intrusions: 0
40
20
0
−20
−40
−60
−40
−20
0
20
40

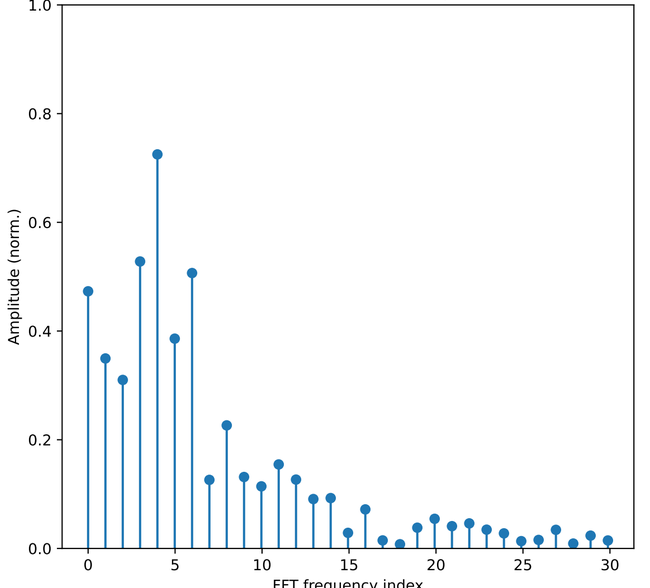

Topographical height
Radial height (native units)
Polar angle (°)
10.0
7.5
5.0
2.5
0.0
−2.5
−5.0
0
45
90
135
180
225
270
315
360

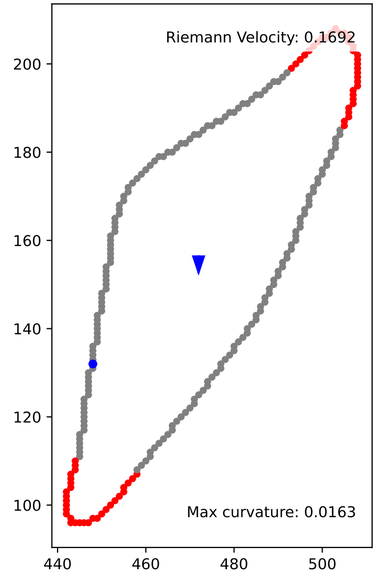

FFT spectrum (scatter)
Amplitude (norm.)
FFT frequency index
1.0
0.8
0.6
0.4
0.2
0.0
0
5
10
15
20
25
30

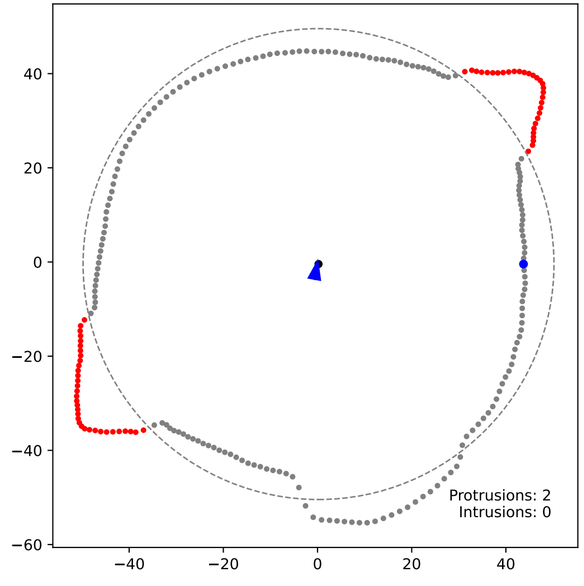

Shape evolution (t = 178.00)
Riemann Velocity: 0.1759
Max curvature: 0.0151
200
180
160
140
120
100
440
460
480
500

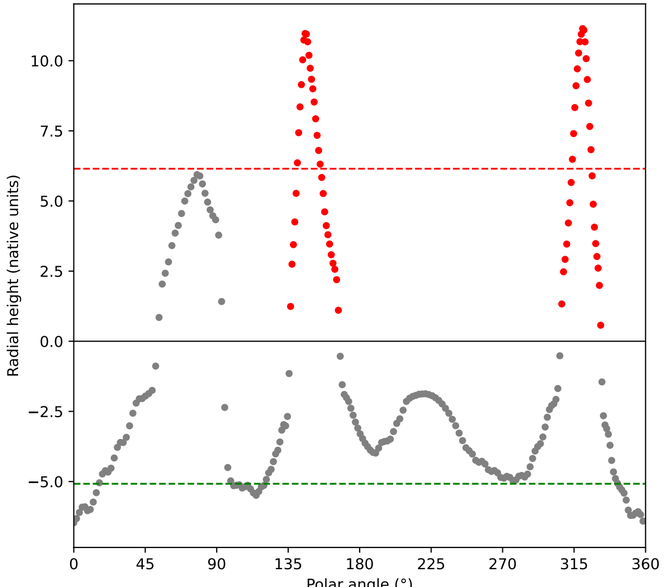

Topographical representation
Protrusions: 2
Intrusions: 0
40
20
0
−20
−40
−60
−40
−20
0
20
40

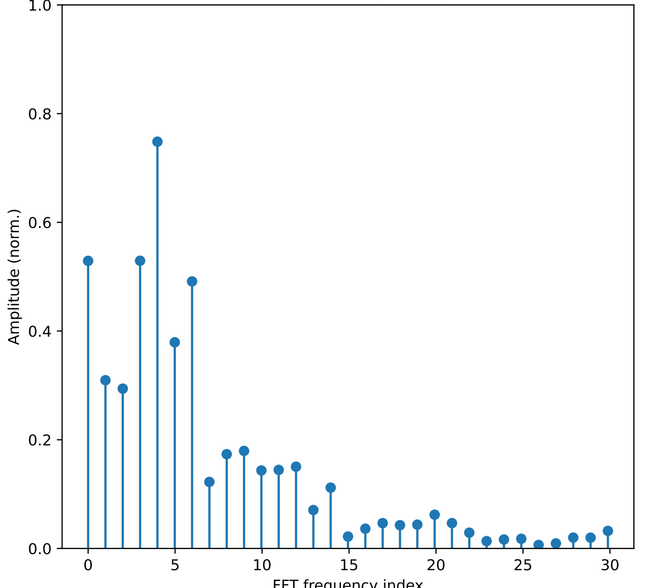

Topographical height
Radial height (native units)
Polar angle (°)
10.0
7.5
5.0
2.5
0.0
−2.5
−5.0
0
45
90
135
180
225
270
315
360

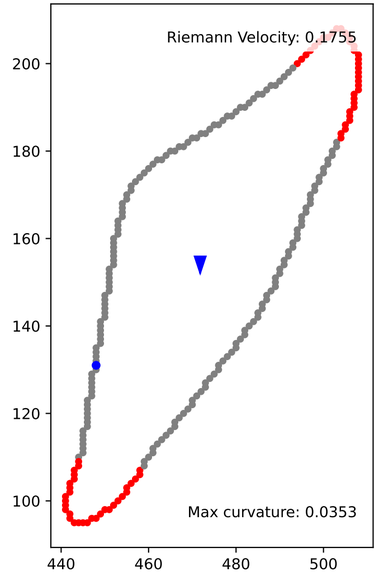

FFT spectrum (scatter)
Amplitude (norm.)
FFT frequency index
1.0
0.8
0.6
0.4
0.2
0.0
0
5
10
15
20
25
30

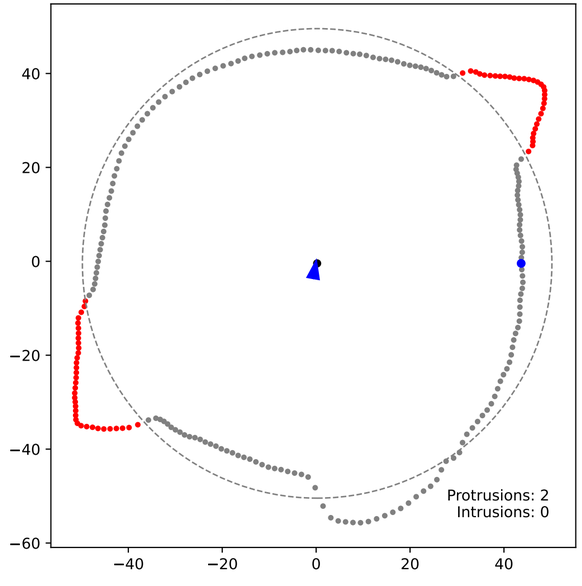

Shape evolution (t = 179.00)
Riemann Velocity: 0.1692
Max curvature: 0.0163
200
180
160
140
120
100
440
460
480
500

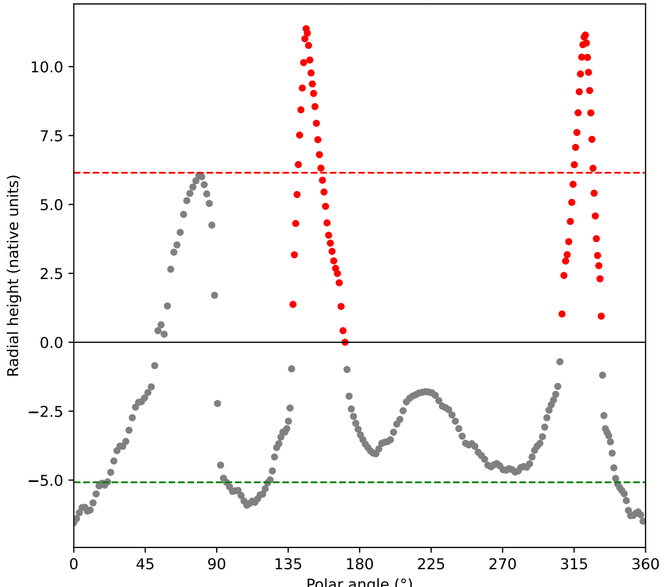

Topographical representation
Protrusions: 2
Intrusions: 0
40
20
0
−20
−40
−60
−40
−20
0
20
40

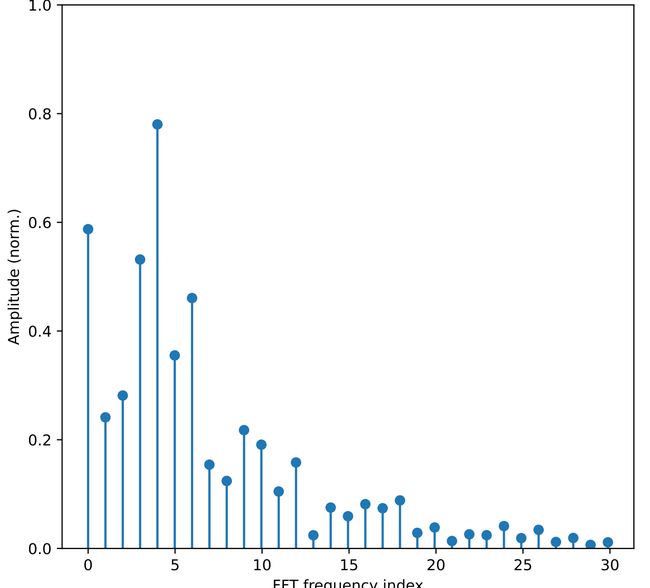

Topographical height
Radial height (native units)
Polar angle (°)
10.0
7.5
5.0
2.5
0.0
−2.5
−5.0
0
45
90
135
180
225
270
315
360

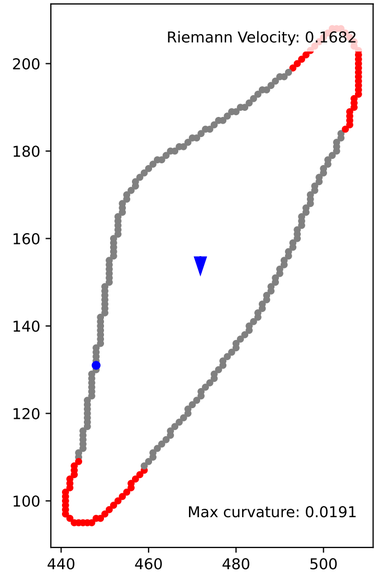

FFT spectrum (scatter)
Amplitude (norm.)
FFT frequency index
1.0
0.8
0.6
0.4
0.2
0.0
0
5
10
15
20
25
30

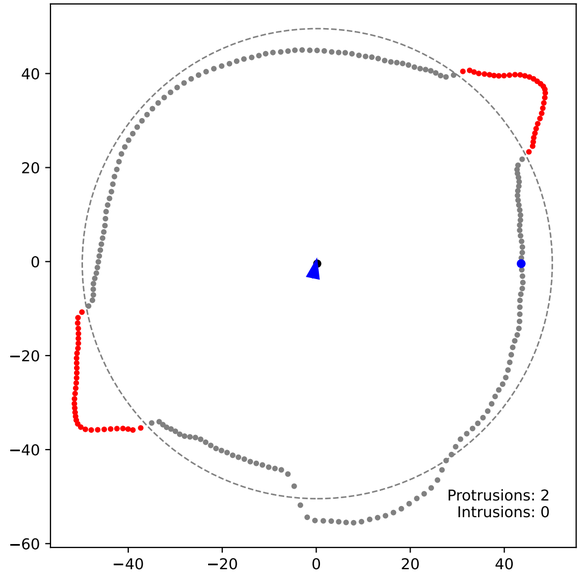

Shape evolution (t = 180.00)
Riemann Velocity: 0.1755
Max curvature: 0.0353
200
180
160
140
120
100
440
460
480
500

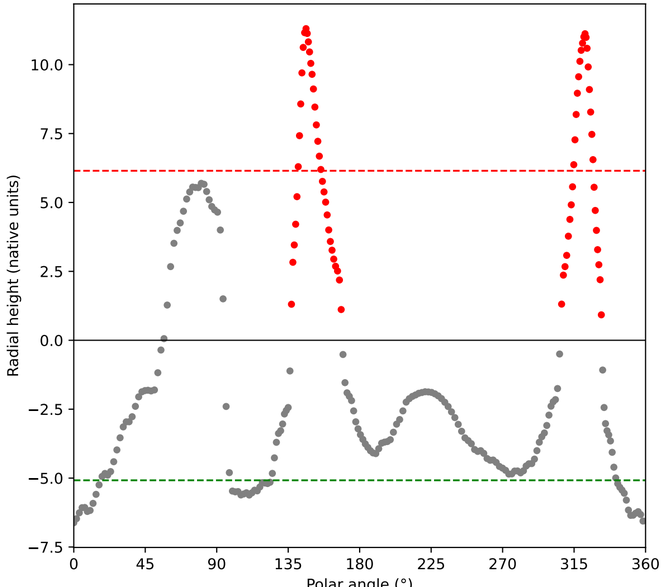

Topographical representation
Protrusions: 2
Intrusions: 0
40
20
0
−20
−40
−60
−40
−20
0
20
40

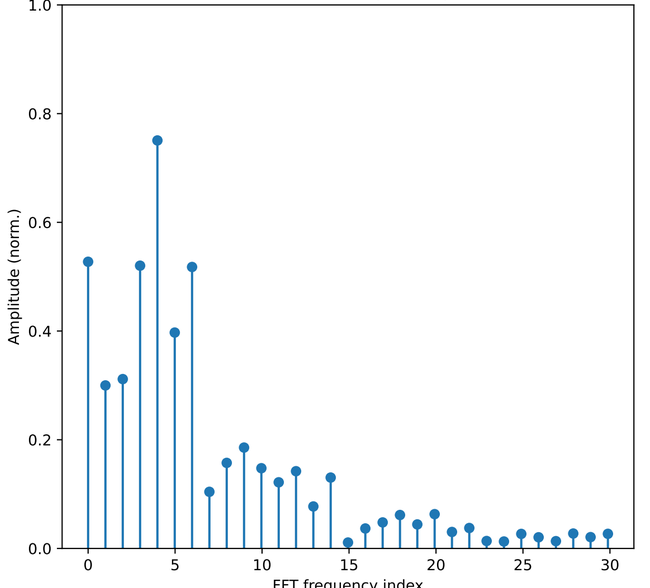

Topographical height
Radial height (native units)
Polar angle (°)
10.0
7.5
5.0
2.5
0.0
−2.5
−5.0
0
45
90
135
180
225
270
315
360

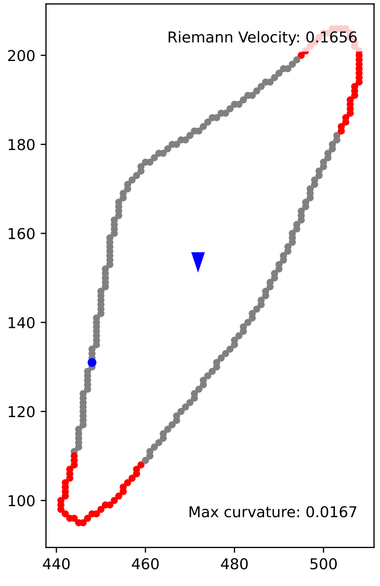

FFT spectrum (scatter)
Amplitude (norm.)
FFT frequency index
1.0
0.8
0.6
0.4
0.2
0.0
0
5
10
15
20
25
30

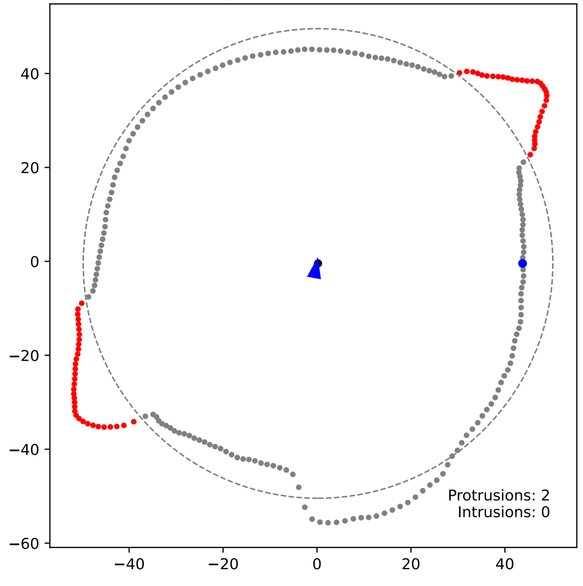

Shape evolution (t = 181.00)
Riemann Velocity: 0.1682
Max curvature: 0.0191
200
180
160
140
120
100
440
460
480
500

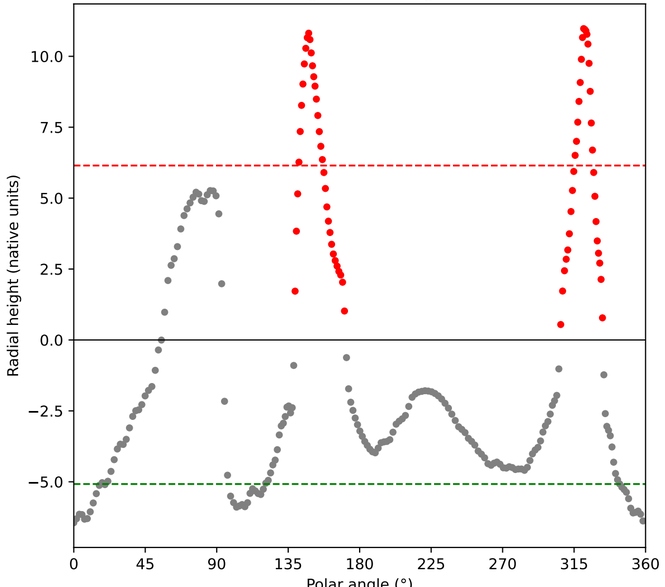

Topographical representation
Protrusions: 2
Intrusions: 0
40
20
0
−20
−40
−60
−40
−20
0
20
40

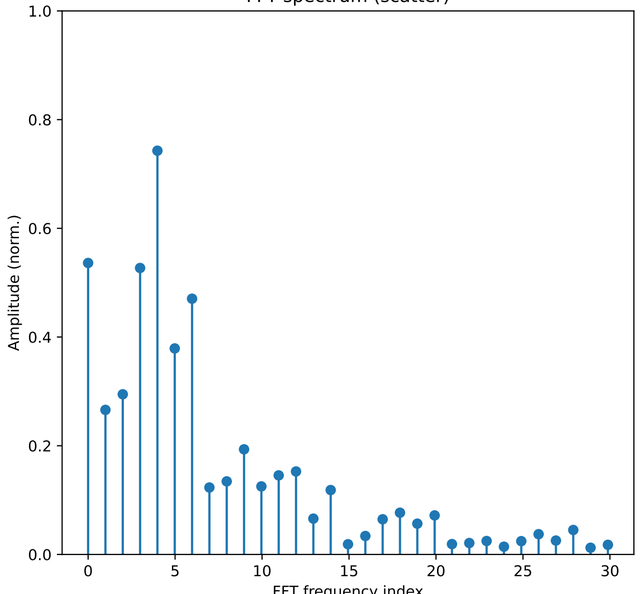

Topographical height
Radial height (native units)
Polar angle (°)
10.0
7.5
5.0
2.5
0.0
−2.5
−5.0
−7.5
0
45
90
135
180
225
270
315
360

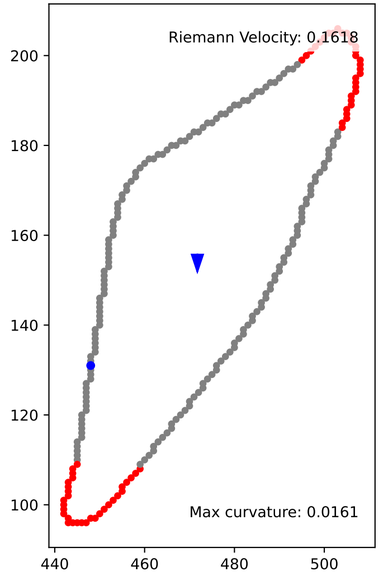

FFT spectrum (scatter)
Amplitude (norm.)
FFT frequency index
1.0
0.8
0.6
0.4
0.2
0.0
0
5
10
15
20
25
30

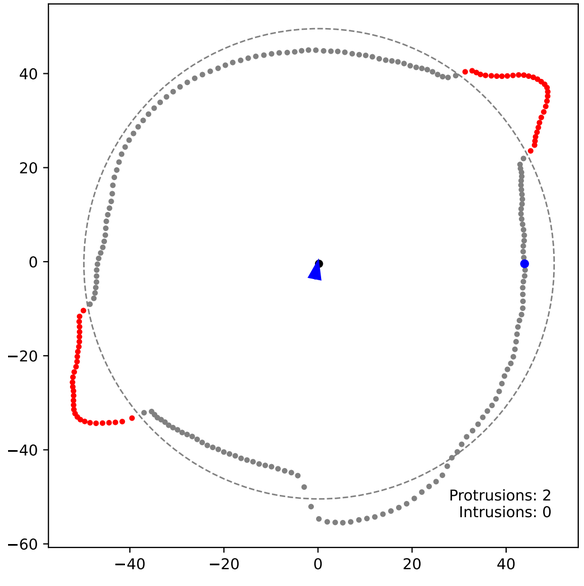

Shape evolution (t = 182.00)
Riemann Velocity: 0.1656
Max curvature: 0.0167
200
180
160
140
120
100
440
460
480
500

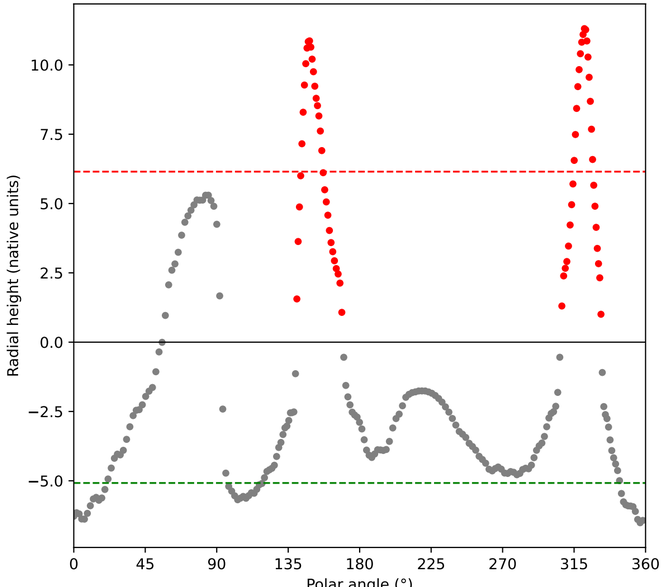

Topographical representation
Protrusions: 2
Intrusions: 0
40
20
0
−20
−40
−60
−40
−20
0
20
40

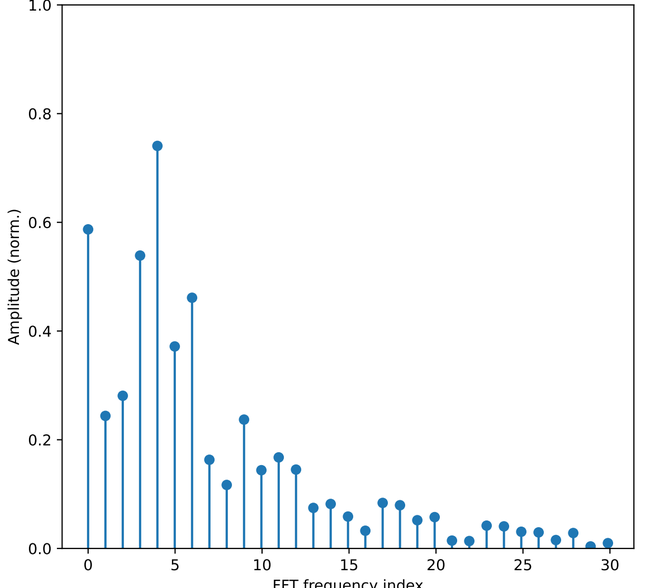

Topographical height
Radial height (native units)
Polar angle (°)
10.0
7.5
5.0
2.5
0.0
−2.5
−5.0
0
45
90
135
180
225
270
315
360

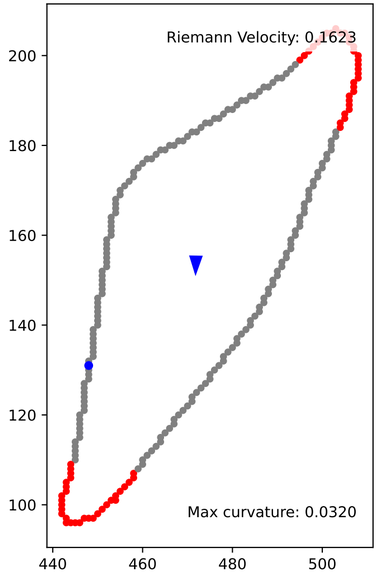

FFT spectrum (scatter)
Amplitude (norm.)
FFT frequency index
1.0
0.8
0.6
0.4
0.2
0.0
0
5
10
15
20
25
30

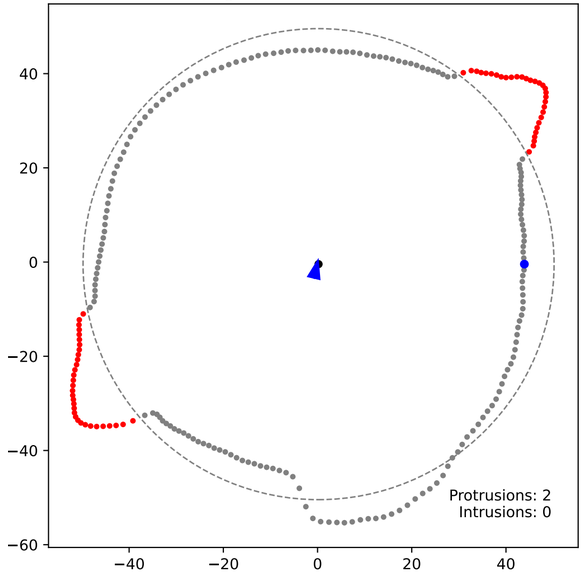

Shape evolution (t = 183.00)
Riemann Velocity: 0.1618
Max curvature: 0.0161
200
180
160
140
120
100
440
460
480
500

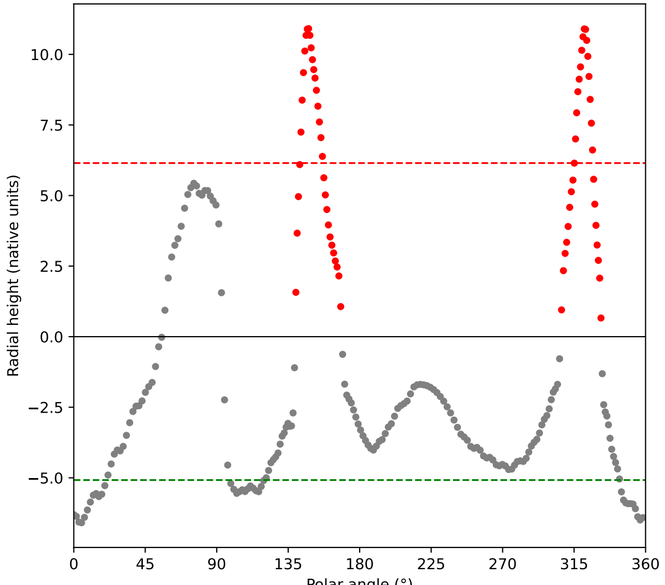

Topographical representation
Protrusions: 2
Intrusions: 0
40
20
0
−20
−40
−60
−40
−20
0
20
40

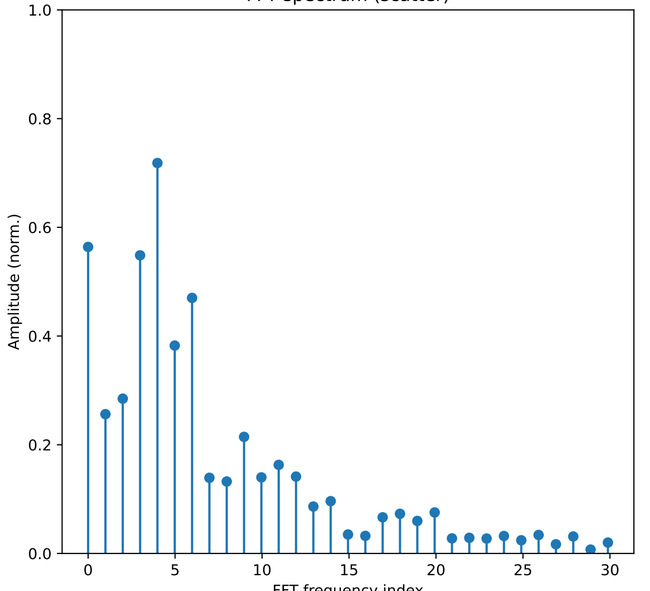

Topographical height
Radial height (native units)
Polar angle (°)
10.0
7.5
5.0
2.5
0.0
−2.5
−5.0
0
45
90
135
180
225
270
315
360

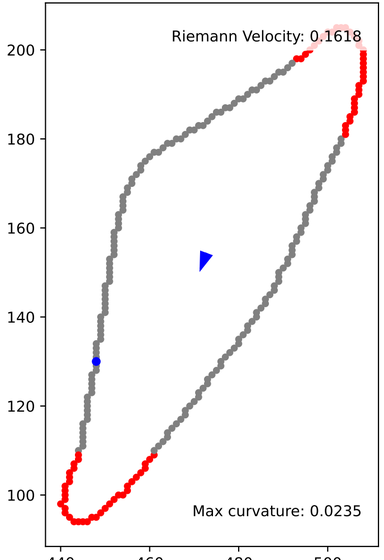

FFT spectrum (scatter)
Amplitude (norm.)
FFT frequency index
1.0
0.8
0.6
0.4
0.2
0.0
0
5
10
15
20
25
30

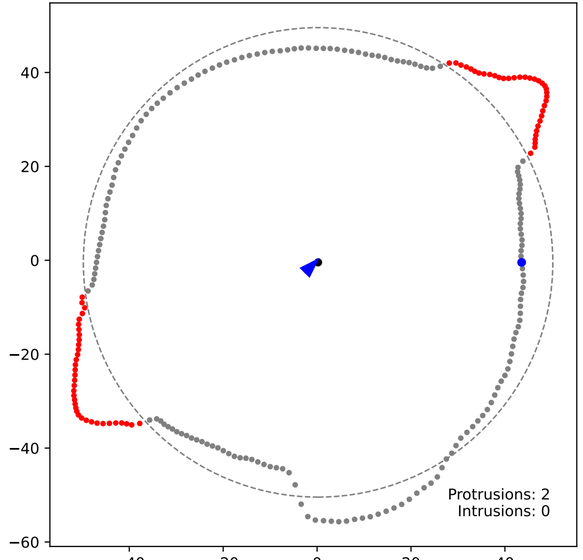

Shape evolution (t = 184.00)
Riemann Velocity: 0.1623
Max curvature: 0.0320
200
180
160
140
120
100
440
460
480
500

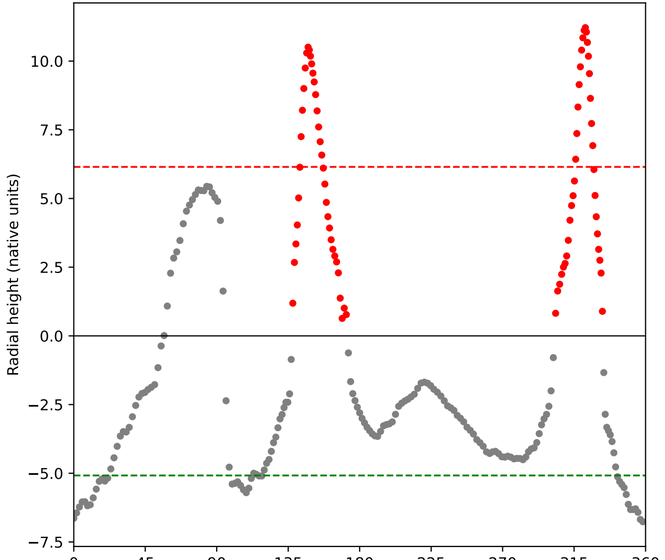

Topographical representation
Protrusions: 2
Intrusions: 0
40
20
0
−20
−40
−60
−40
−20
0
20
40

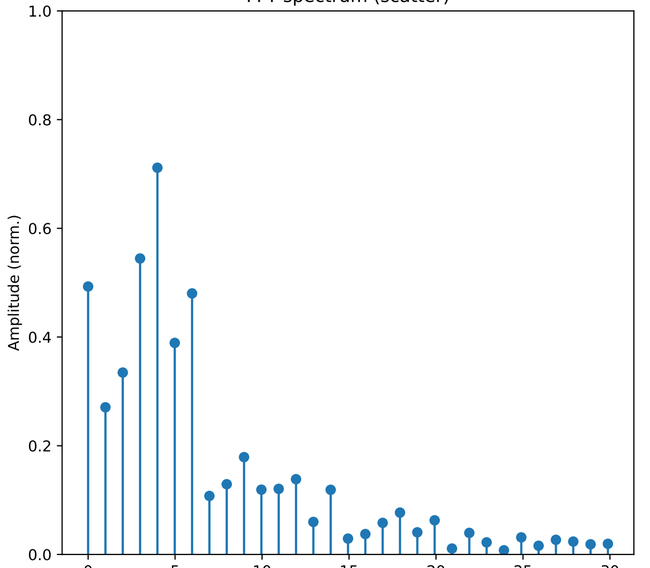

Topographical height
Radial height (native units)
Polar angle (°)
10.0
7.5
5.0
2.5
0.0
−2.5
−5.0
0
45
90
135
180
225
270
315
360

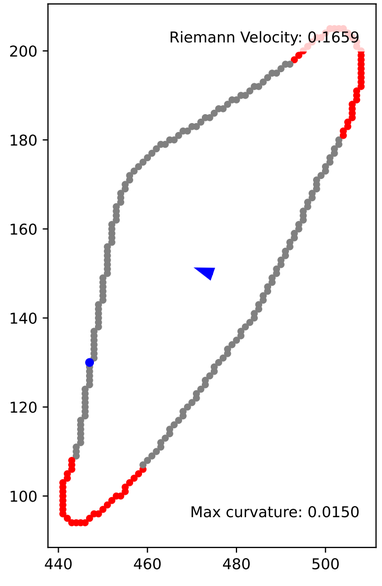

FFT spectrum (scatter)
Amplitude (norm.)
FFT frequency index
1.0
0.8
0.6
0.4
0.2
0.0
0
5
10
15
20
25
30

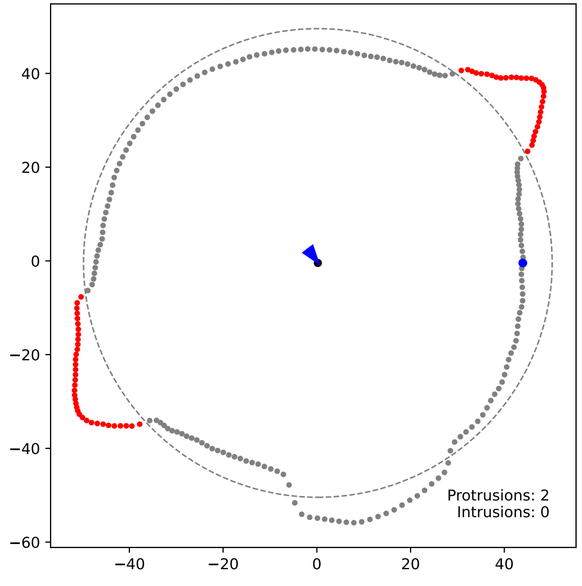

Shape evolution (t = 185.00)
Riemann Velocity: 0.1618
Max curvature: 0.0235
200
180
160
140
120
100
440
460
480
500

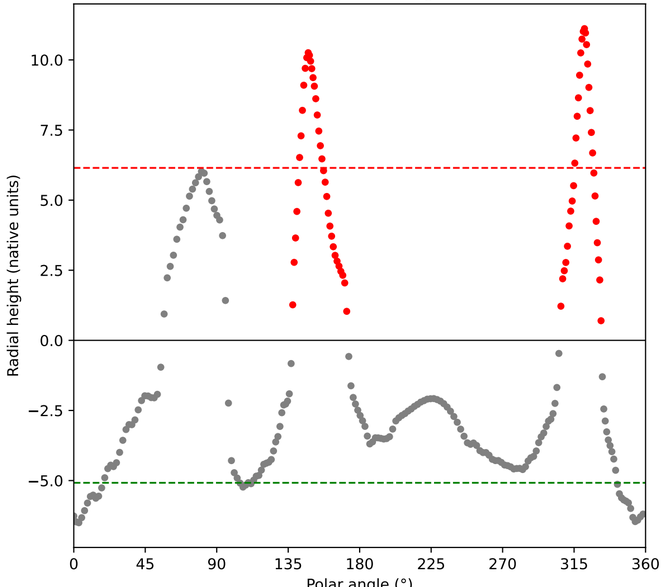

Topographical representation
Protrusions: 2
Intrusions: 0
40
20
0
−20
−40
−60
−40
−20
0
20
40

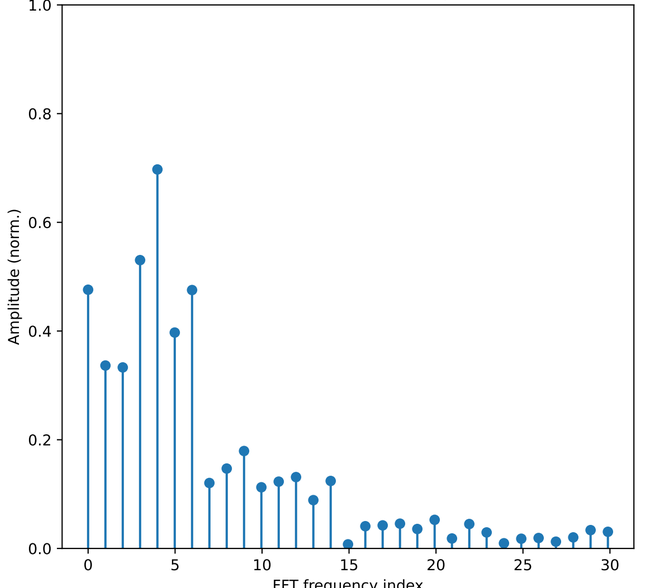

Topographical height
Radial height (native units)
Polar angle (°)
10.0
7.5
5.0
2.5
0.0
−2.5
−5.0
−7.5
0
45
90
135
180
225
270
315
360

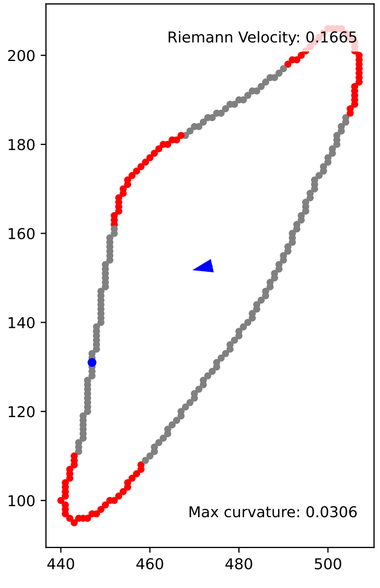

FFT spectrum (scatter)
Amplitude (norm.)
FFT frequency index
1.0
0.8
0.6
0.4
0.2
0.0
0
5
10
15
20
25
30

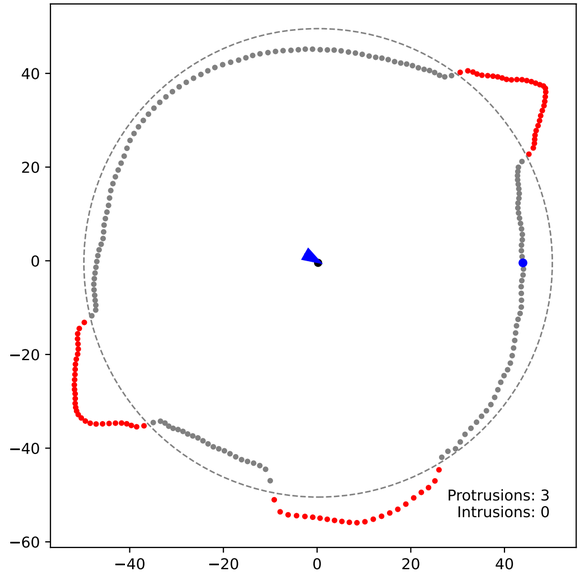

Shape evolution (t = 186.00)
Riemann Velocity: 0.1659
Max curvature: 0.0150
200
180
160
140
120
100
440
460
480
500

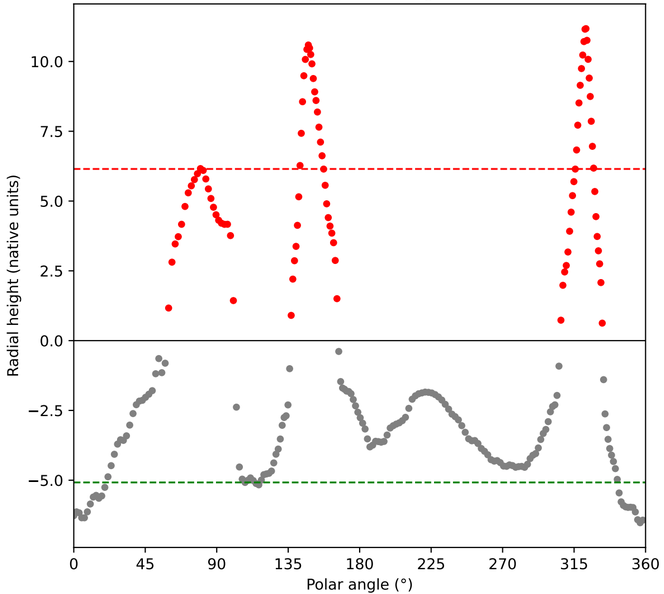

Topographical representation
Protrusions: 2
Intrusions: 0
40
20
0
−20
−40
−60
−40
−20
0
20
40

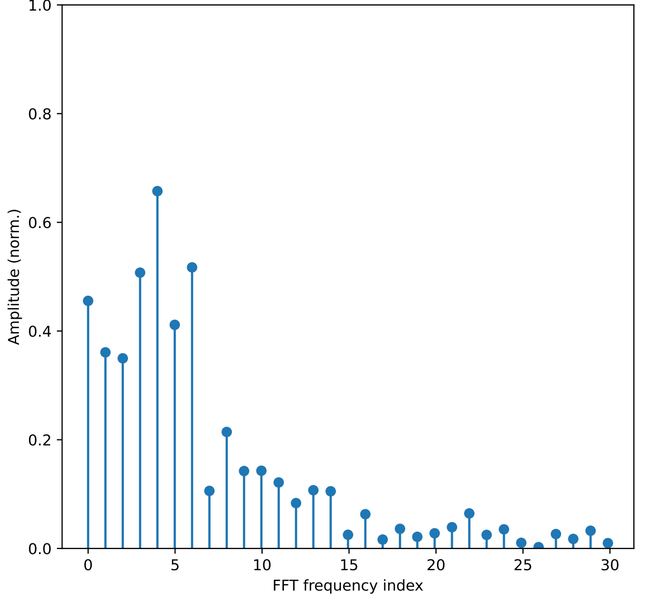

Topographical height
Radial height (native units)
Polar angle (°)
10.0
7.5
5.0
2.5
0.0
−2.5
−5.0
0
45
90
135
180
225
270
315
360

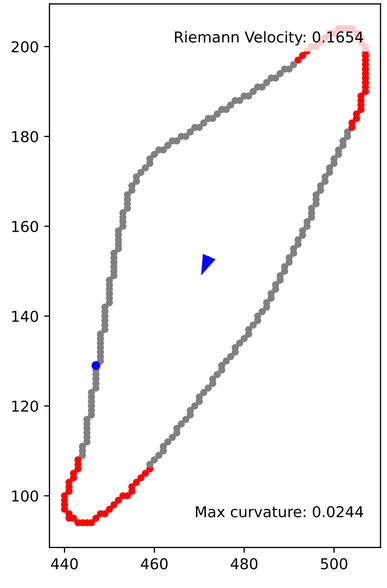

FFT spectrum (scatter)
Amplitude (norm.)
FFT frequency index
1.0
0.8
0.6
0.4
0.2
0.0
0
5
10
15
20
25
30

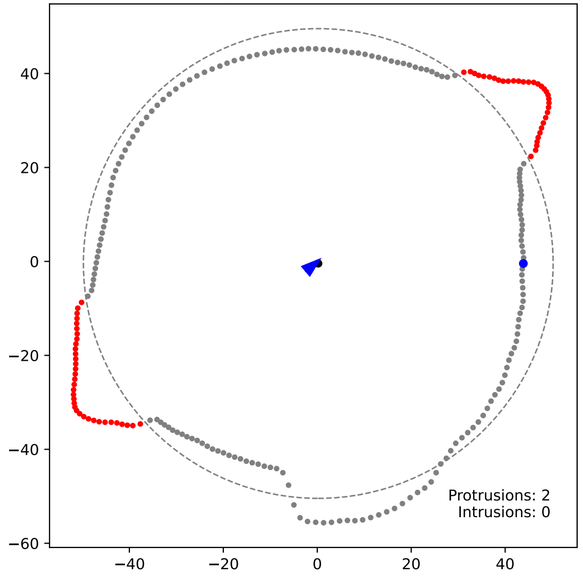

Shape evolution (t = 187.00)
Riemann Velocity: 0.1665
Max curvature: 0.0306
200
180
160
140
120
100
440
460
480
500

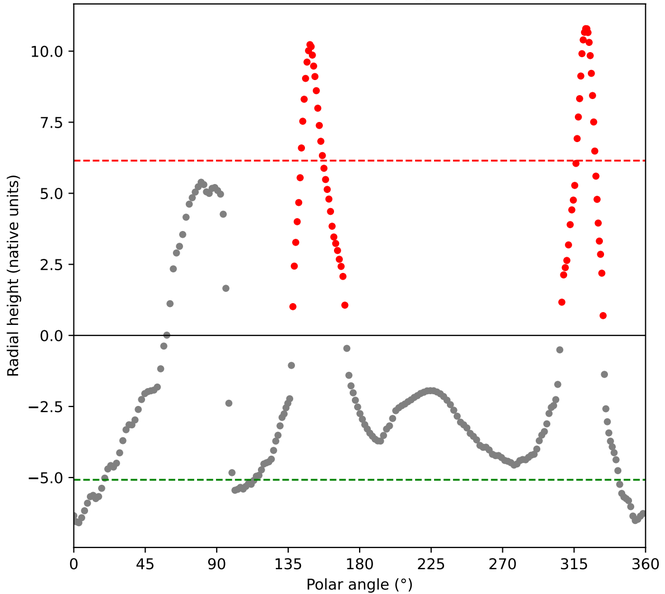

Topographical representation
Protrusions: 3
Intrusions: 0
40
20
0
−20
−40
−60
−40
−20
0
20
40

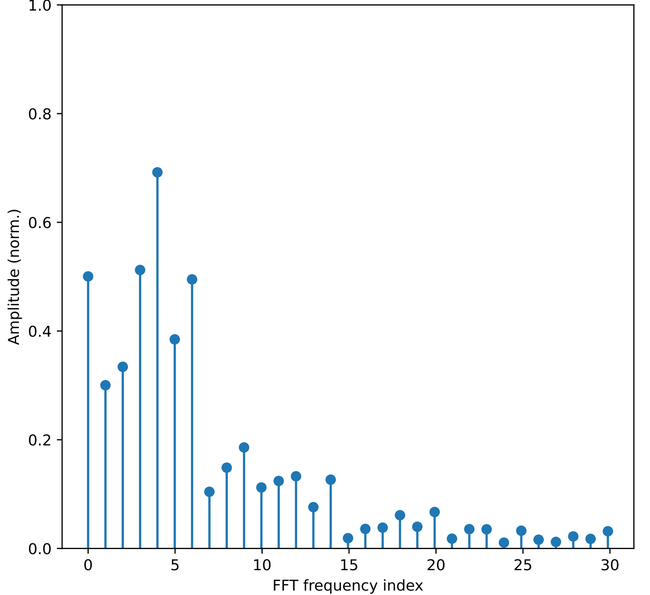

Topographical height
Radial height (native units)
Polar angle (°)
10.0
7.5
5.0
2.5
0.0
−2.5
−5.0
0
45
90
135
180
225
270
315
360

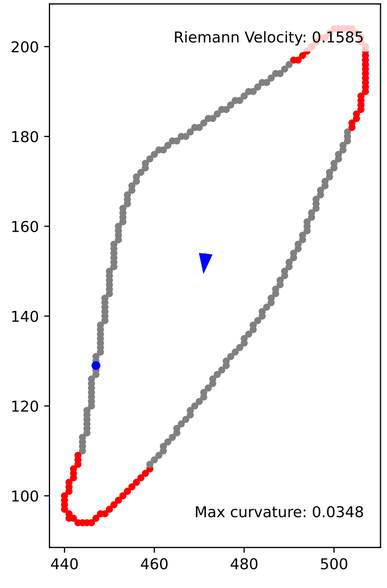

FFT spectrum (scatter)
Amplitude (norm.)
FFT frequency index
1.0
0.8
0.6
0.4
0.2
0.0
0
5
10
15
20
25
30

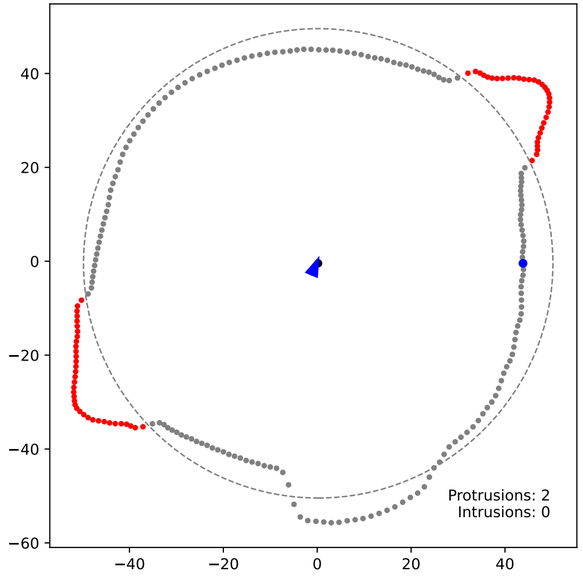

Shape evolution (t = 188.00)
Riemann Velocity: 0.1654
Max curvature: 0.0244
200
180
160
140
120
100
440
460
480
500

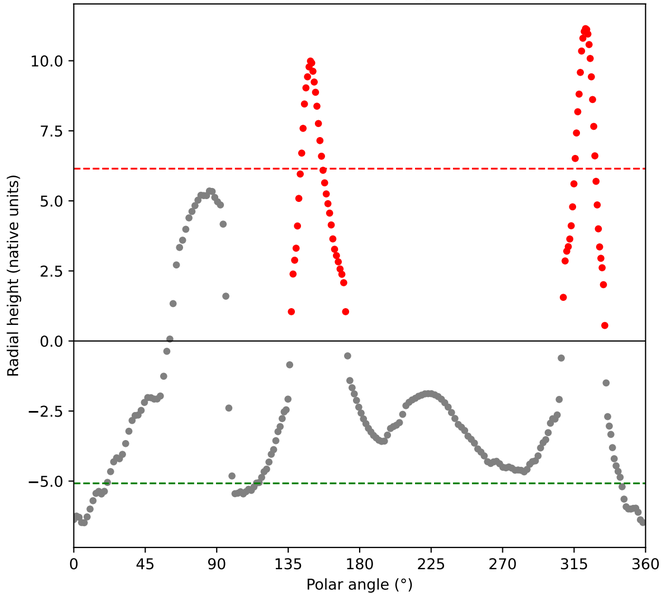

Topographical representation
Protrusions: 2
Intrusions: 0
40
20
0
−20
−40
−60
−40
−20
0
20
40

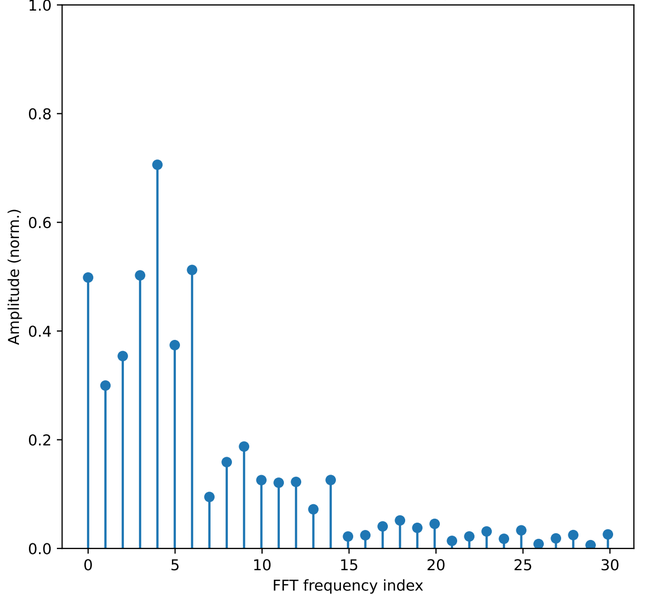

Topographical height
Radial height (native units)
Polar angle (°)
10.0
7.5
5.0
2.5
0.0
−2.5
−5.0
0
45
90
135
180
225
270
315
360

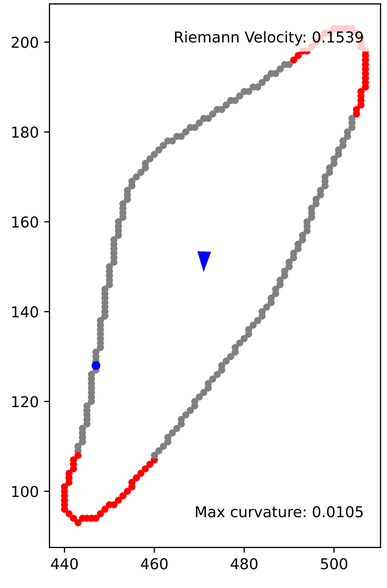

FFT spectrum (scatter)
Amplitude (norm.)
FFT frequency index
1.0
0.8
0.6
0.4
0.2
0.0
0
5
10
15
20
25
30

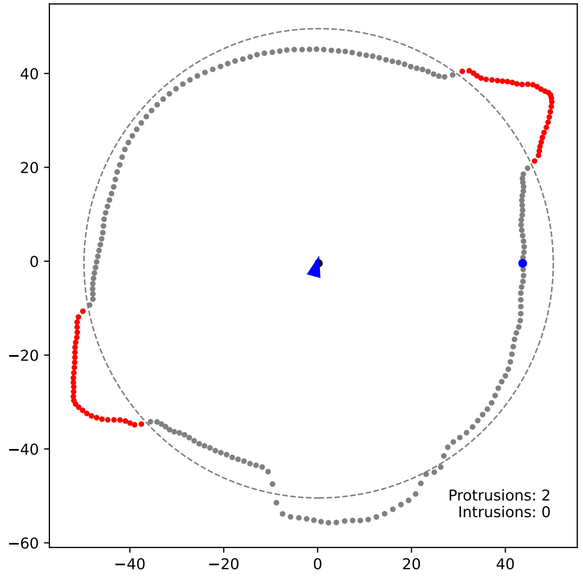

Shape evolution (t = 189.00)
Riemann Velocity: 0.1585
Max curvature: 0.0348
200
180
160
140
120
100
440
460
480
500

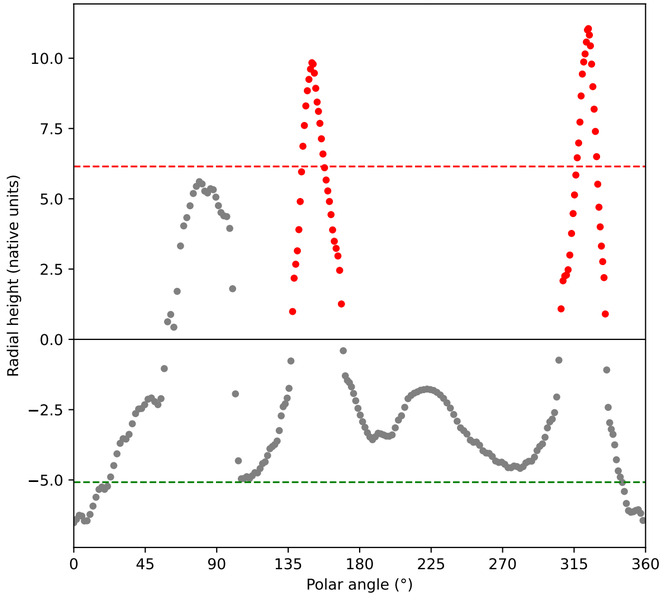

Topographical representation
Protrusions: 2
Intrusions: 0
40
20
0
−20
−40
−60
−40
−20
0
20
40

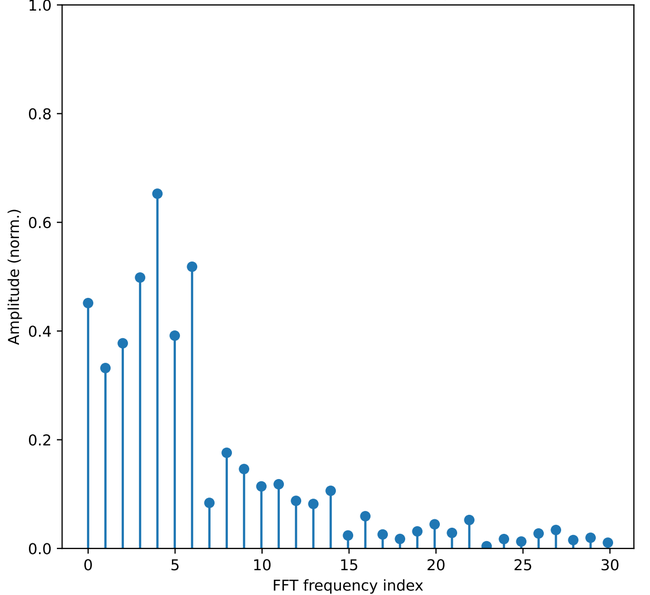

Topographical height
Radial height (native units)
Polar angle (°)
10.0
7.5
5.0
2.5
0.0
−2.5
−5.0
0
45
90
135
180
225
270
315
360

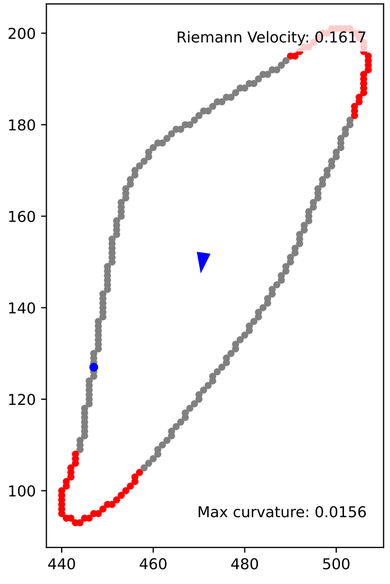

FFT spectrum (scatter)
Amplitude (norm.)
FFT frequency index
1.0
0.8
0.6
0.4
0.2
0.0
0
5
10
15
20
25
30

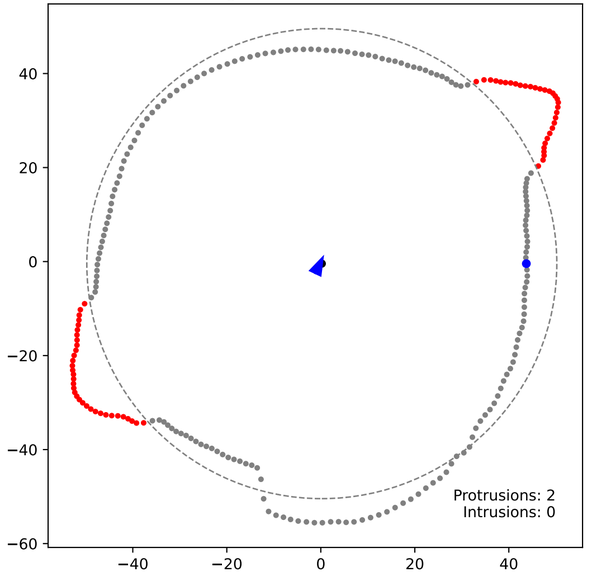

Shape evolution (t = 190.00)
Riemann Velocity: 0.1539
Max curvature: 0.0105
200
180
160
140
120
100
440
460
480
500

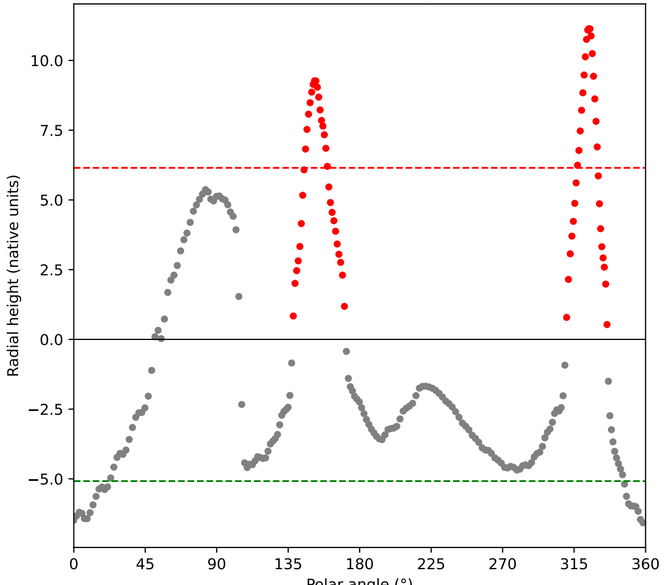

Topographical representation
Protrusions: 2
Intrusions: 0
40
20
0
−20
−40
−60
−40
−20
0
20
40

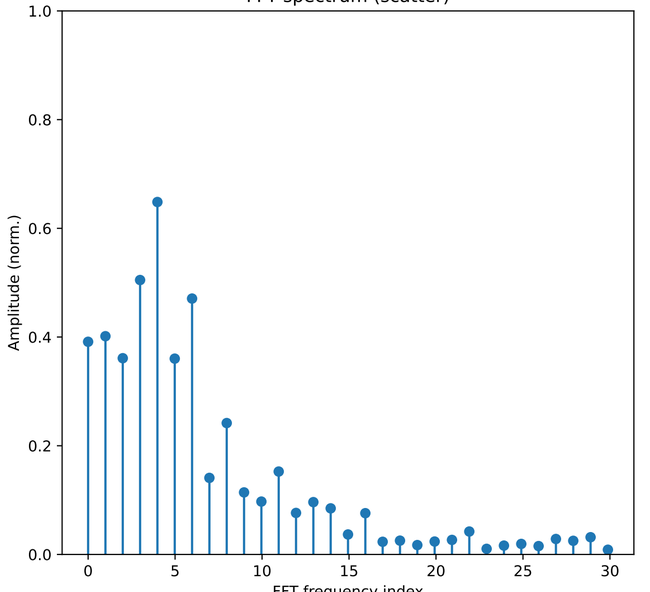

Topographical height
Radial height (native units)
Polar angle (°)
10.0
7.5
5.0
2.5
0.0
−2.5
−5.0
0
45
90
135
180
225
270
315
360

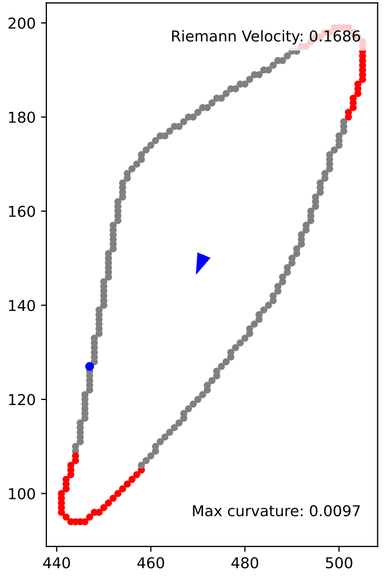

FFT spectrum (scatter)
Amplitude (norm.)
FFT frequency index
1.0
0.8
0.6
0.4
0.2
0.0
0
5
10
15
20
25
30

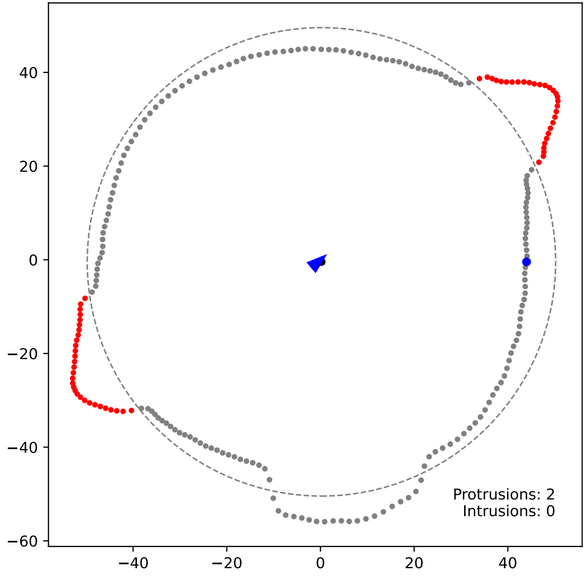

Shape evolution (t = 191.00)
Riemann Velocity: 0.1617
Max curvature: 0.0156
200
180
160
140
120
100
440
460
480
500

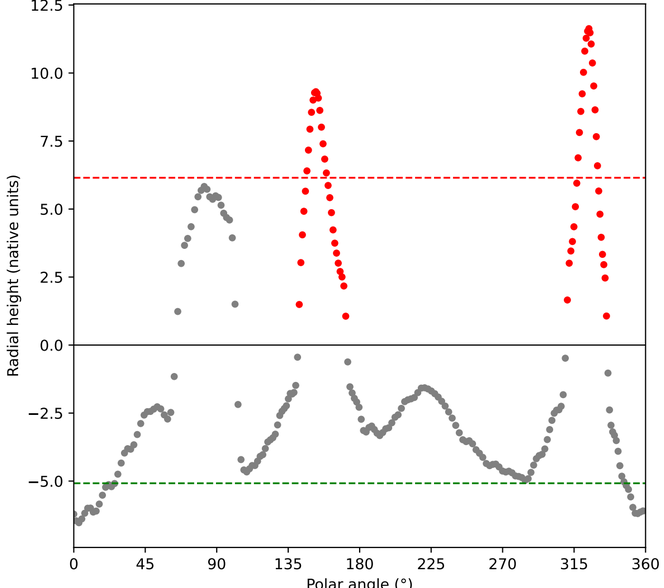

Topographical representation
Protrusions: 2
Intrusions: 0
40
20
0
−20
−40
−60
−40
−20
0
20
40

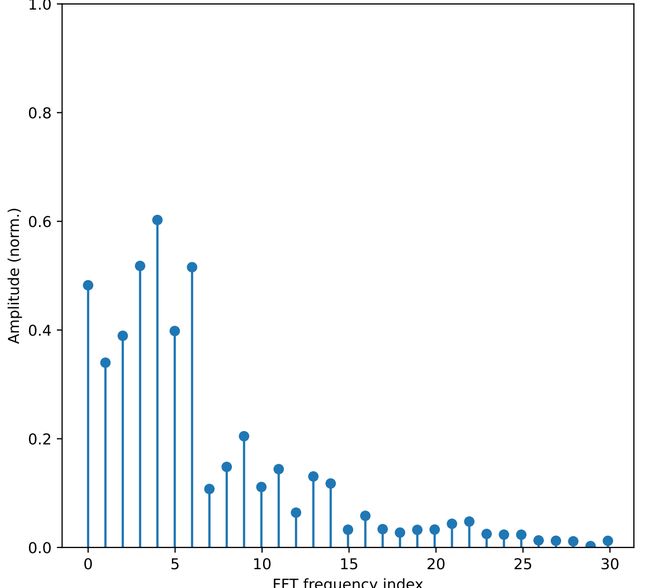

Topographical height
Radial height (native units)
Polar angle (°)
10.0
7.5
5.0
2.5
0.0
−2.5
−5.0
0
45
90
135
180
225
270
315
360

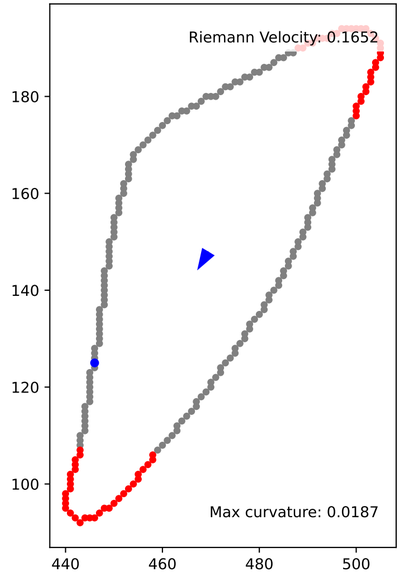

FFT spectrum (scatter)
Amplitude (norm.)
FFT frequency index
1.0
0.8
0.6
0.4
0.2
0.0
0
5
10
15
20
25
30

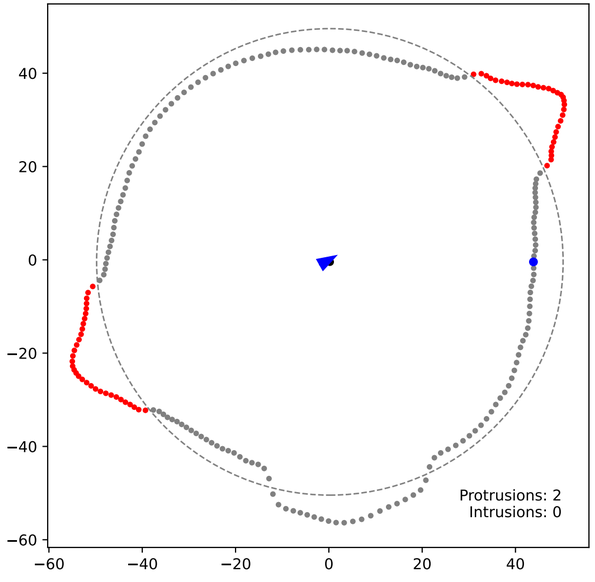

Shape evolution (t = 192.00)
Riemann Velocity: 0.1686
Max curvature: 0.0097
200
180
160
140
120
100
440
460
480
500

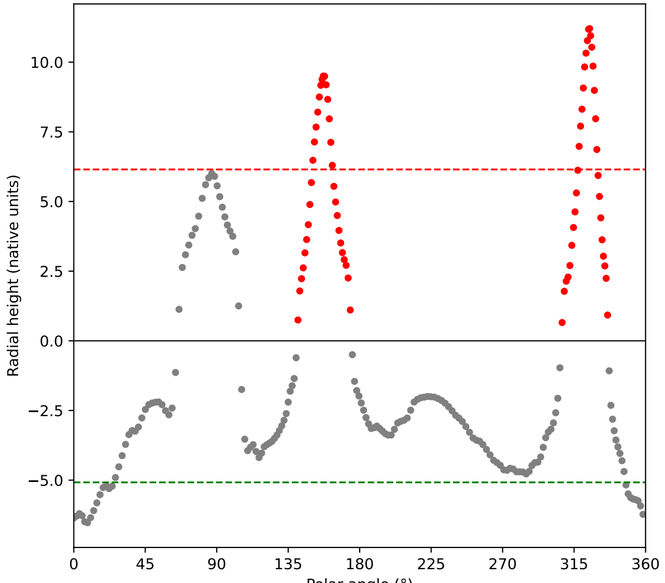

Topographical representation
Protrusions: 2
Intrusions: 0
40
20
0
−20
−40
−60
−40
−20
0
20
40

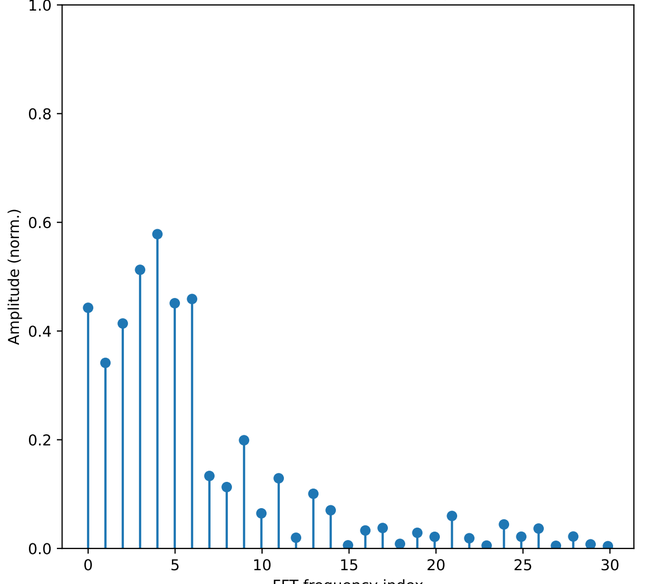

Topographical height
Radial height (native units)
Polar angle (°)
12.5
10.0
7.5
5.0
2.5
0.0
−2.5
−5.0
0
45
90
135
180
225
270
315
360

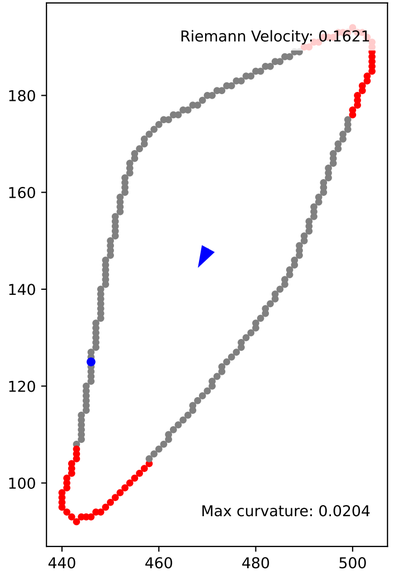

FFT spectrum (scatter)
Amplitude (norm.)
FFT frequency index
1.0
0.8
0.6
0.4
0.2
0.0
0
5
10
15
20
25
30

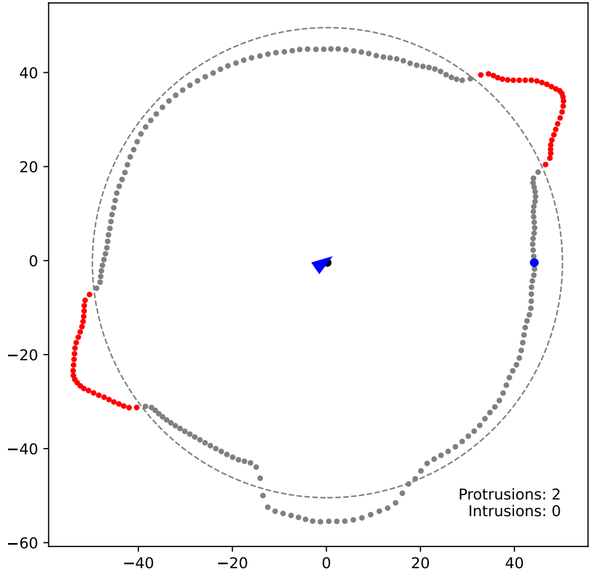

Shape evolution (t = 193.00)
Riemann Velocity: 0.1652
Max curvature: 0.0187
180
160
140
120
100
440
460
480
500

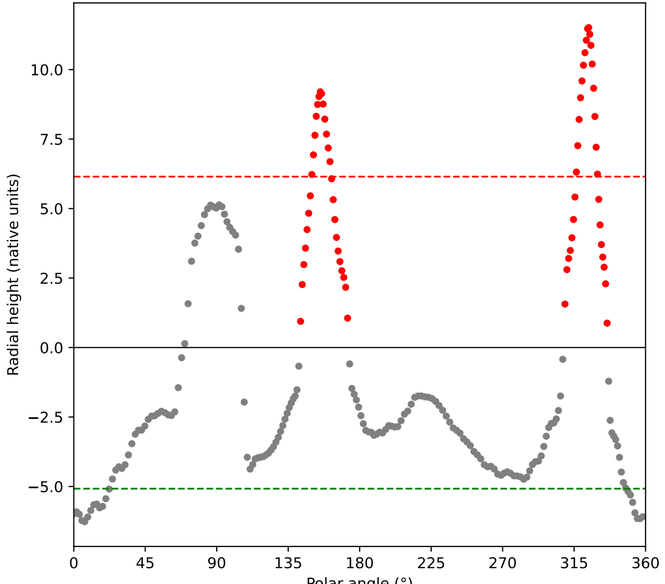

Topographical representation
Protrusions: 2
Intrusions: 0
40
20
0
−20
−40
−60
−60
−40
−20
0
20
40

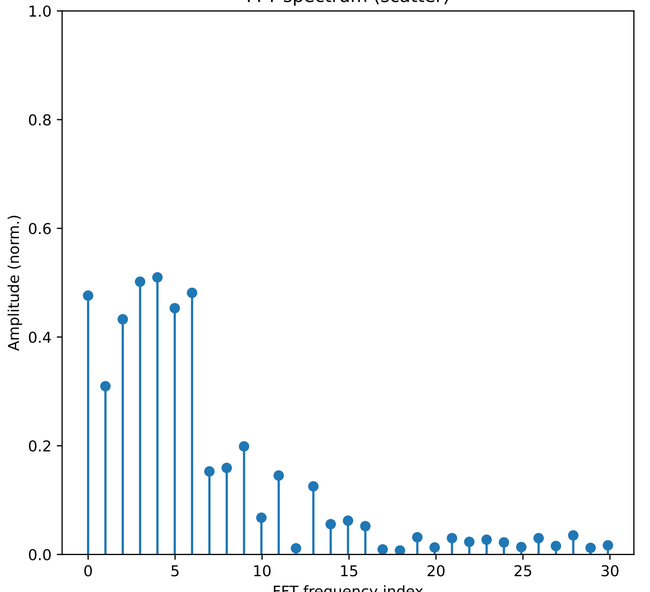

Topographical height
Radial height (native units)
Polar angle (°)
10.0
7.5
5.0
2.5
0.0
−2.5
−5.0
0
45
90
135
180
225
270
315
360

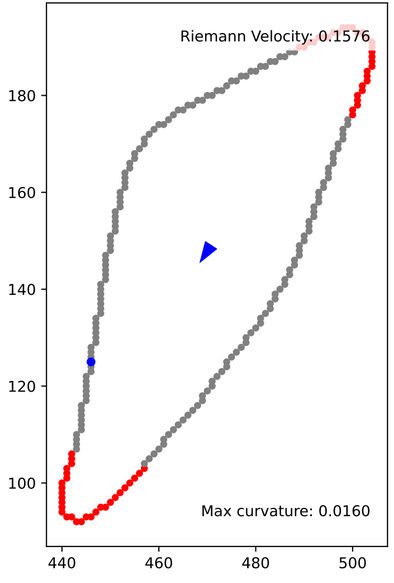

FFT spectrum (scatter)
Amplitude (norm.)
FFT frequency index
1.0
0.8
0.6
0.4
0.2
0.0
0
5
10
15
20
25
30

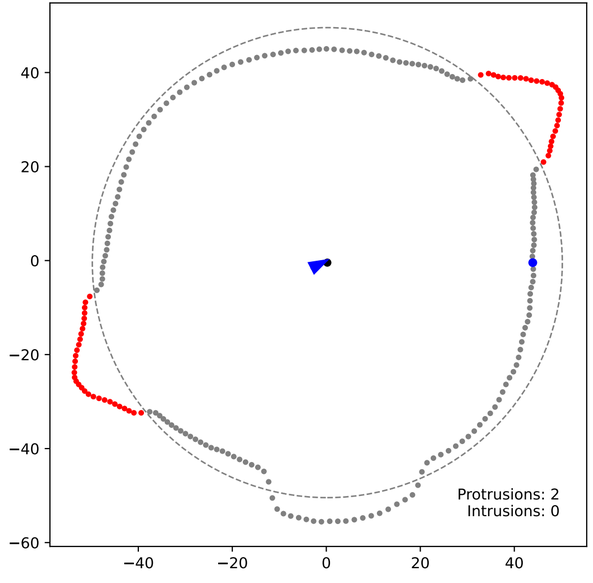

Shape evolution (t = 194.00)
Riemann Velocity: 0.1621
Max curvature: 0.0204
180
160
140
120
100
440
460
480
500

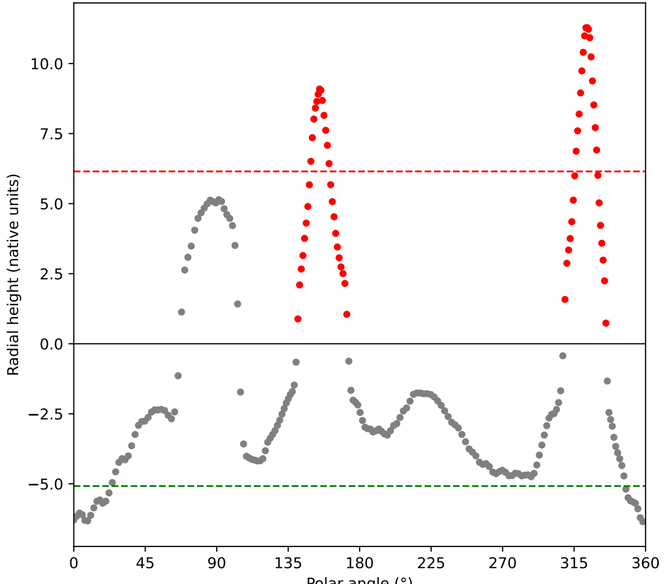

Topographical representation
Protrusions: 2
Intrusions: 0
40
20
0
−20
−40
−60
−40
−20
0
20
40

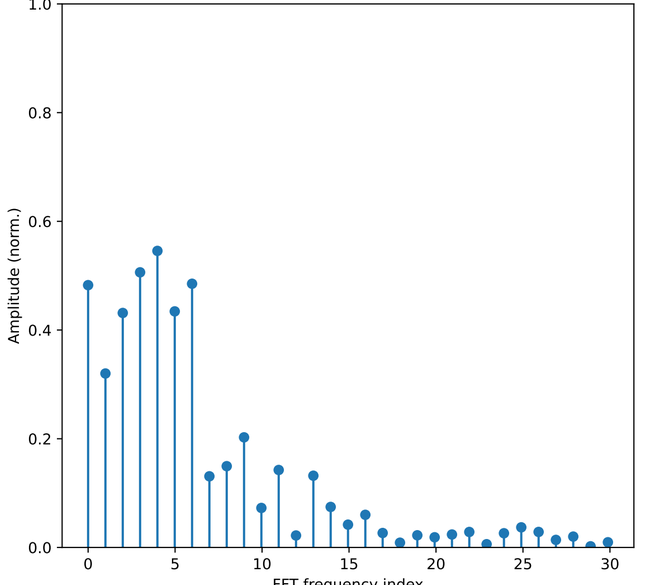

Topographical height
Radial height (native units)
Polar angle (°)
10.0
7.5
5.0
2.5
0.0
−2.5
−5.0
0
45
90
135
180
225
270
315
360

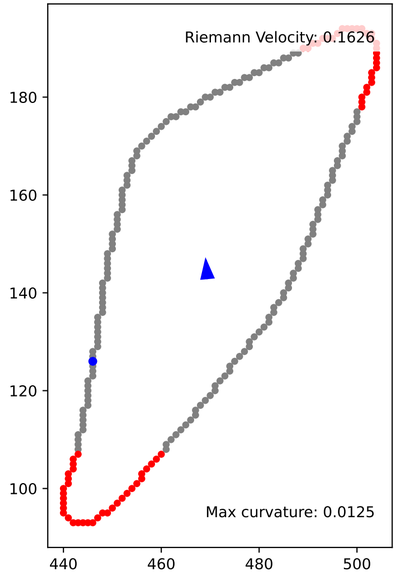

FFT spectrum (scatter)
Amplitude (norm.)
FFT frequency index
1.0
0.8
0.6
0.4
0.2
0.0
0
5
10
15
20
25
30

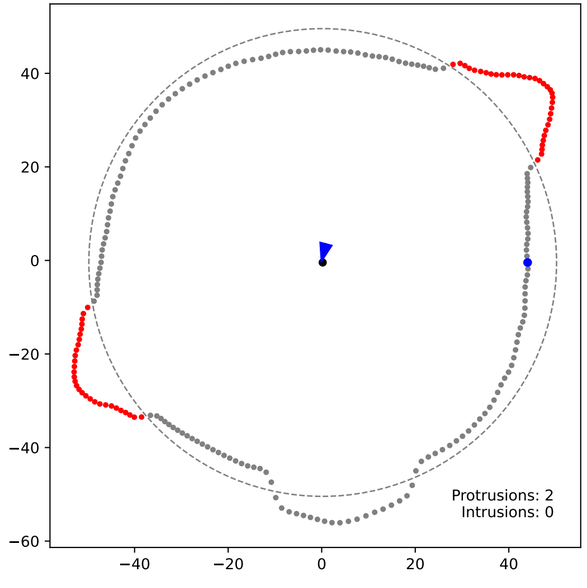

Shape evolution (t = 195.00)
Riemann Velocity: 0.1576
Max curvature: 0.0160
180
160
140
120
100
440
460
480
500

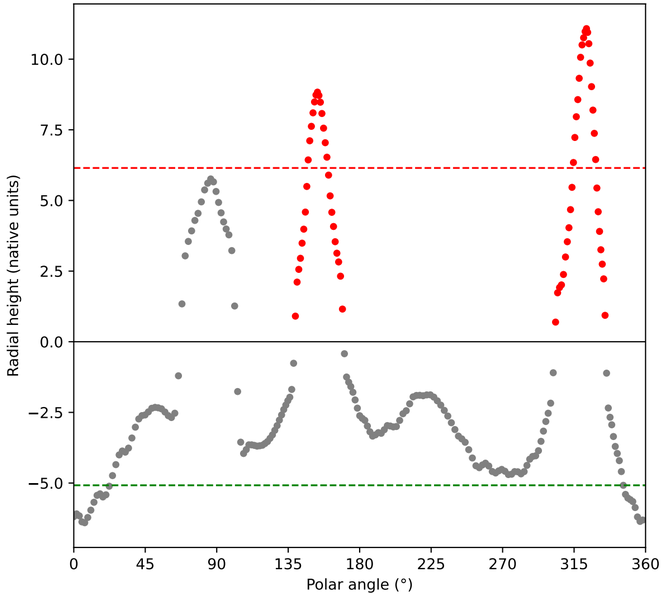

Topographical representation
Protrusions: 2
Intrusions: 0
40
20
0
−20
−40
−60
−40
−20
0
20
40

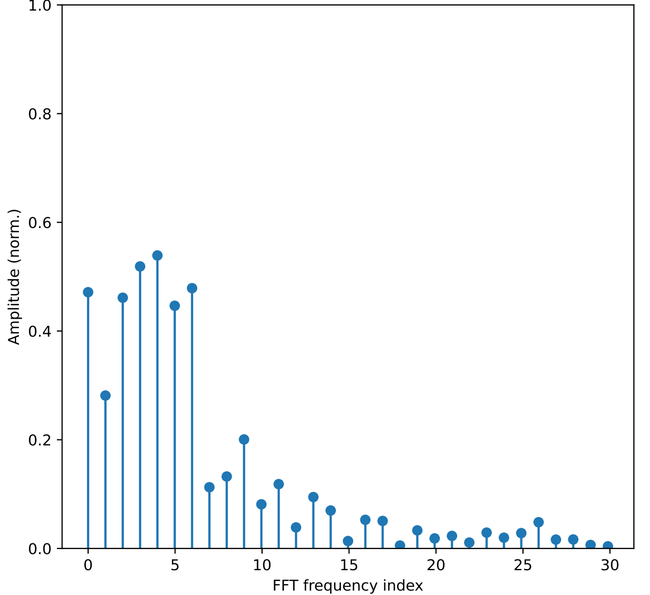

Topographical height
Radial height (native units)
Polar angle (°)
10.0
7.5
5.0
2.5
0.0
−2.5
−5.0
0
45
90
135
180
225
270
315
360

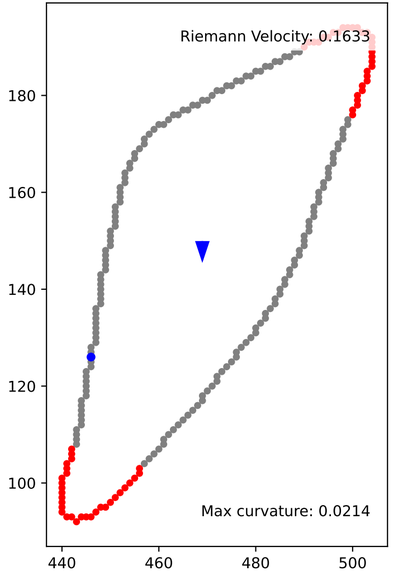

FFT spectrum (scatter)
Amplitude (norm.)
FFT frequency index
1.0
0.8
0.6
0.4
0.2
0.0
0
5
10
15
20
25
30

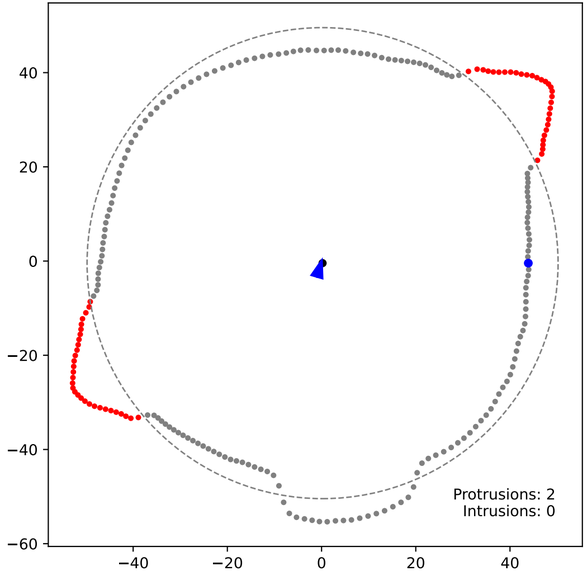

Shape evolution (t = 196.00)
Riemann Velocity: 0.1626
Max curvature: 0.0125
180
160
140
120
100
440
460
480
500

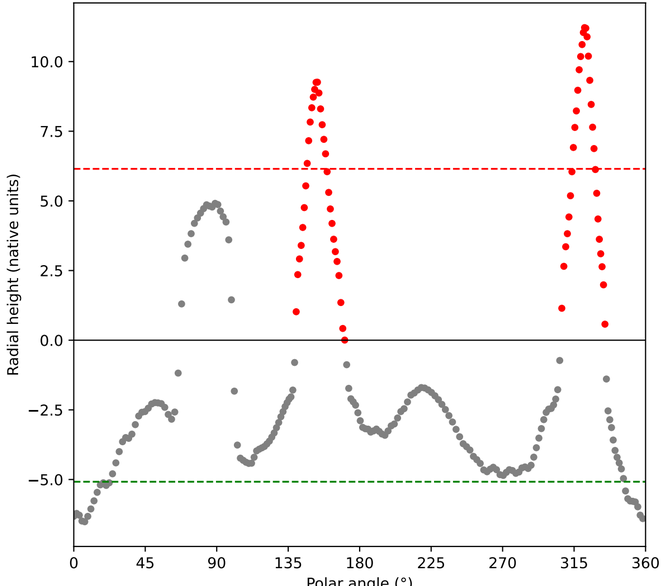

Topographical representation
Protrusions: 2
Intrusions: 0
40
20
0
−20
−40
−60
−40
−20
0
20
40

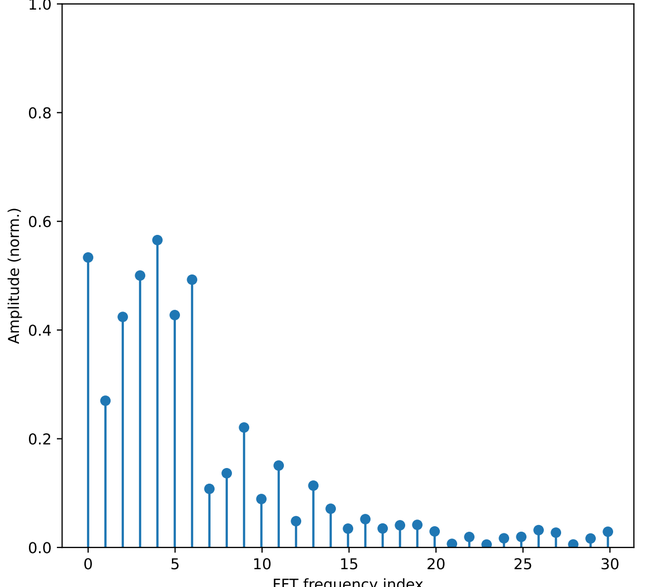

Topographical height
Radial height (native units)
Polar angle (°)
10.0
7.5
5.0
2.5
0.0
−2.5
−5.0
0
45
90
135
180
225
270
315
360

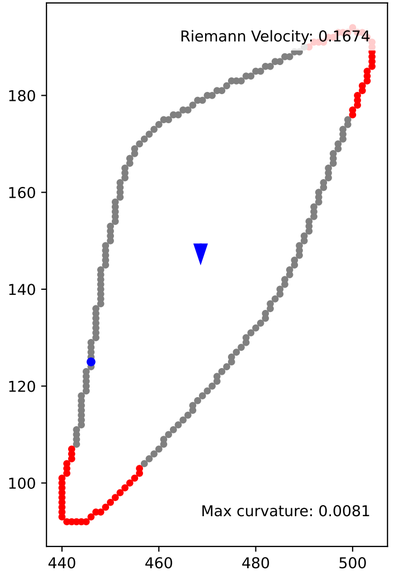

FFT spectrum (scatter)
Amplitude (norm.)
FFT frequency index
1.0
0.8
0.6
0.4
0.2
0.0
0
5
10
15
20
25
30


Shape evolution (t = 197.00)
Riemann Velocity: 0.1633
Max curvature: 0.0214
180
160
140
120
100
440
460
480
500


Topographical representation
Protrusions: 2
Intrusions: 0
40
20
0
−20
−40
−60
−40
−20
0
20
40


Topographical height
Radial height (native units)
Polar angle (°)
10.0
7.5
5.0
2.5
0.0
−2.5
−5.0
0
45
90
135
180
225
270
315
360


FFT spectrum (scatter)
Amplitude (norm.)
FFT frequency index
1.0
0.8
0.6
0.4
0.2
0.0
0
5
10
15
20
25
30


Shape evolution (t = 198.00)
Riemann Velocity: 0.1674
Max curvature: 0.0081
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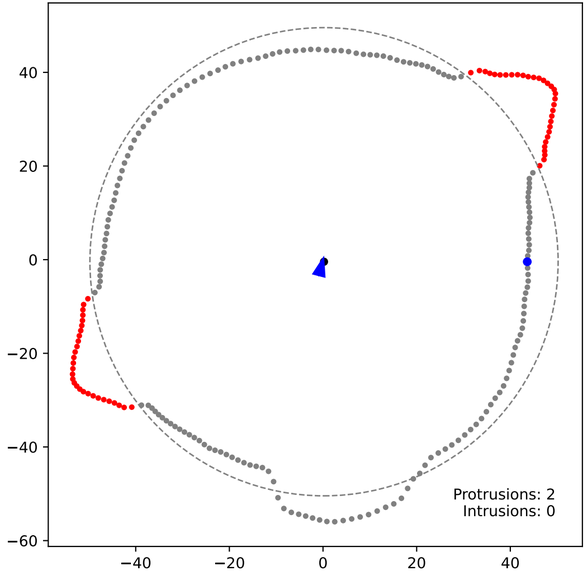
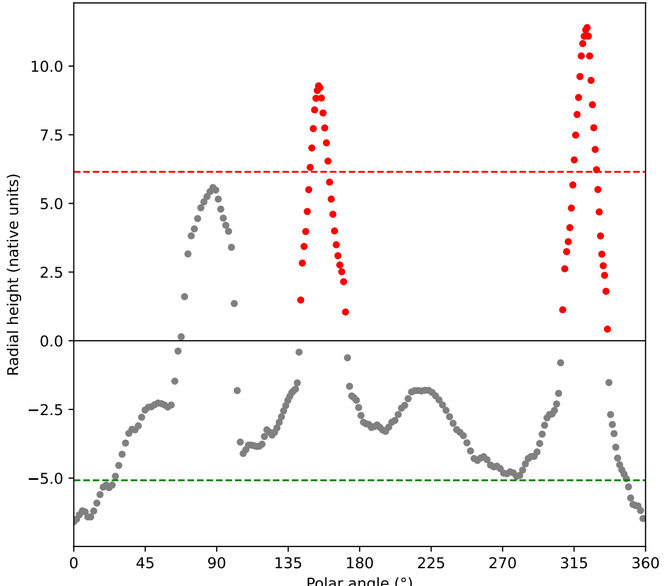
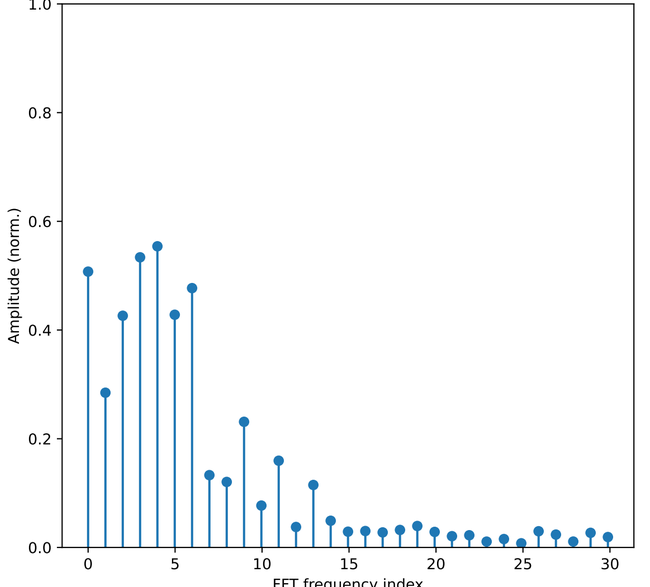
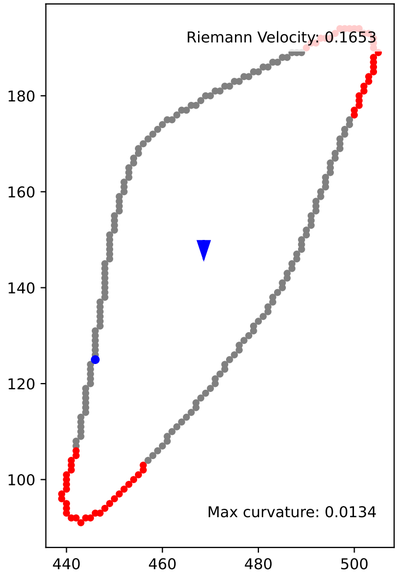
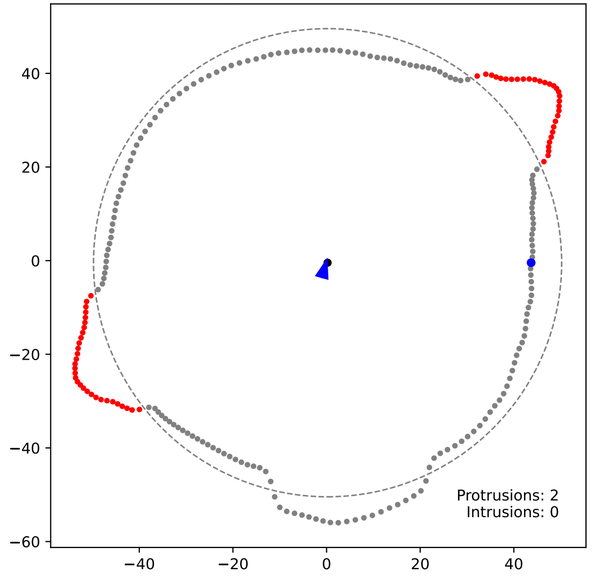
160
140
120
100
440
460
480
500

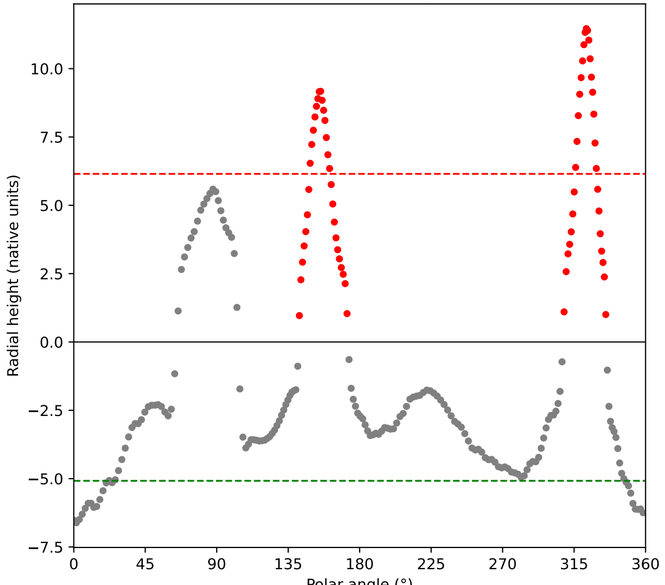

Topographical representation
Protrusions: 2
Intrusions: 0
40
20
0
−20
−40
−60
−40
−20
0
20
40

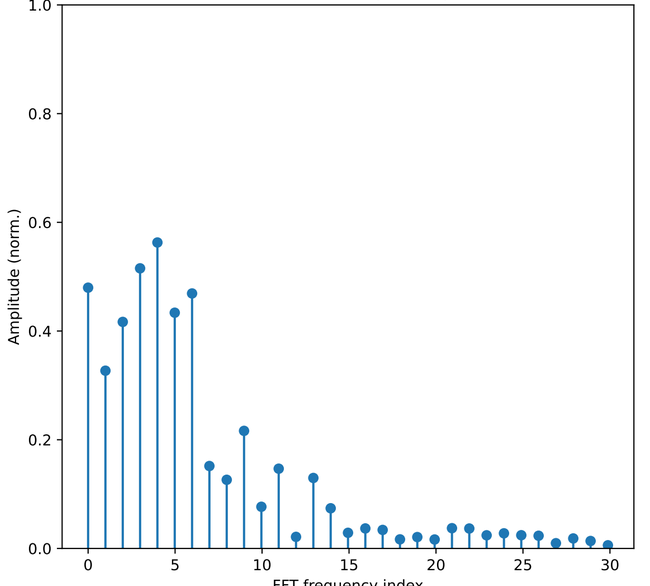

Topographical height
Radial height (native units)
Polar angle (°)
10.0
7.5
5.0
2.5
0.0
−2.5
−5.0
0
45
90
135
180
225
270
315
360

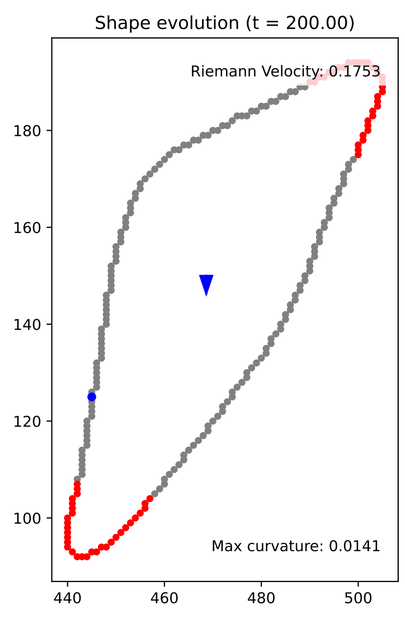

FFT spectrum (scatter)
Amplitude (norm.)
FFT frequency index
1.0
0.8
0.6
0.4
0.2
0.0
0
5
10
15
20
25
30

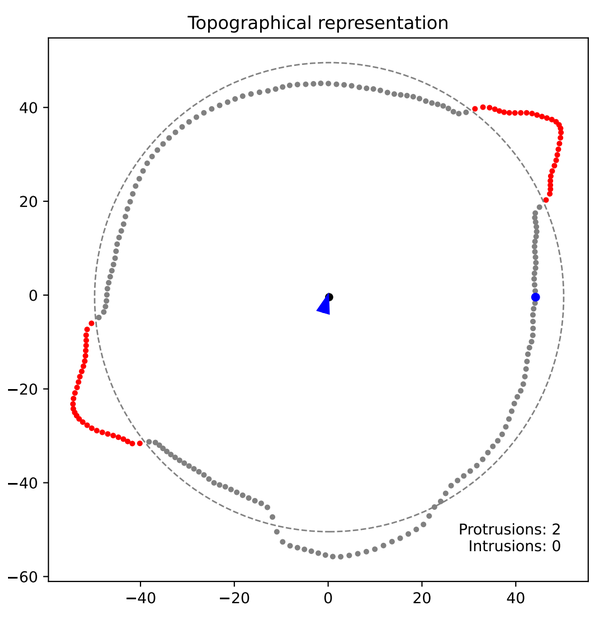

Shape evolution (t = 199.00)
Riemann Velocity: 0.1653
Max curvature: 0.0134
180
160
140
120
100
440
460
480
500

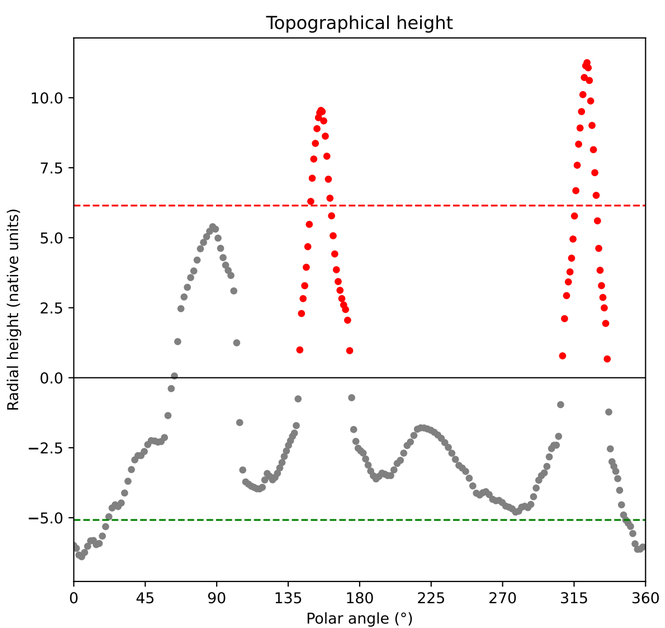

Topographical representation
Protrusions: 2
Intrusions: 0
40
20
0
−20
−40
−60
−40
−20
0
20
40

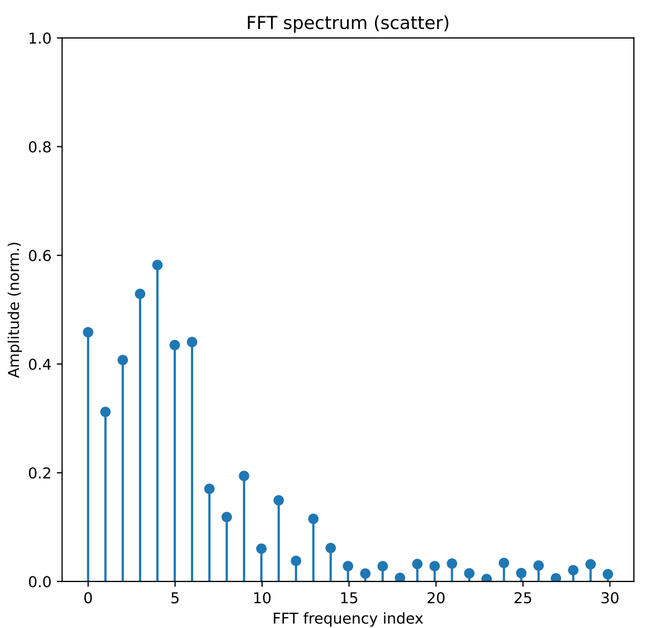

Topographical height
Radial height (native units)
Polar angle (°)
10.0
7.5
5.0
2.5
0.0
−2.5
−5.0
−7.5
0
45
90
135
180
225
270
315
360

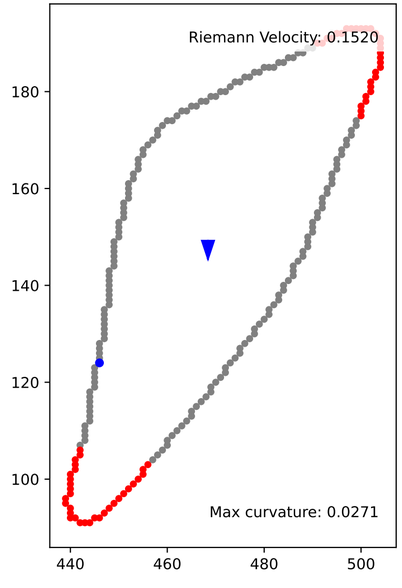

FFT spectrum (scatter)
Amplitude (norm.)
FFT frequency index
1.0
0.8
0.6
0.4
0.2
0.0
0
5
10
15
20
25
30

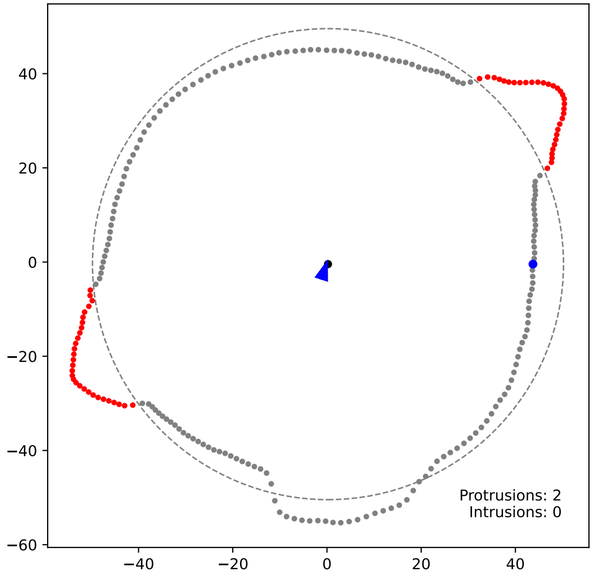

Shape evolution (t = 200.00)
Riemann Velocity: 0.1753
Max curvature: 0.0141
180
160
140
120
100
440
460
480
500

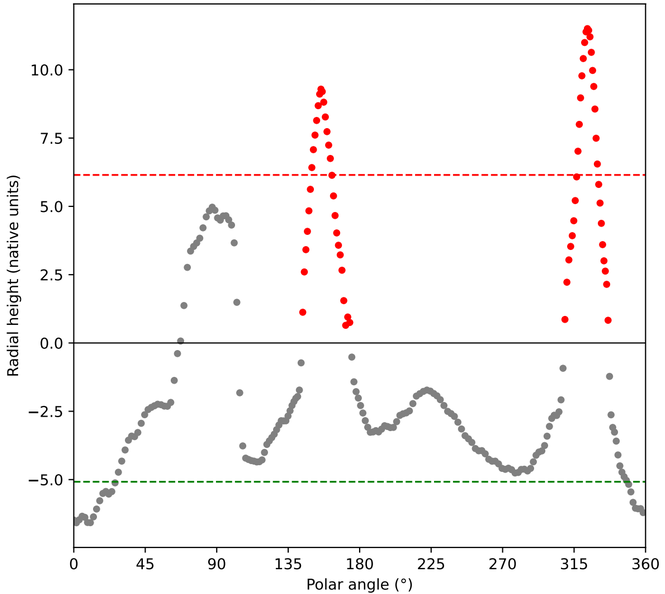

Topographical representation
Protrusions: 2
Intrusions: 0
40
20
0
−20
−40
−60
−40
−20
0
20
40

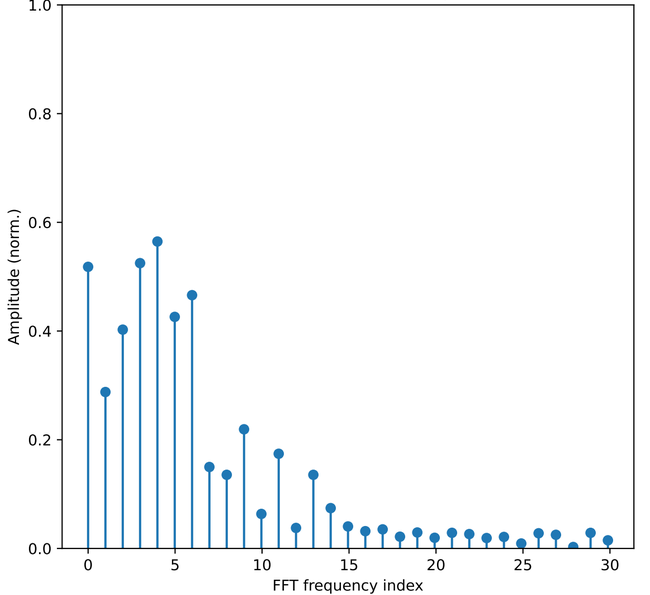

Topographical height
Radial height (native units)
Polar angle (°)
10.0
7.5
5.0
2.5
0.0
−2.5
−5.0
0
45
90
135
180
225
270
315
360

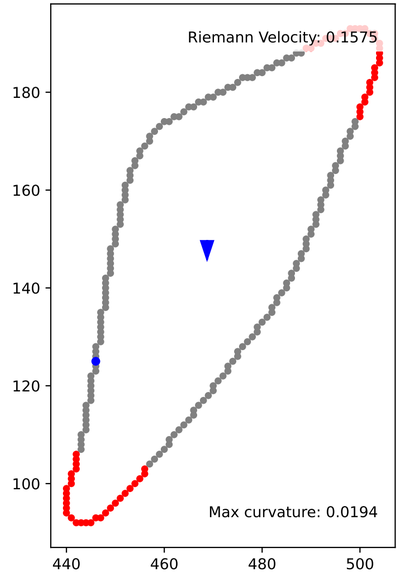

FFT spectrum (scatter)
Amplitude (norm.)
FFT frequency index
1.0
0.8
0.6
0.4
0.2
0.0
0
5
10
15
20
25
30

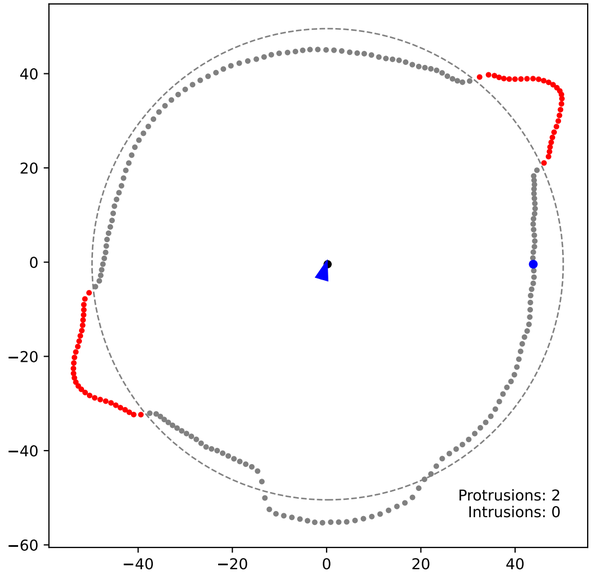

Shape evolution (t = 201.00)
Riemann Velocity: 0.1520
Max curvature: 0.0271
180
160
140
120
100
440
460
480
500

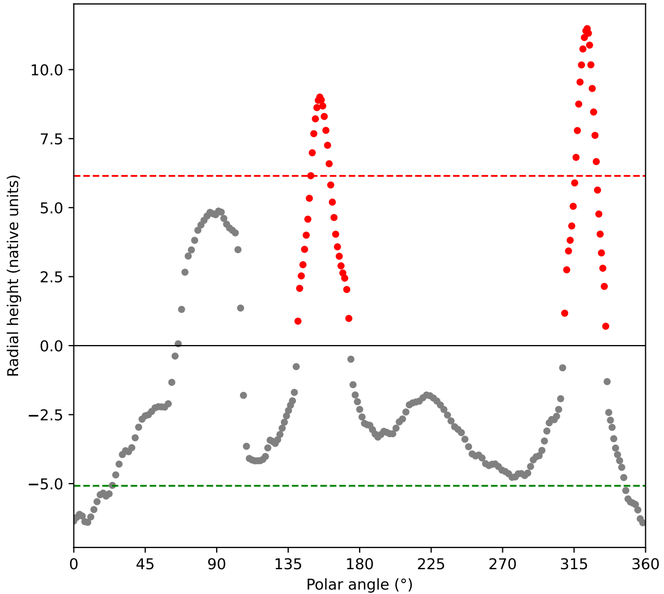

Topographical representation
Protrusions: 2
Intrusions: 0
40
20
0
−20
−40
−60
−40
−20
0
20
40

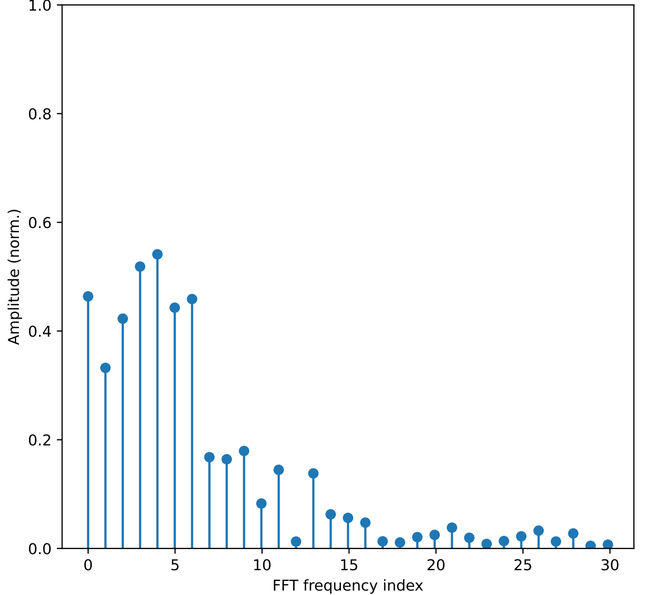

Topographical height
Radial height (native units)
Polar angle (°)
10.0
7.5
5.0
2.5
0.0
−2.5
−5.0
0
45
90
135
180
225
270
315
360

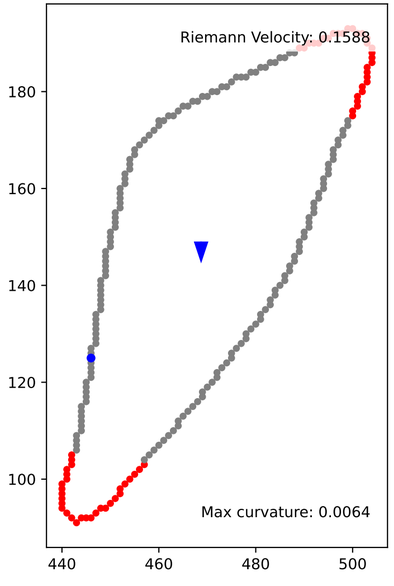

FFT spectrum (scatter)
Amplitude (norm.)
FFT frequency index
1.0
0.8
0.6
0.4
0.2
0.0
0
5
10
15
20
25
30

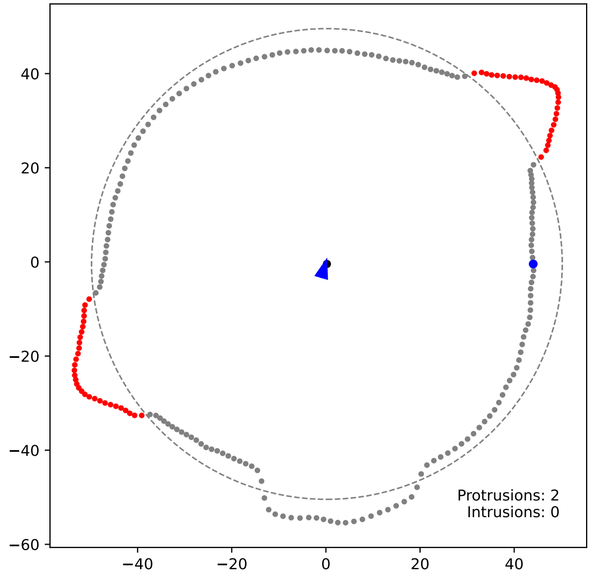

Shape evolution (t = 202.00)
Riemann Velocity: 0.1575
Max curvature: 0.0194
180
160
140
120
100
440
460
480
500

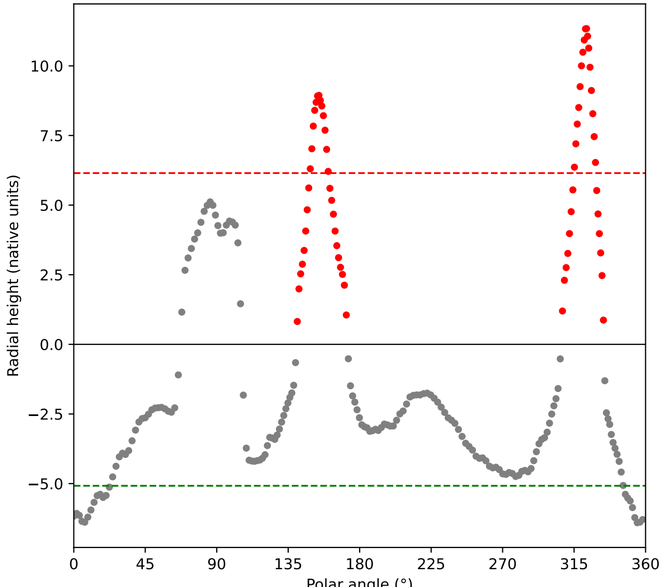

Topographical representation
Protrusions: 2
Intrusions: 0
40
20
0
−20
−40
−60
−40
−20
0
20
40

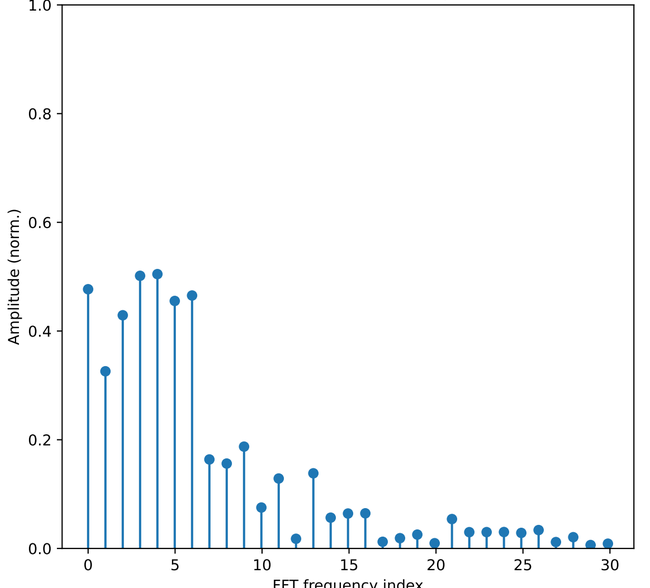

Topographical height
Radial height (native units)
Polar angle (°)
10.0
7.5
5.0
2.5
0.0
−2.5
−5.0
0
45
90
135
180
225
270
315
360

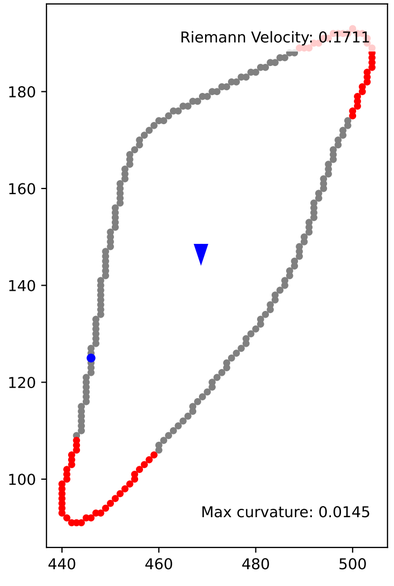

FFT spectrum (scatter)
Amplitude (norm.)
FFT frequency index
1.0
0.8
0.6
0.4
0.2
0.0
0
5
10
15
20
25
30

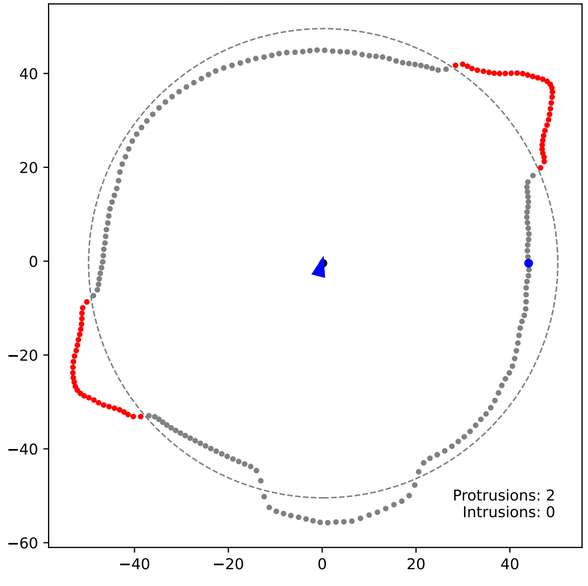

Shape evolution (t = 203.00)
Riemann Velocity: 0.1588
Max curvature: 0.0064
180
160
140
120
100
440
460
480
500

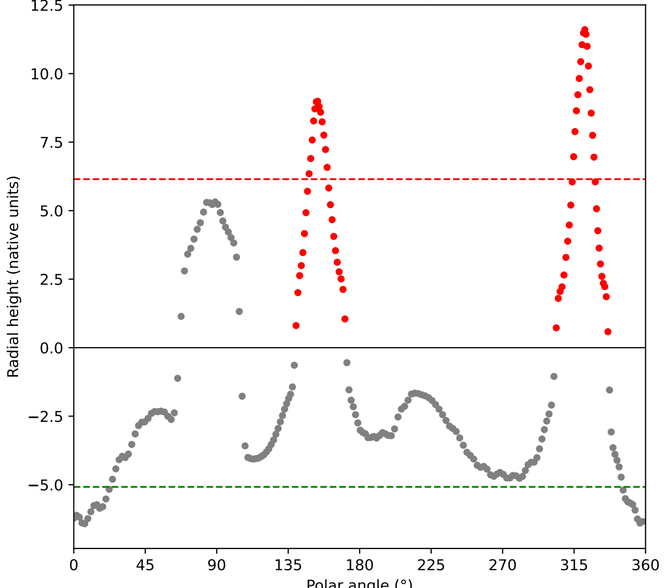

Topographical representation
Protrusions: 2
Intrusions: 0
40
20
0
−20
−40
−60
−40
−20
0
20
40

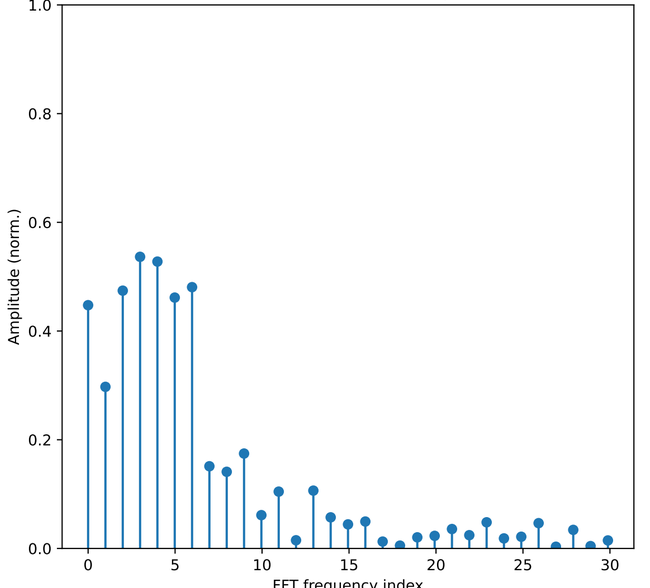

Topographical height
Radial height (native units)
Polar angle (°)
10.0
7.5
5.0
2.5
0.0
−2.5
−5.0
0
45
90
135
180
225
270
315
360

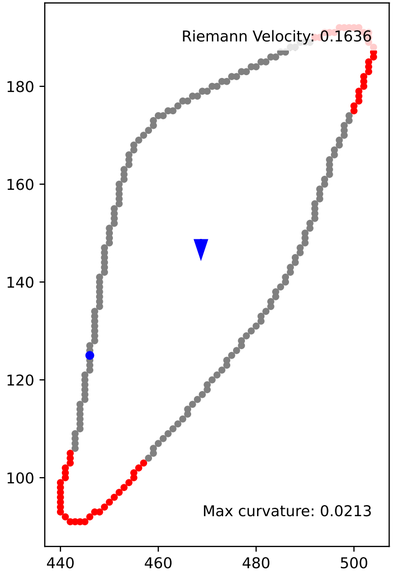

FFT spectrum (scatter)
Amplitude (norm.)
FFT frequency index
1.0
0.8
0.6
0.4
0.2
0.0
0
5
10
15
20
25
30

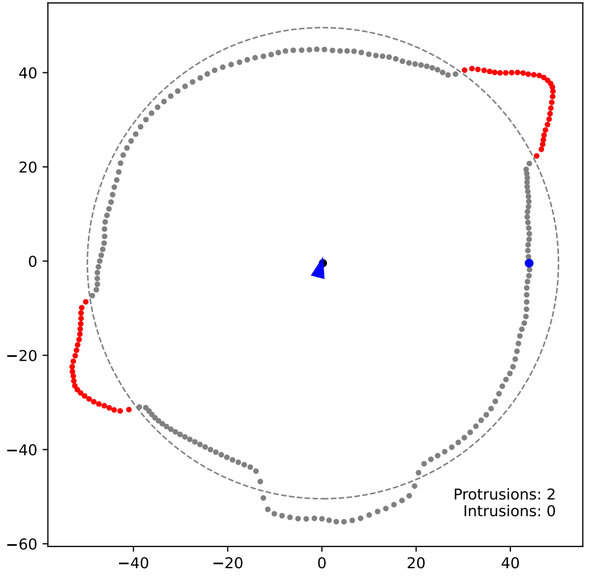

Shape evolution (t = 204.00)
Riemann Velocity: 0.1711
Max curvature: 0.0145
180
160
140
120
100
440
460
480
500

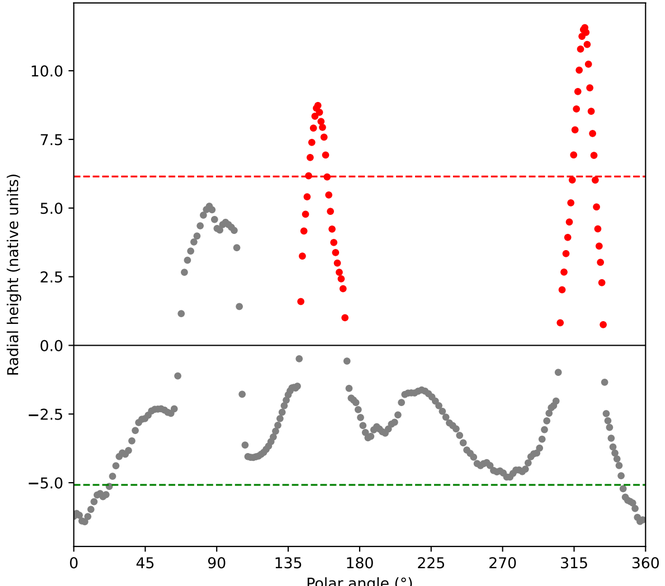

Topographical representation
Protrusions: 2
Intrusions: 0
40
20
0
−20
−40
−60
−40
−20
0
20
40

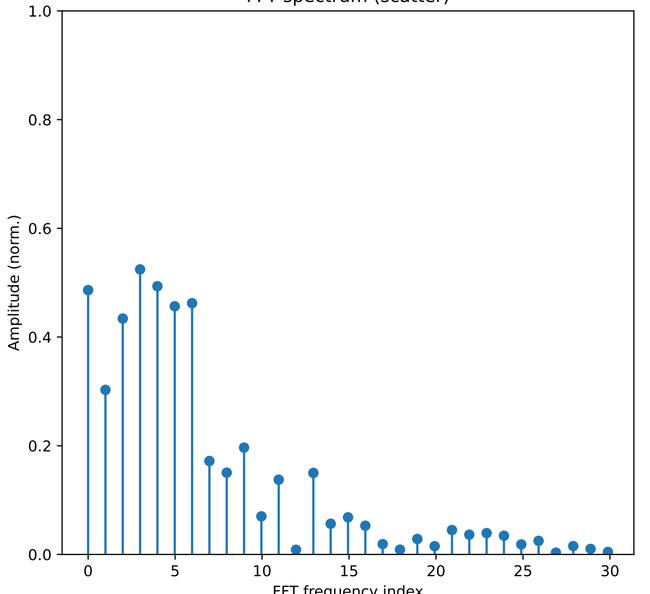

Topographical height
Radial height (native units)
Polar angle (°)
12.5
10.0
7.5
5.0
2.5
0.0
−2.5
−5.0
0
45
90
135
180
225
270
315
360

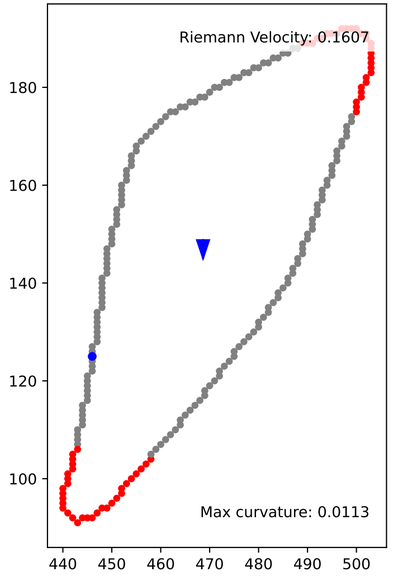

FFT spectrum (scatter)
Amplitude (norm.)
FFT frequency index
1.0
0.8
0.6
0.4
0.2
0.0
0
5
10
15
20
25
30

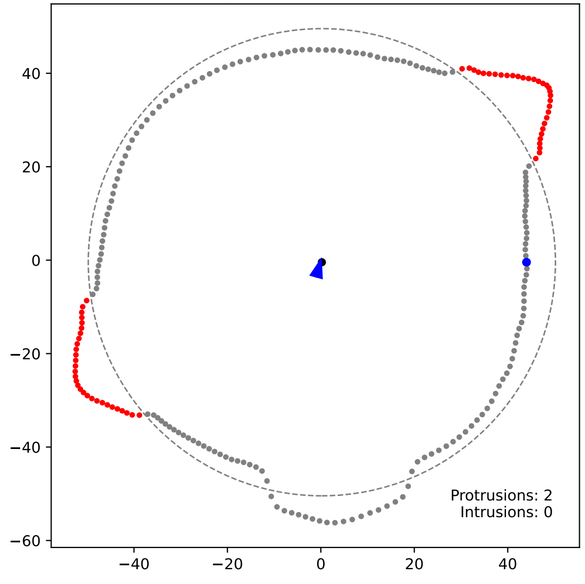

Shape evolution (t = 205.00)
Riemann Velocity: 0.1636
Max curvature: 0.0213
180
160
140
120
100
440
460
480
500

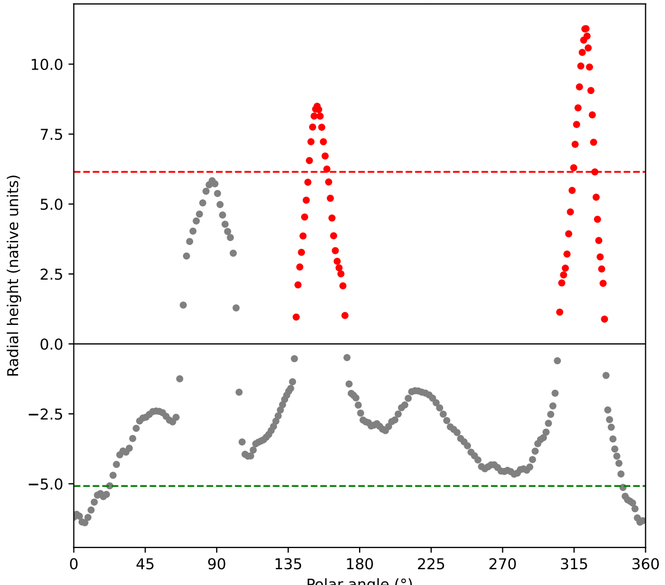

Topographical representation
Protrusions: 2
Intrusions: 0
40
20
0
−20
−40
−60
−40
−20
0
20
40

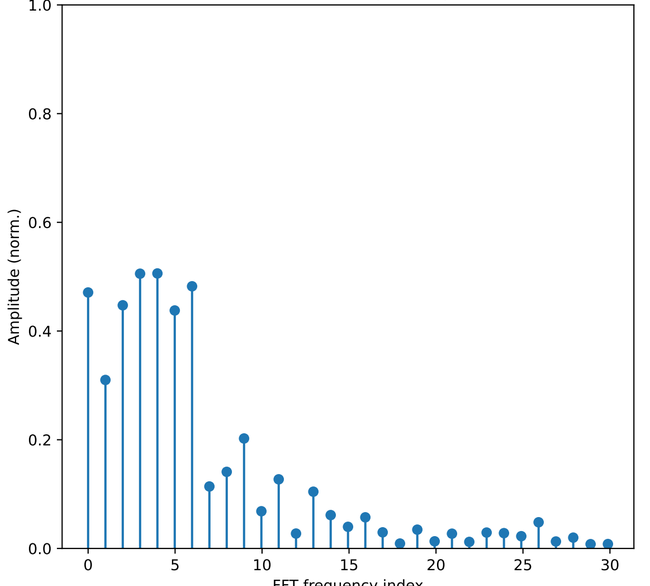

Topographical height
Radial height (native units)
Polar angle (°)
10.0
7.5
5.0
2.5
0.0
−2.5
−5.0
0
45
90
135
180
225
270
315
360

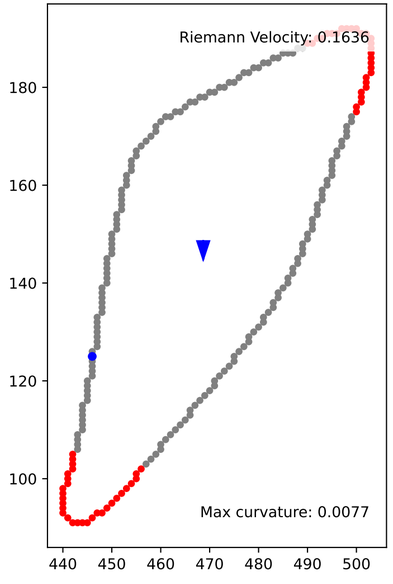

FFT spectrum (scatter)
Amplitude (norm.)
FFT frequency index
1.0
0.8
0.6
0.4
0.2
0.0
0
5
10
15
20
25
30

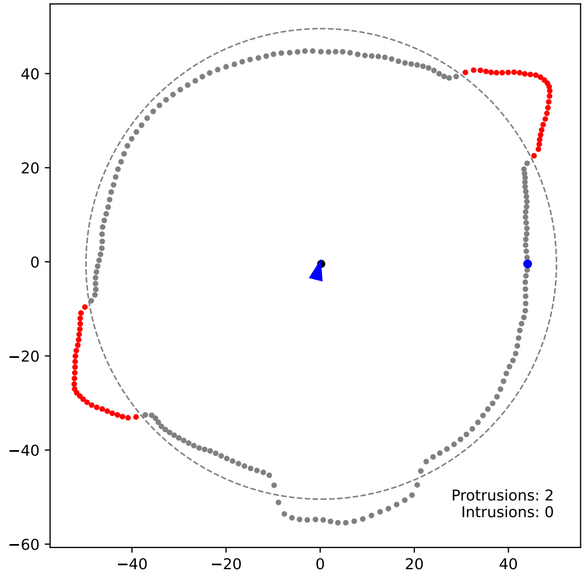

Shape evolution (t = 206.00)
Riemann Velocity: 0.1607
Max curvature: 0.0113
180
160
140
120
100
440
450
460
470
480
490
500

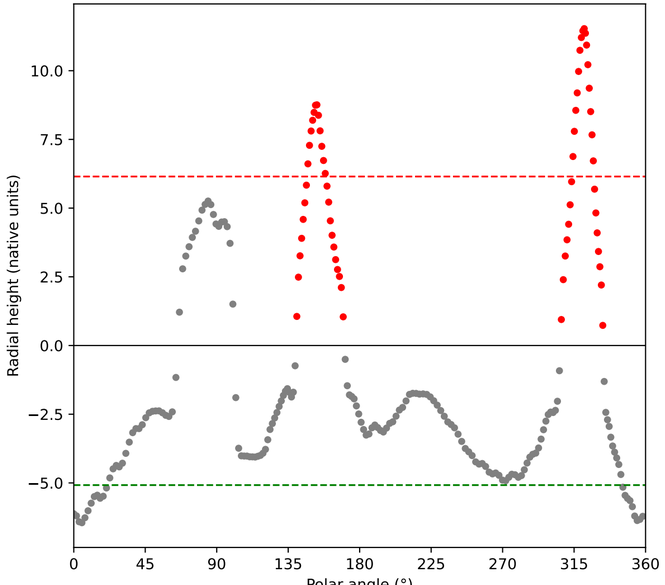

Topographical representation
Protrusions: 2
Intrusions: 0
40
20
0
−20
−40
−60
−40
−20
0
20
40

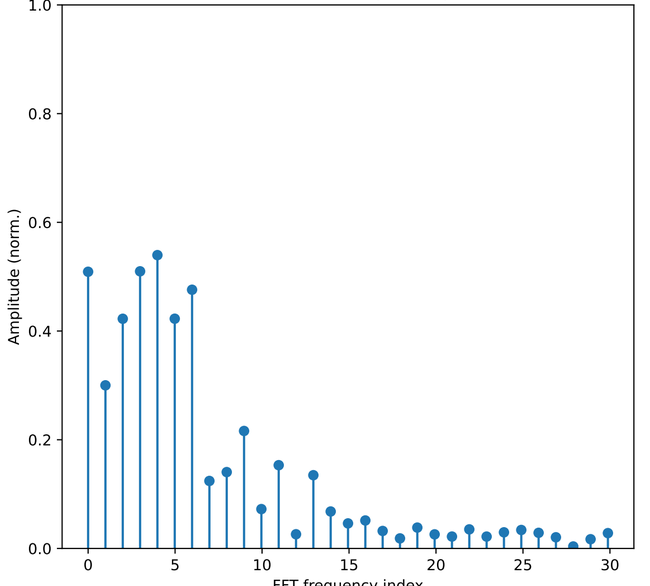

Topographical height
Radial height (native units)
Polar angle (°)
10.0
7.5
5.0
2.5
0.0
−2.5
−5.0
0
45
90
135
180
225
270
315
360

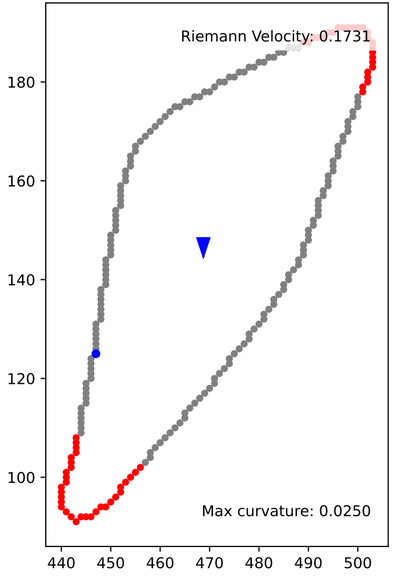

FFT spectrum (scatter)
Amplitude (norm.)
FFT frequency index
1.0
0.8
0.6
0.4
0.2
0.0
0
5
10
15
20
25
30

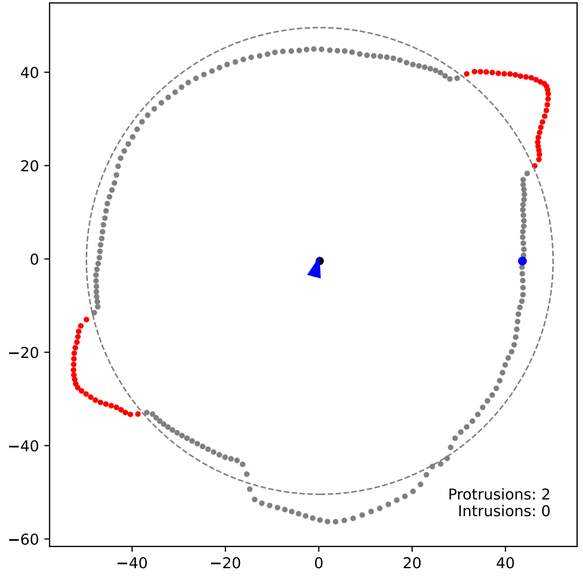

Shape evolution (t = 207.00)
Riemann Velocity: 0.1636
Max curvature: 0.0077
180
160
140
120
100
440
450
460
470
480
490
500

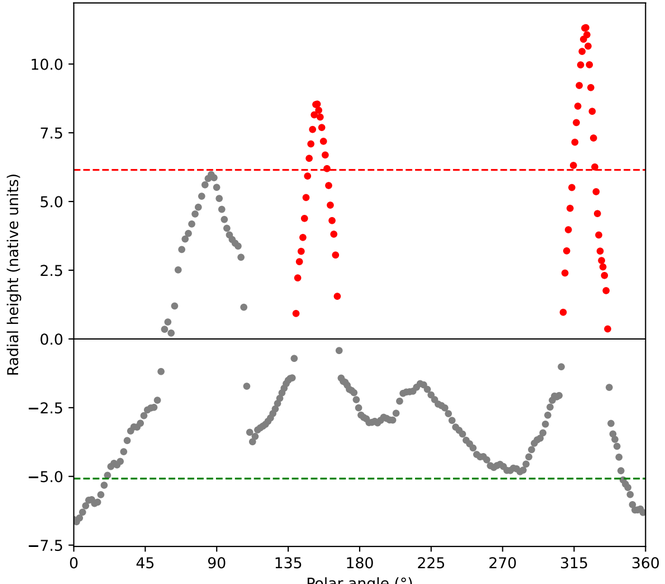

Topographical representation
Protrusions: 2
Intrusions: 0
40
20
0
−20
−40
−60
−40
−20
0
20
40

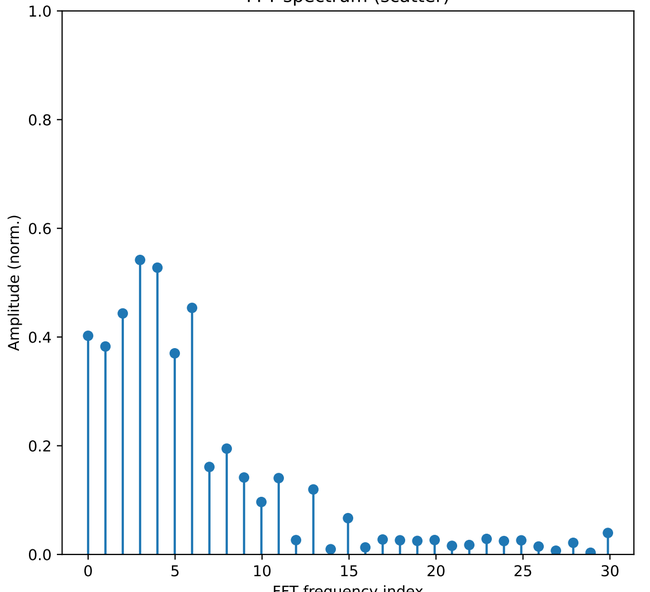

Topographical height
Radial height (native units)
Polar angle (°)
10.0
7.5
5.0
2.5
0.0
−2.5
−5.0
0
45
90
135
180
225
270
315
360

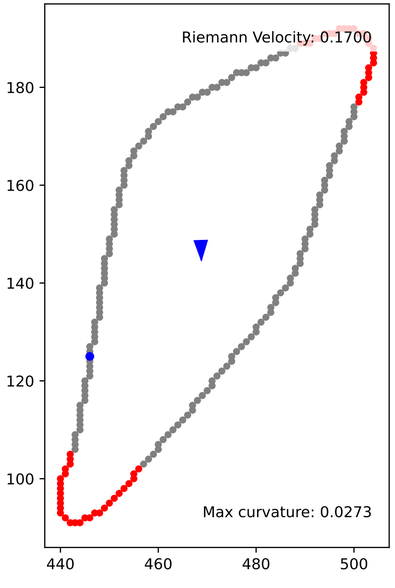

FFT spectrum (scatter)
Amplitude (norm.)
FFT frequency index
1.0
0.8
0.6
0.4
0.2
0.0
0
5
10
15
20
25
30

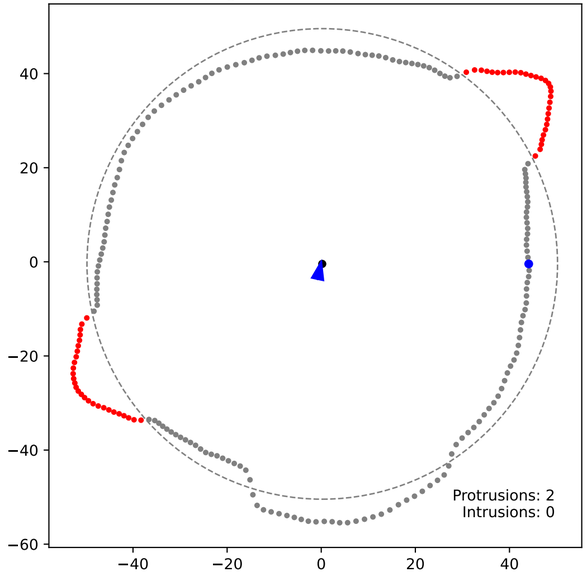

Shape evolution (t = 208.00)
Riemann Velocity: 0.1731
Max curvature: 0.0250
180
160
140
120
100
440
450
460
470
480
490
500

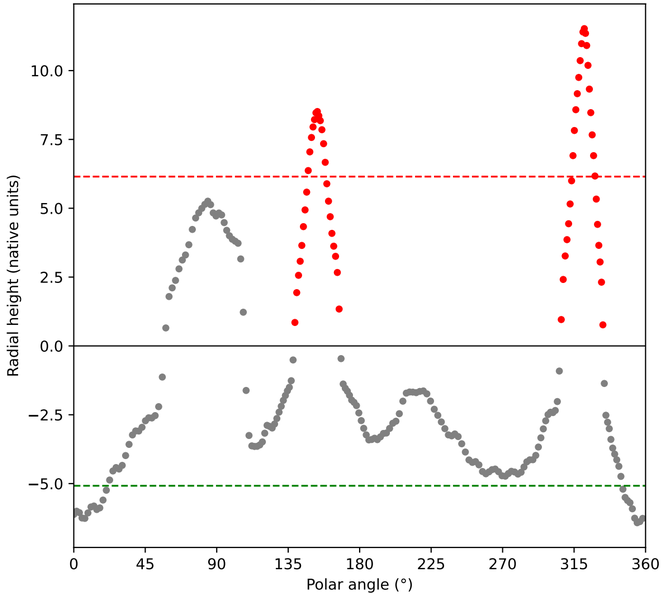

Topographical representation
Protrusions: 2
Intrusions: 0
40
20
0
−20
−40
−60
−40
−20
0
20
40

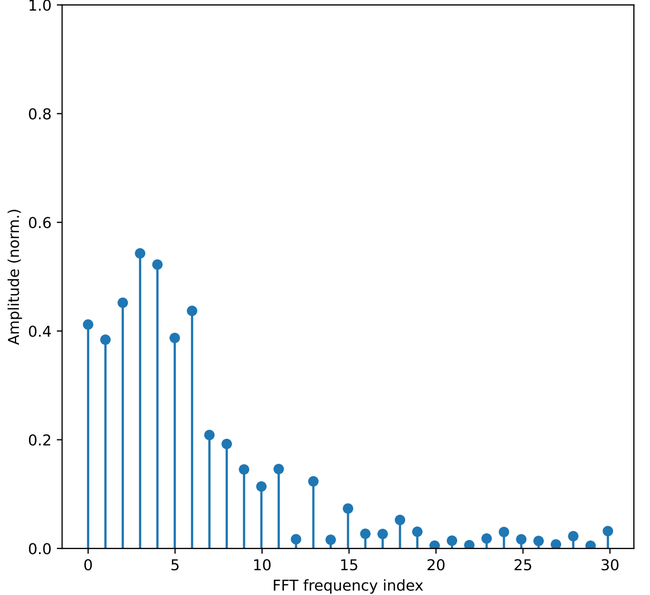

Topographical height
Radial height (native units)
Polar angle (°)
10.0
7.5
5.0
2.5
0.0
−2.5
−5.0
−7.5
0
45
90
135
180
225
270
315
360

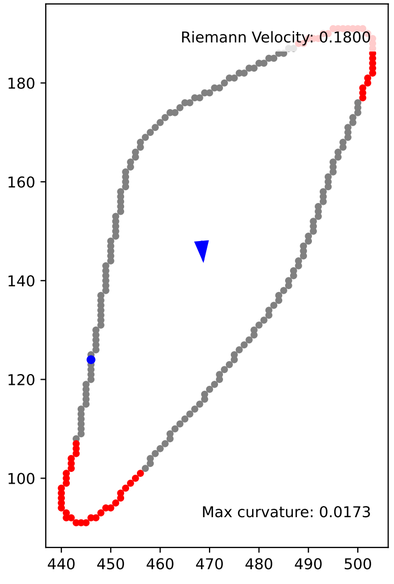

FFT spectrum (scatter)
Amplitude (norm.)
FFT frequency index
1.0
0.8
0.6
0.4
0.2
0.0
0
5
10
15
20
25
30

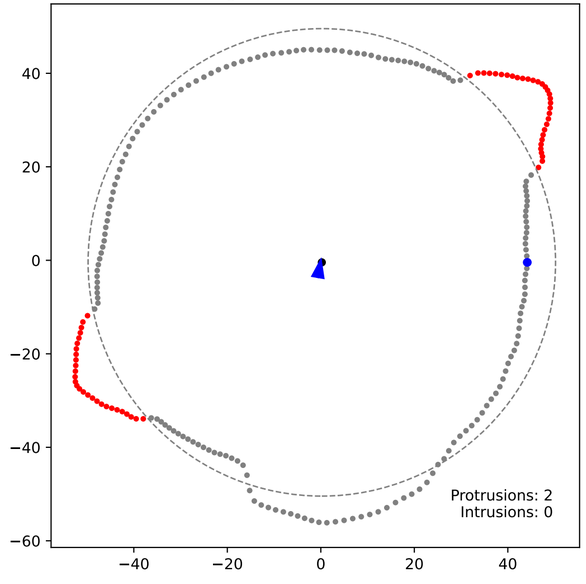

Shape evolution (t = 209.00)
Riemann Velocity: 0.1700
Max curvature: 0.0273
180
160
140
120
100
440
460
480
500

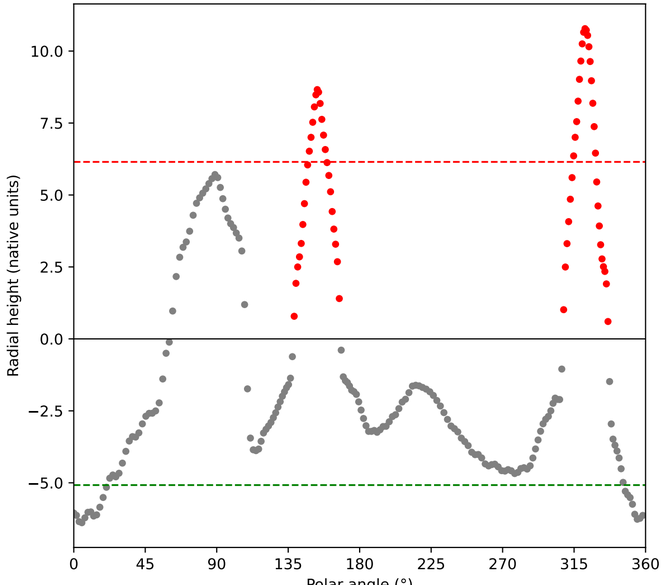

Topographical representation
Protrusions: 2
Intrusions: 0
40
20
0
−20
−40
−60
−40
−20
0
20
40

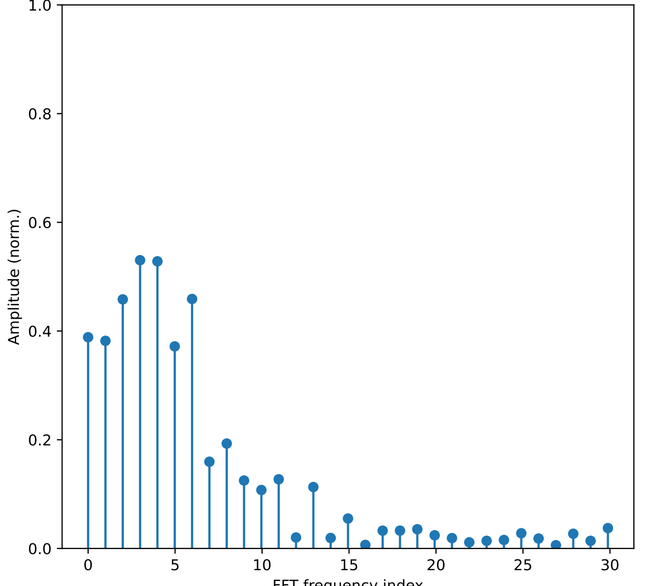

Topographical height
Radial height (native units)
Polar angle (°)
10.0
7.5
5.0
2.5
0.0
−2.5
−5.0
0
45
90
135
180
225
270
315
360

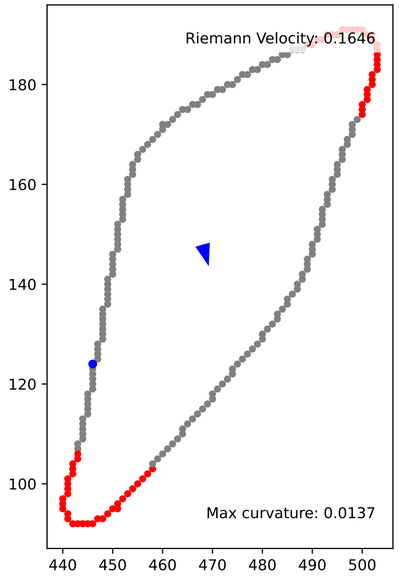

FFT spectrum (scatter)
Amplitude (norm.)
FFT frequency index
1.0
0.8
0.6
0.4
0.2
0.0
0
5
10
15
20
25
30

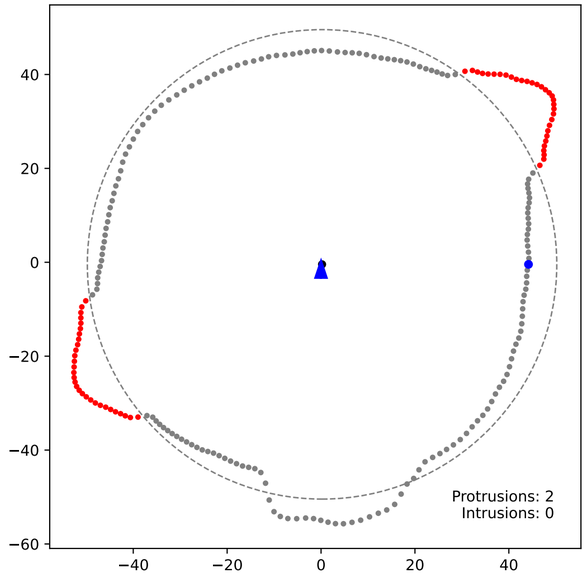

Shape evolution (t = 210.00)
Riemann Velocity: 0.1800
Max curvature: 0.0173
180
160
140
120
100
440
450
460
470
480
490
500

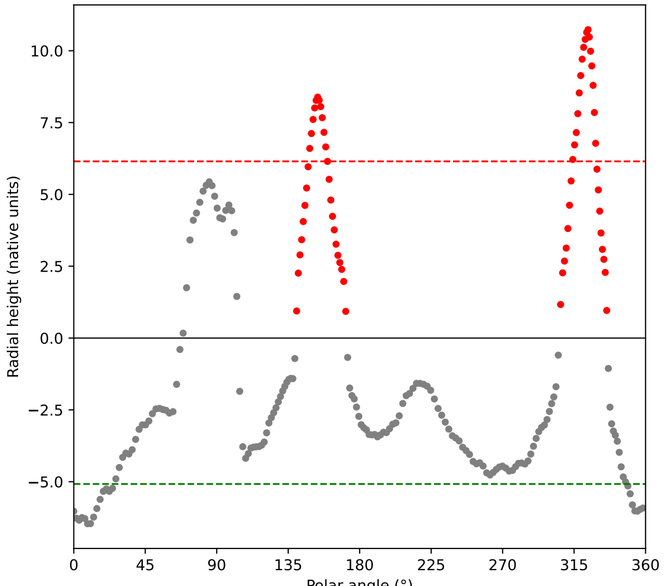

Topographical representation
Protrusions: 2
Intrusions: 0
40
20
0
−20
−40
−60
−40
−20
0
20
40

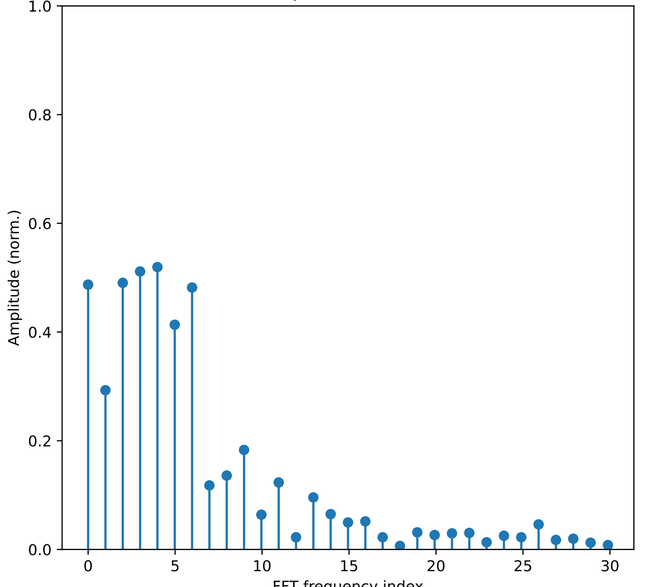

Topographical height
Radial height (native units)
Polar angle (°)
10.0
7.5
5.0
2.5
0.0
−2.5
−5.0
0
45
90
135
180
225
270
315
360

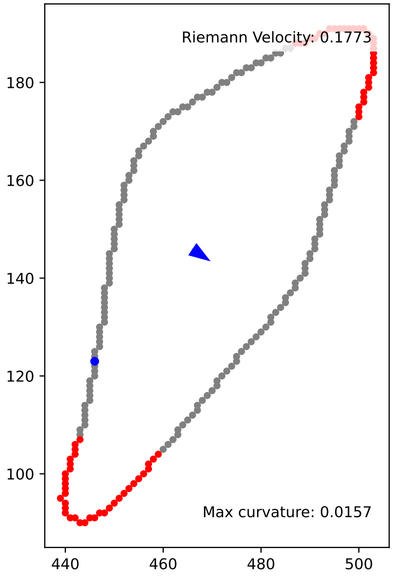

FFT spectrum (scatter)
Amplitude (norm.)
FFT frequency index
1.0
0.8
0.6
0.4
0.2
0.0
0
5
10
15
20
25
30

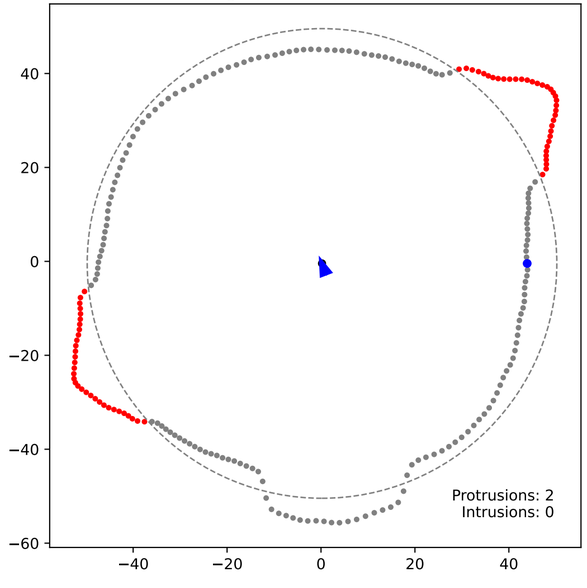

Shape evolution (t = 211.00)
Riemann Velocity: 0.1646
Max curvature: 0.0137
180
160
140
120
100
440
450
460
470
480
490
500

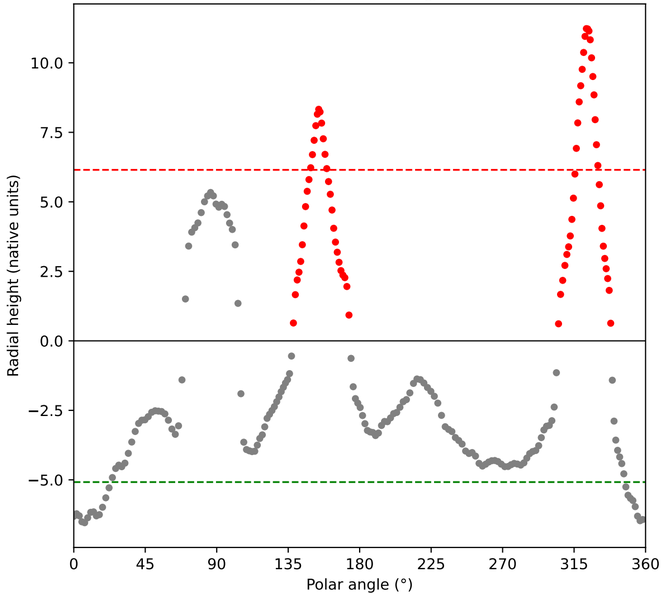

Topographical representation
Protrusions: 2
Intrusions: 0
40
20
0
−20
−40
−60
−40
−20
0
20
40

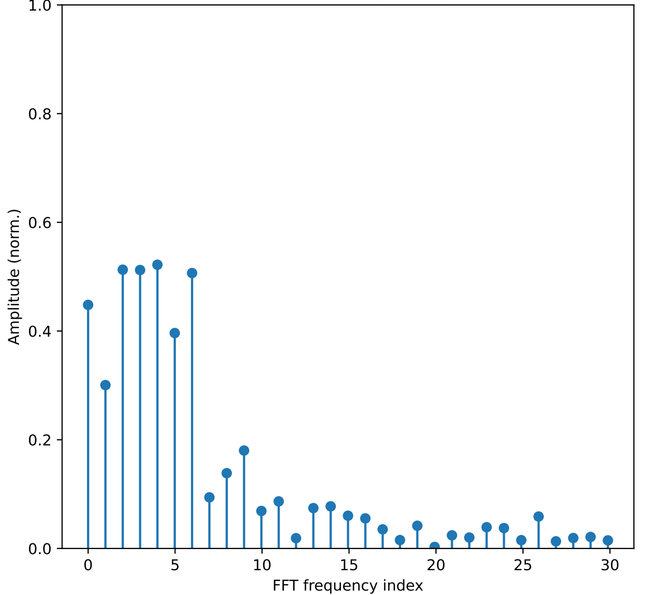

Topographical height
Radial height (native units)
Polar angle (°)
10.0
7.5
5.0
2.5
0.0
−2.5
−5.0
0
45
90
135
180
225
270
315
360

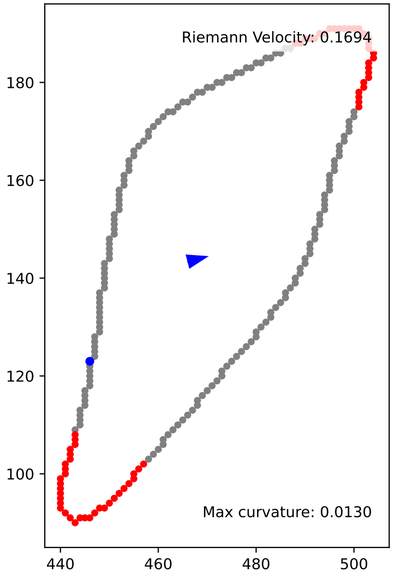

FFT spectrum (scatter)
Amplitude (norm.)
FFT frequency index
1.0
0.8
0.6
0.4
0.2
0.0
0
5
10
15
20
25
30

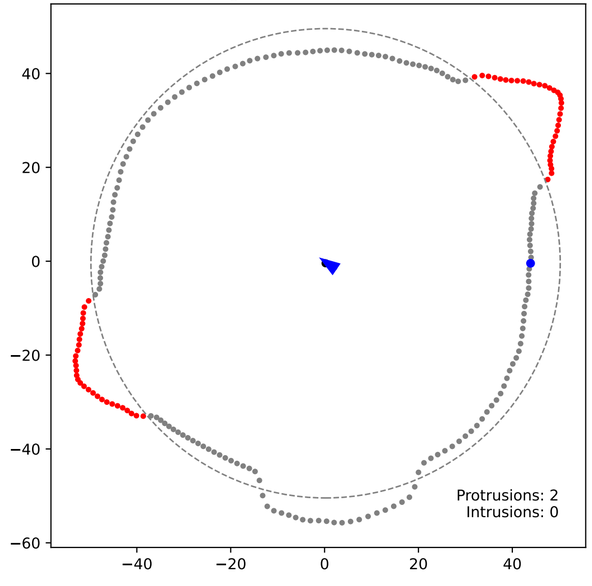

Shape evolution (t = 212.00)
Riemann Velocity: 0.1773
Max curvature: 0.0157
180
160
140
120
100
440
460
480
500

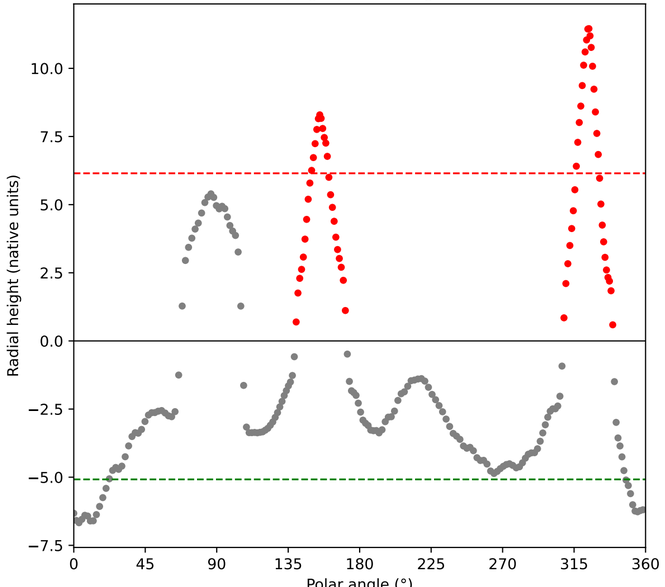

Topographical representation
Protrusions: 2
Intrusions: 0
40
20
0
−20
−40
−60
−40
−20
0
20
40

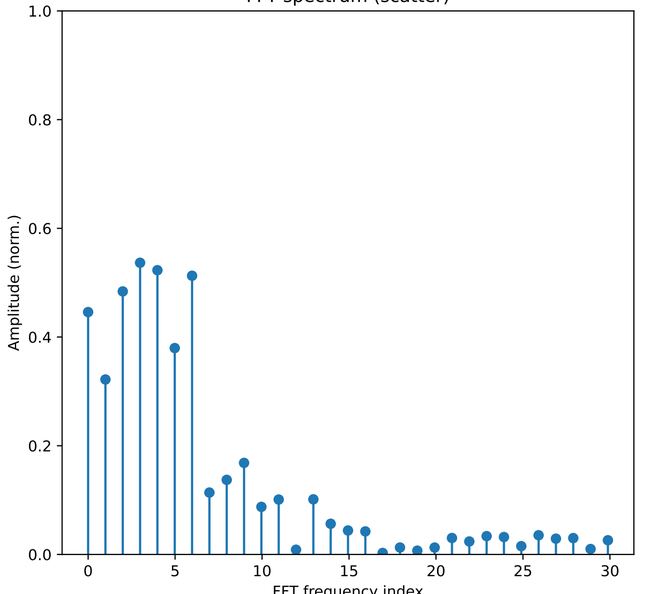

Topographical height
Radial height (native units)
Polar angle (°)
10.0
7.5
5.0
2.5
0.0
−2.5
−5.0
0
45
90
135
180
225
270
315
360

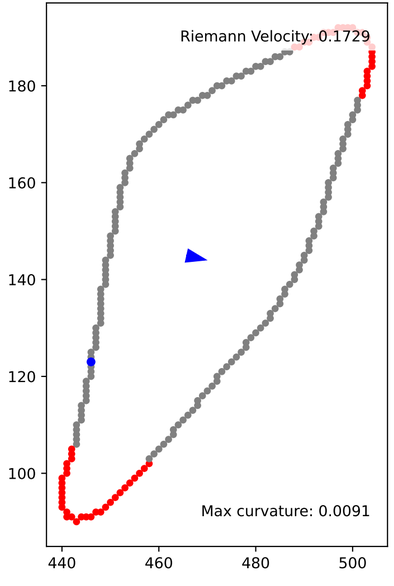

FFT spectrum (scatter)
Amplitude (norm.)
FFT frequency index
1.0
0.8
0.6
0.4
0.2
0.0
0
5
10
15
20
25
30

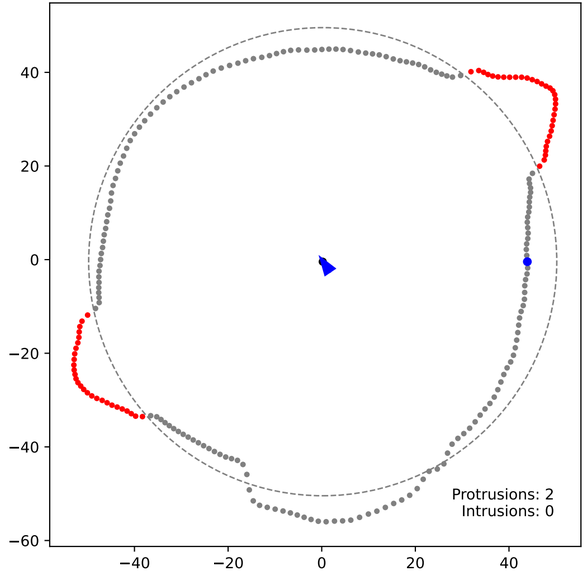

Shape evolution (t = 213.00)
Riemann Velocity: 0.1694
Max curvature: 0.0130
180
160
140
120
100
440
460
480
500

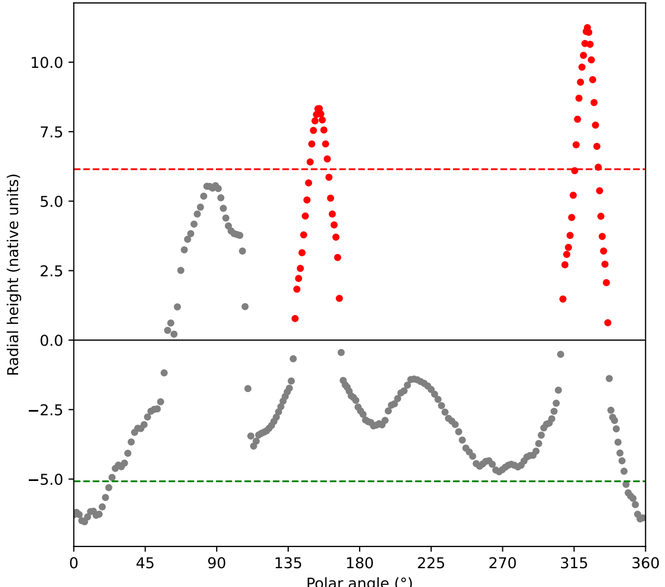

Topographical representation
Protrusions: 2
Intrusions: 0
40
20
0
−20
−40
−60
−40
−20
0
20
40

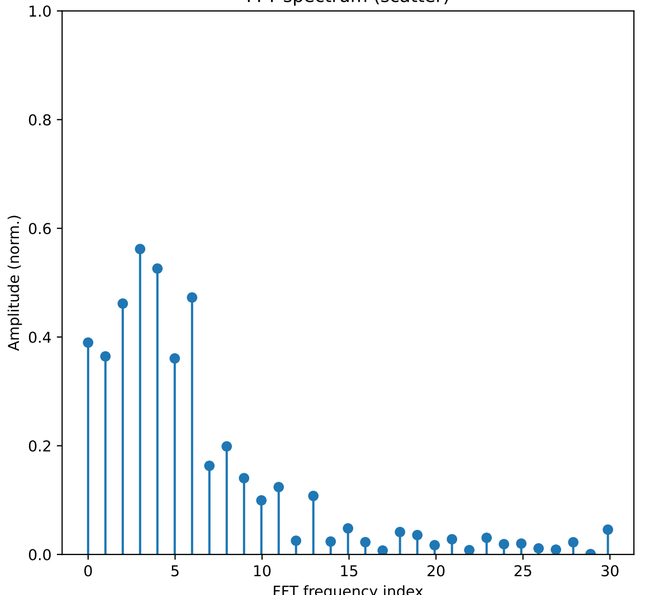

Topographical height
Radial height (native units)
Polar angle (°)
10.0
7.5
5.0
2.5
0.0
−2.5
−5.0
−7.5
0
45
90
135
180
225
270
315
360

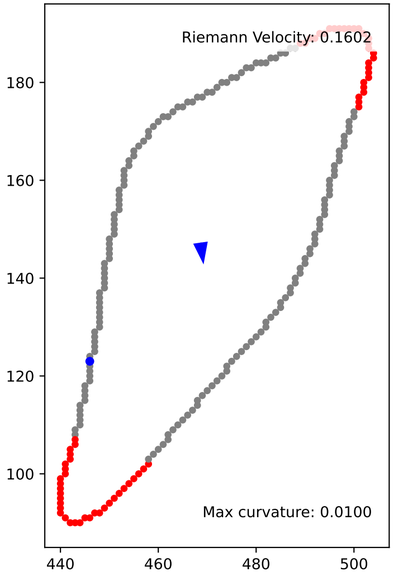

FFT spectrum (scatter)
Amplitude (norm.)
FFT frequency index
1.0
0.8
0.6
0.4
0.2
0.0
0
5
10
15
20
25
30

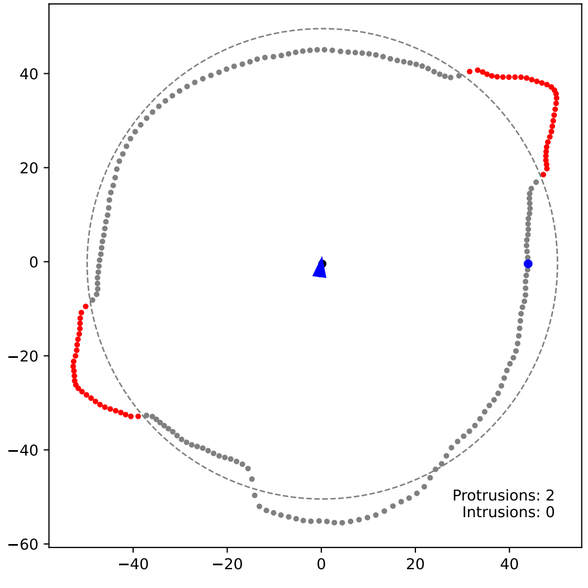

Shape evolution (t = 214.00)
Riemann Velocity: 0.1729
Max curvature: 0.0091
180
160
140
120
100
440
460
480
500

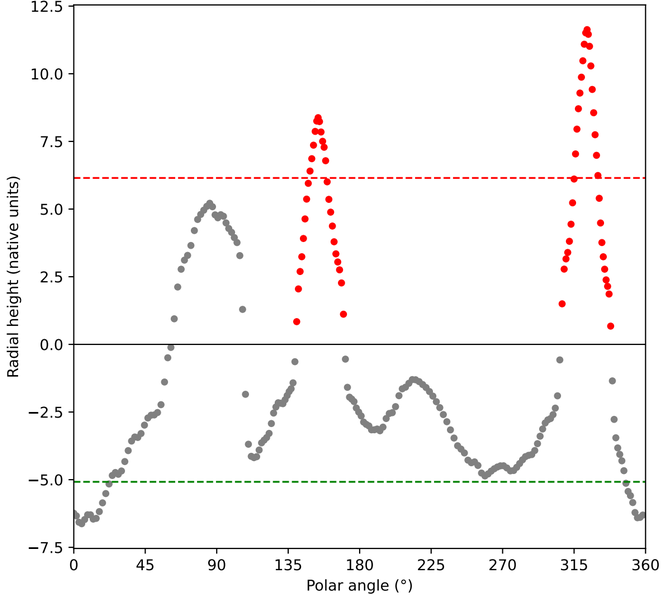

Topographical representation
Protrusions: 2
Intrusions: 0
40
20
0
−20
−40
−60
−40
−20
0
20
40

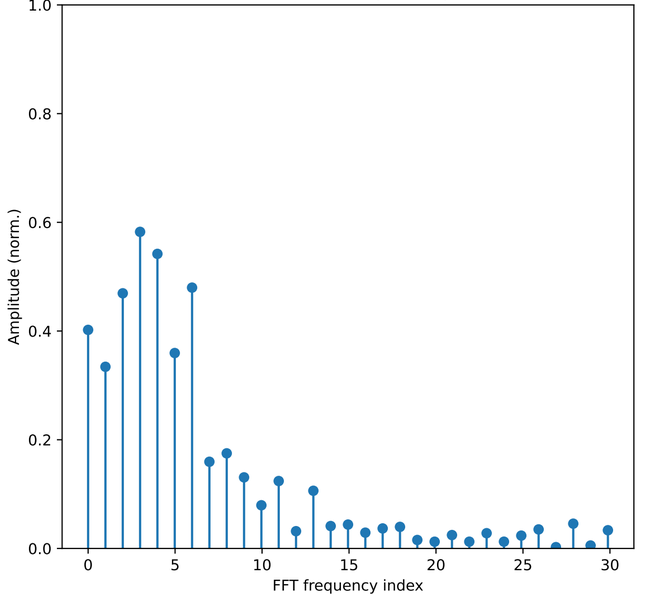

Topographical height
Radial height (native units)
Polar angle (°)
10.0
7.5
5.0
2.5
0.0
−2.5
−5.0
0
45
90
135
180
225
270
315
360

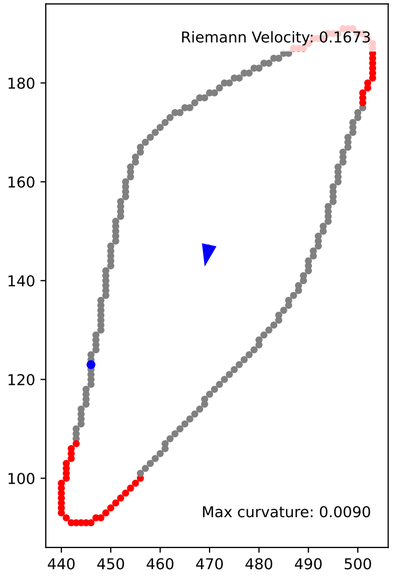

FFT spectrum (scatter)
Amplitude (norm.)
FFT frequency index
1.0
0.8
0.6
0.4
0.2
0.0
0
5
10
15
20
25
30

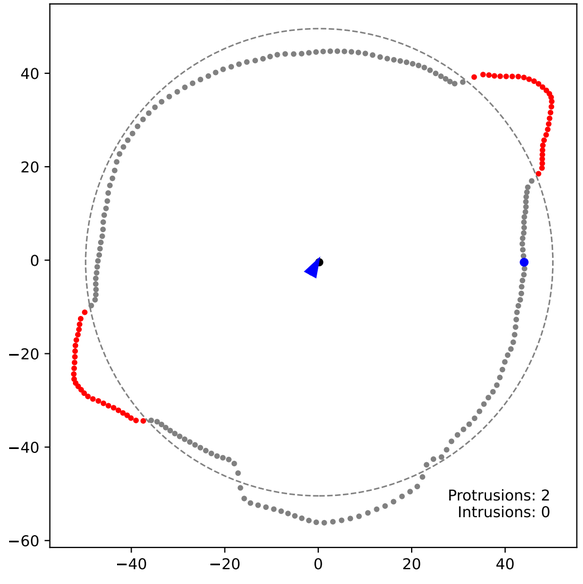

Shape evolution (t = 215.00)
Riemann Velocity: 0.1602
Max curvature: 0.0100
180
160
140
120
100
440
460
480
500

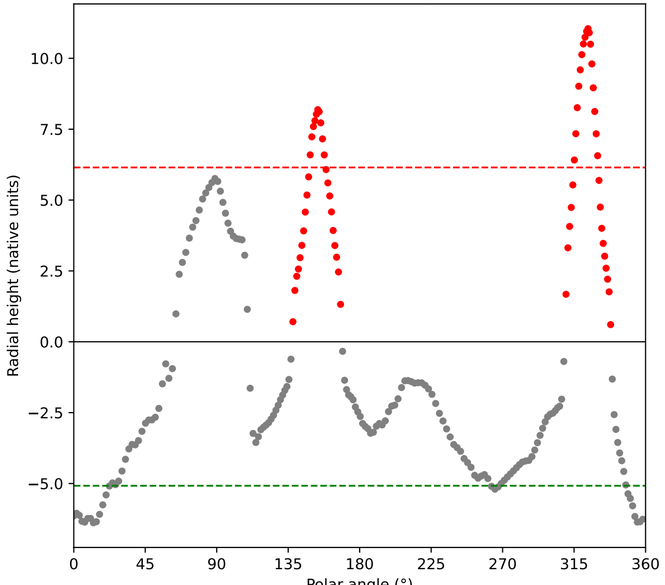

Topographical representation
Protrusions: 2
Intrusions: 0
40
20
0
−20
−40
−60
−40
−20
0
20
40

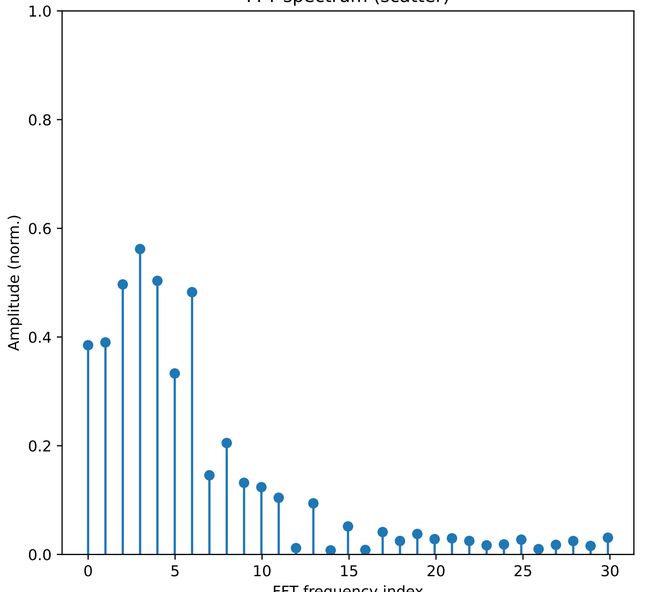

Topographical height
Radial height (native units)
Polar angle (°)
12.5
10.0
7.5
5.0
2.5
0.0
−2.5
−5.0
−7.5
0
45
90
135
180
225
270
315
360

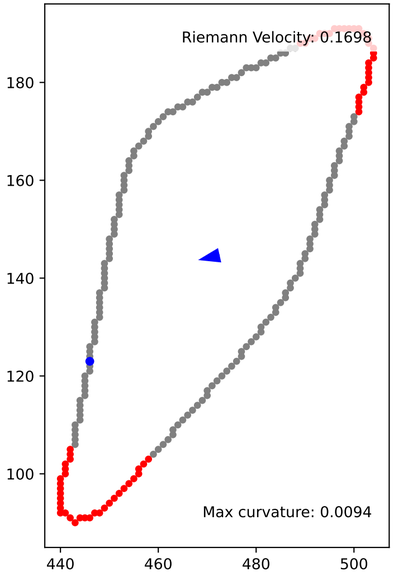

FFT spectrum (scatter)
Amplitude (norm.)
FFT frequency index
1.0
0.8
0.6
0.4
0.2
0.0
0
5
10
15
20
25
30

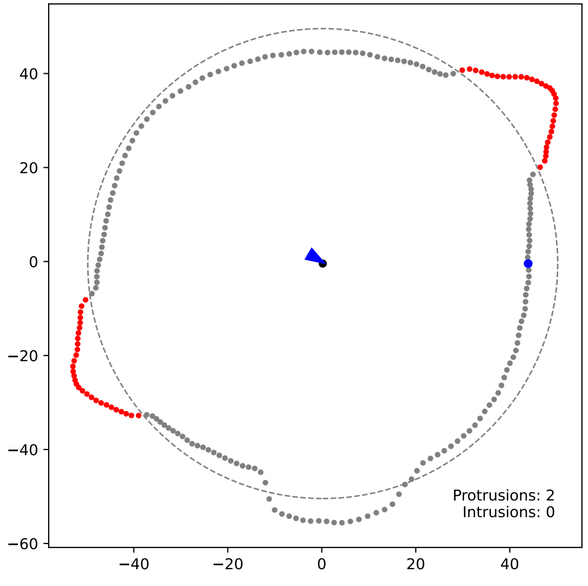

Shape evolution (t = 216.00)
Riemann Velocity: 0.1673
Max curvature: 0.0090
180
160
140
120
100
440
450
460
470
480
490
500

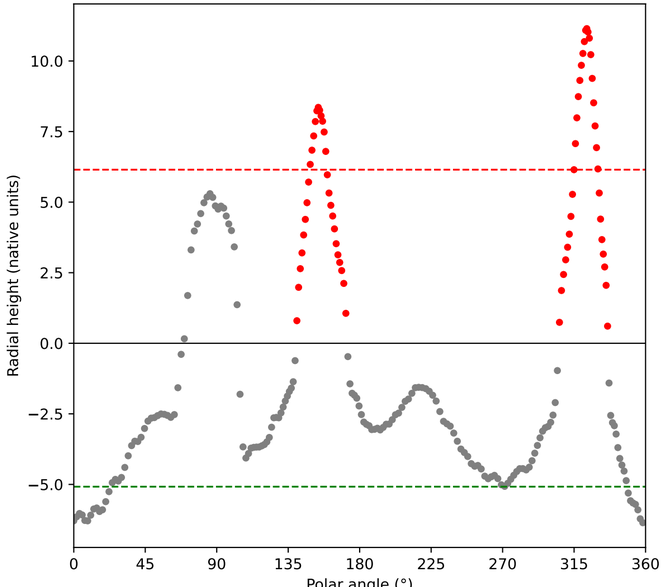

Topographical representation
Protrusions: 2
Intrusions: 0
40
20
0
−20
−40
−60
−40
−20
0
20
40

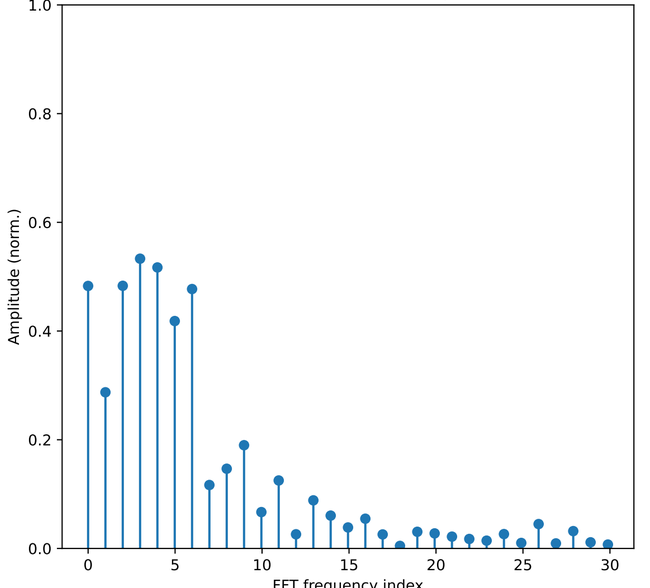

Topographical height
Radial height (native units)
Polar angle (°)
10.0
7.5
5.0
2.5
0.0
−2.5
−5.0
0
45
90
135
180
225
270
315
360

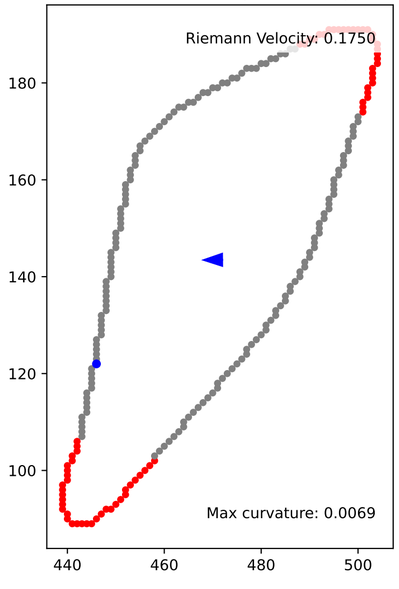

FFT spectrum (scatter)
Amplitude (norm.)
FFT frequency index
1.0
0.8
0.6
0.4
0.2
0.0
0
5
10
15
20
25
30

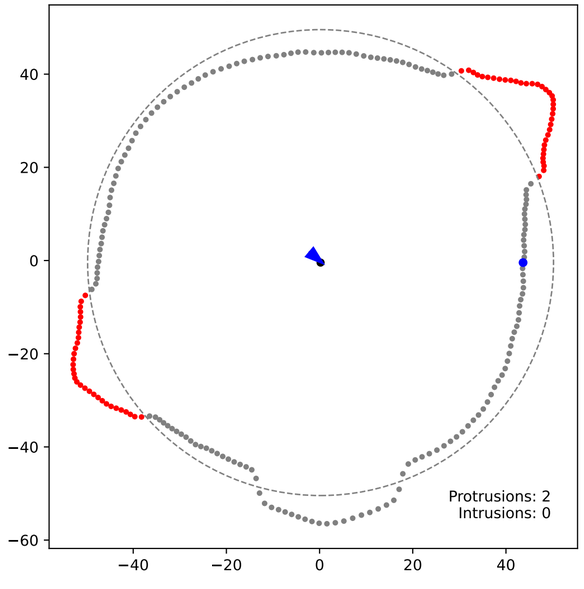

Shape evolution (t = 217.00)
Riemann Velocity: 0.1698
Max curvature: 0.0094
180
160
140
120
100
440
460
480
500

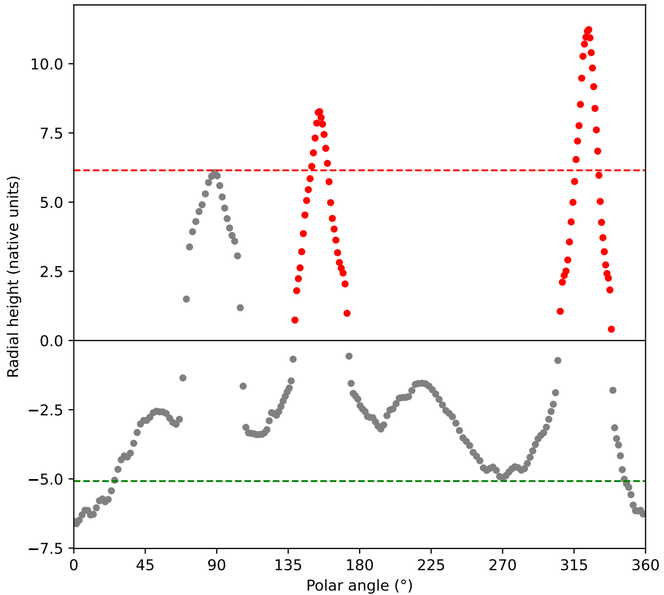

Topographical representation
Protrusions: 2
Intrusions: 0
40
20
0
−20
−40
−60
−40
−20
0
20
40

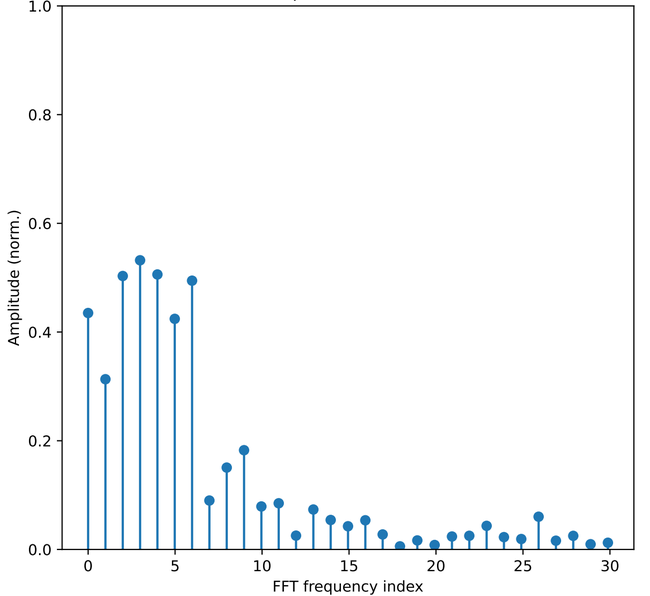

Topographical height
Radial height (native units)
Polar angle (°)
10.0
7.5
5.0
2.5
0.0
−2.5
−5.0
0
45
90
135
180
225
270
315
360

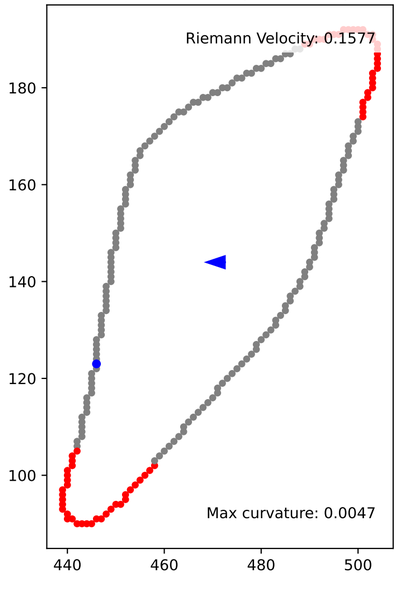

FFT spectrum (scatter)
Amplitude (norm.)
FFT frequency index
1.0
0.8
0.6
0.4
0.2
0.0
0
5
10
15
20
25
30

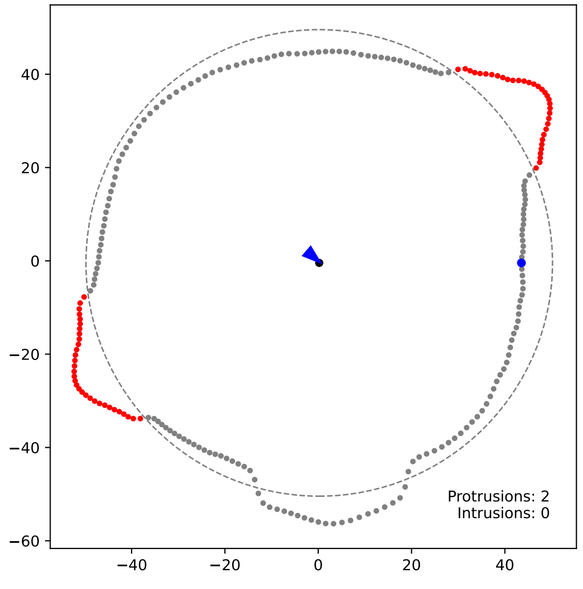

Shape evolution (t = 218.00)
Riemann Velocity: 0.1750
Max curvature: 0.0069
180
160
140
120
100
440
460
480
500

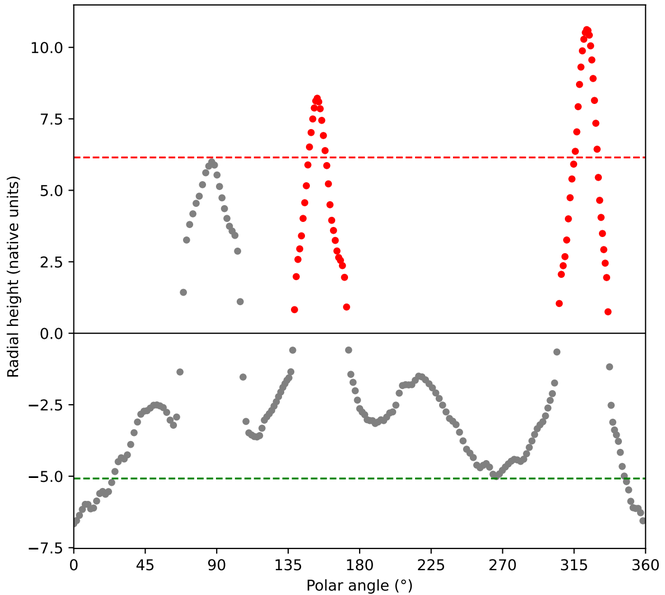

Topographical representation
Protrusions: 2
Intrusions: 0
40
20
0
−20
−40
−60
−40
−20
0
20
40

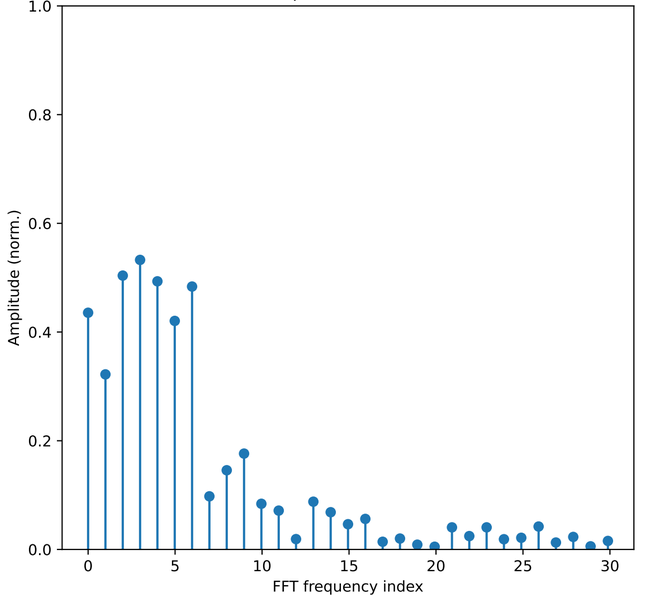

Topographical height
Radial height (native units)
Polar angle (°)
10.0
7.5
5.0
2.5
0.0
−2.5
−5.0
−7.5
0
45
90
135
180
225
270
315
360

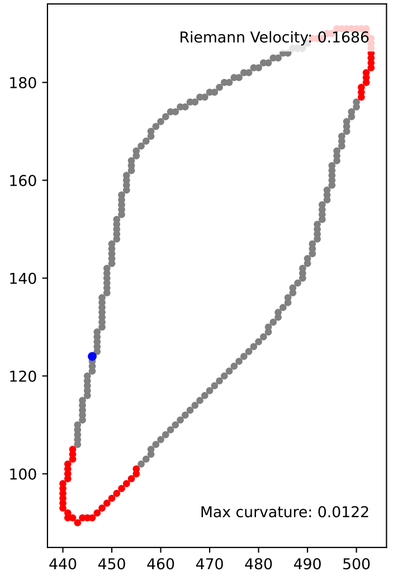

FFT spectrum (scatter)
Amplitude (norm.)
FFT frequency index
1.0
0.8
0.6
0.4
0.2
0.0
0
5
10
15
20
25
30

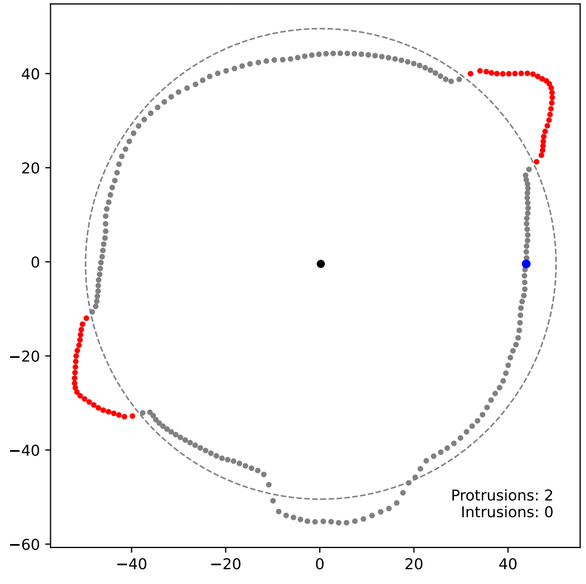

Shape evolution (t = 219.00)
Riemann Velocity: 0.1577
Max curvature: 0.0047
180
160
140
120
100
440
460
480
500

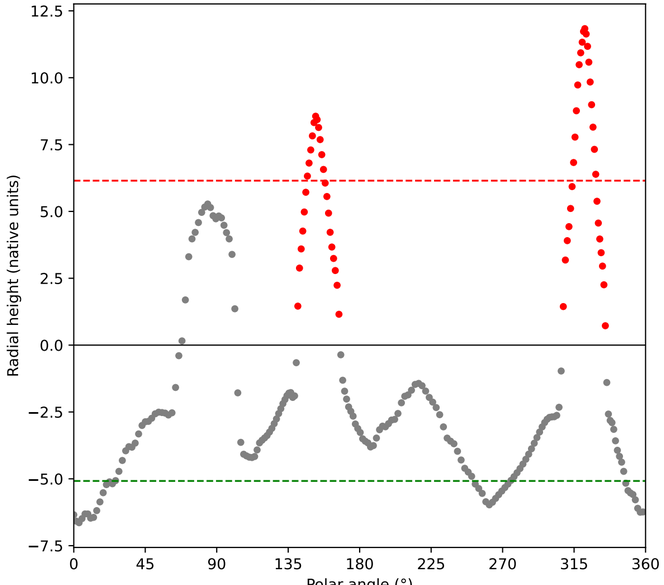

Topographical representation
Protrusions: 2
Intrusions: 0
40
20
0
−20
−40
−60
−40
−20
0
20
40

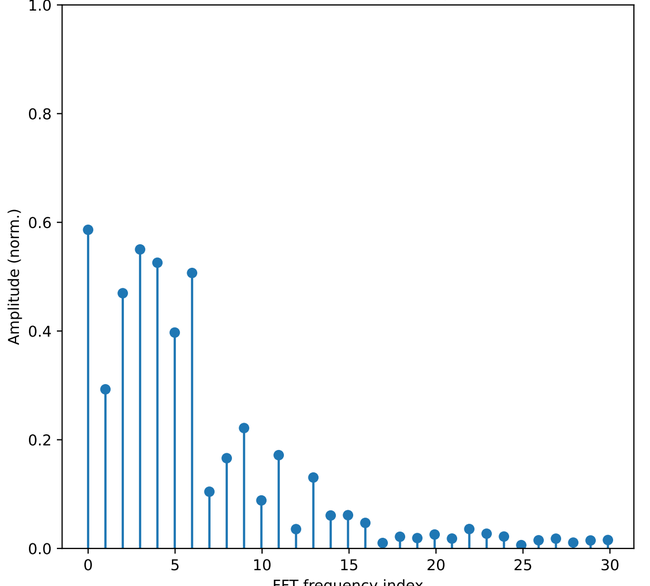

Topographical height
Radial height (native units)
Polar angle (°)
10.0
7.5
5.0
2.5
0.0
−2.5
−5.0
−7.5
0
45
90
135
180
225
270
315
360

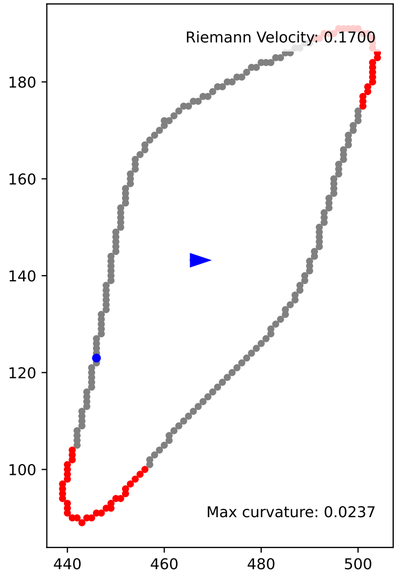

FFT spectrum (scatter)
Amplitude (norm.)
FFT frequency index
1.0
0.8
0.6
0.4
0.2
0.0
0
5
10
15
20
25
30

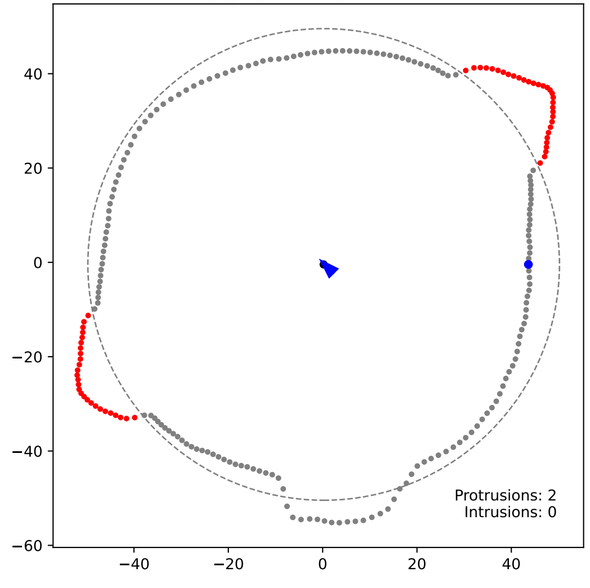

Shape evolution (t = 220.00)
Riemann Velocity: 0.1686
Max curvature: 0.0122
180
160
140
120
100
440
450
460
470
480
490
500

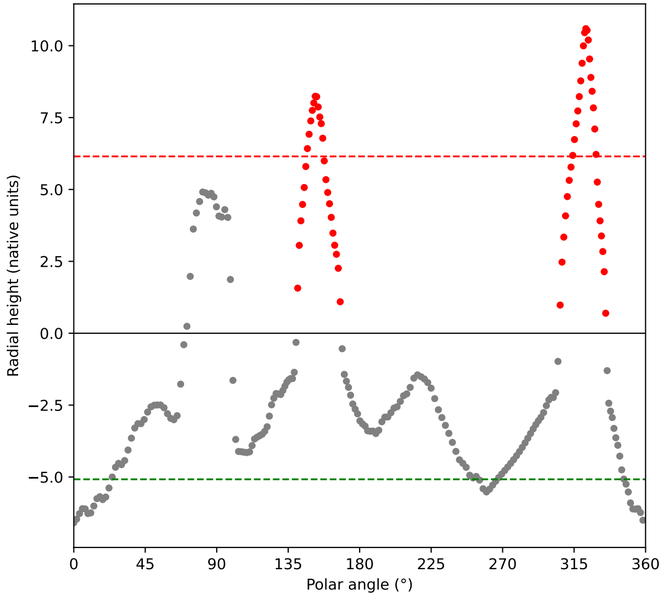

Topographical representation
Protrusions: 2
Intrusions: 0
40
20
0
−20
−40
−60
−40
−20
0
20
40

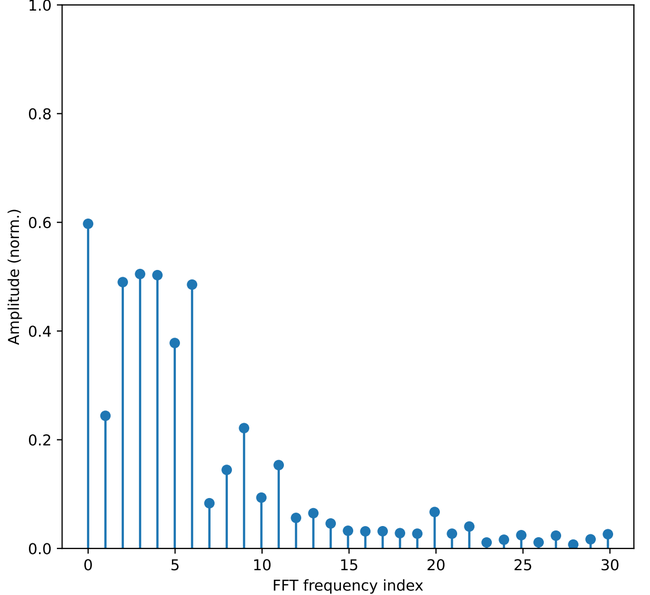

Topographical height
Radial height (native units)
Polar angle (°)
12.5
10.0
7.5
5.0
2.5
0.0
−2.5
−5.0
−7.5
0
45
90
135
180
225
270
315
360

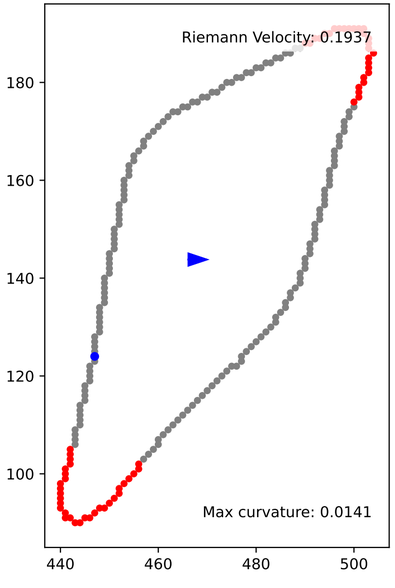

FFT spectrum (scatter)
Amplitude (norm.)
FFT frequency index
1.0
0.8
0.6
0.4
0.2
0.0
0
5
10
15
20
25
30

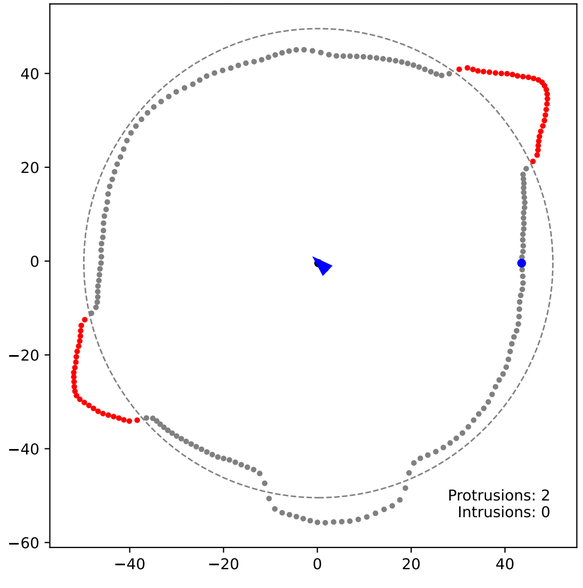

Shape evolution (t = 221.00)
Riemann Velocity: 0.1700
Max curvature: 0.0237
180
160
140
120
100
440
460
480
500

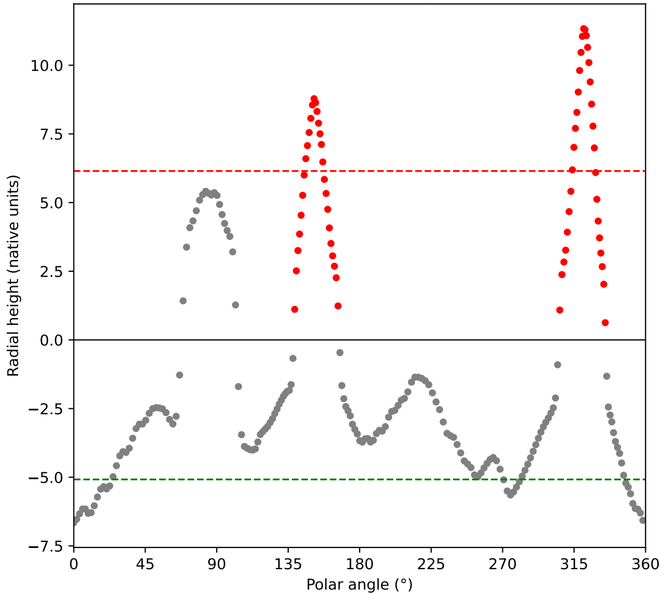

Topographical representation
Protrusions: 2
Intrusions: 0
40
20
0
−20
−40
−60
−40
−20
0
20
40

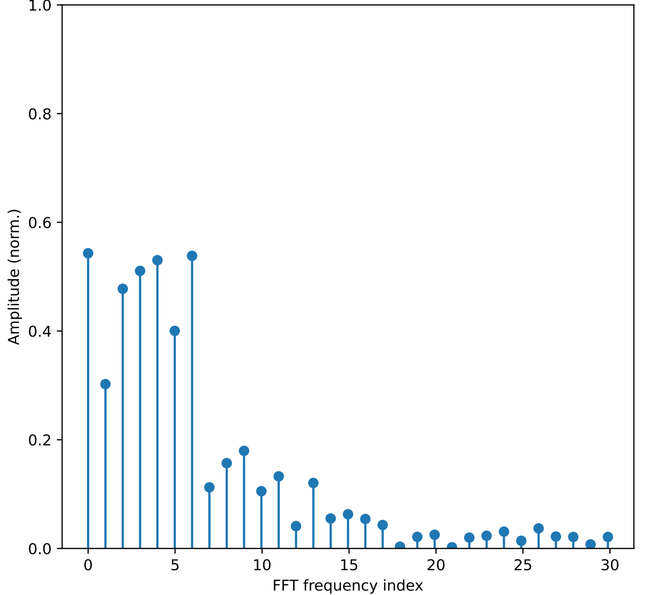

Topographical height
Radial height (native units)
Polar angle (°)
10.0
7.5
5.0
2.5
0.0
−2.5
−5.0
0
45
90
135
180
225
270
315
360

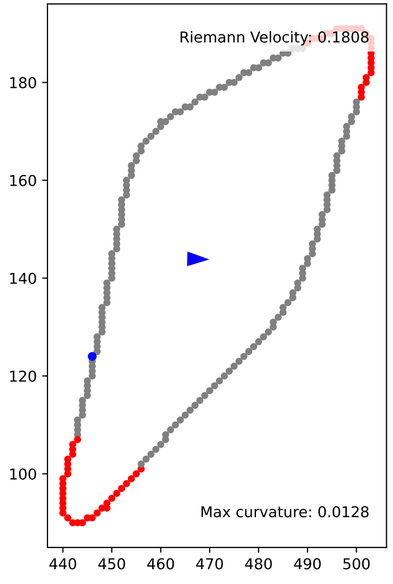

FFT spectrum (scatter)
Amplitude (norm.)
FFT frequency index
1.0
0.8
0.6
0.4
0.2
0.0
0
5
10
15
20
25
30

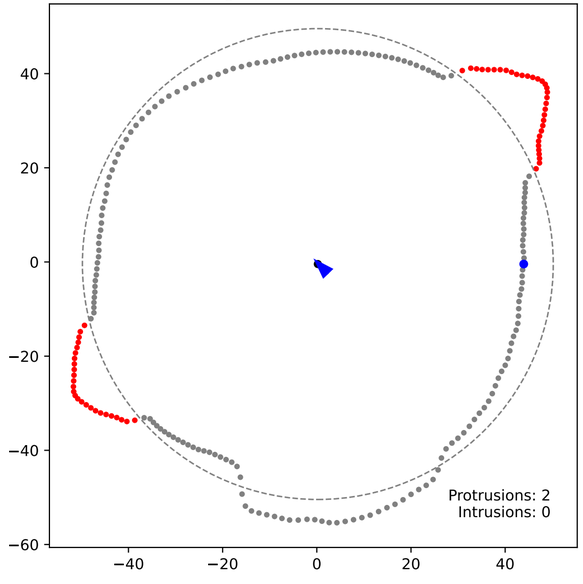

Shape evolution (t = 222.00)
Riemann Velocity: 0.1937
Max curvature: 0.0141
180
160
140
120
100
440
460
480
500

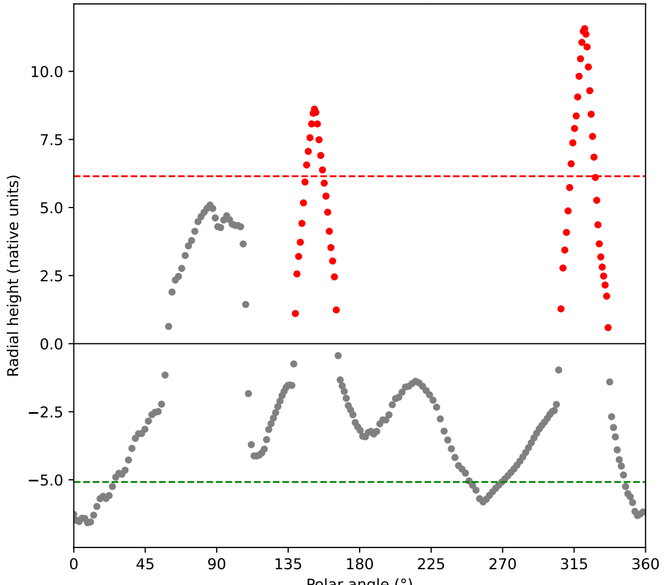

Topographical representation
Protrusions: 2
Intrusions: 0
40
20
0
−20
−40
−60
−40
−20
0
20
40

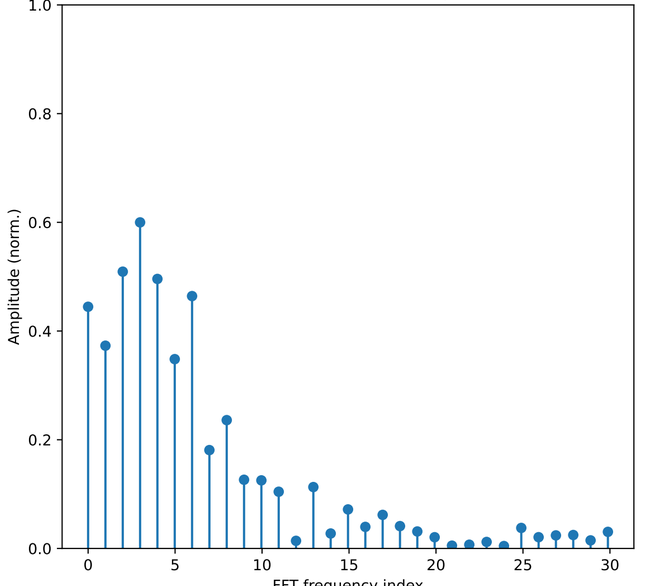

Topographical height
Radial height (native units)
Polar angle (°)
10.0
7.5
5.0
2.5
0.0
−2.5
−5.0
−7.5
0
45
90
135
180
225
270
315
360

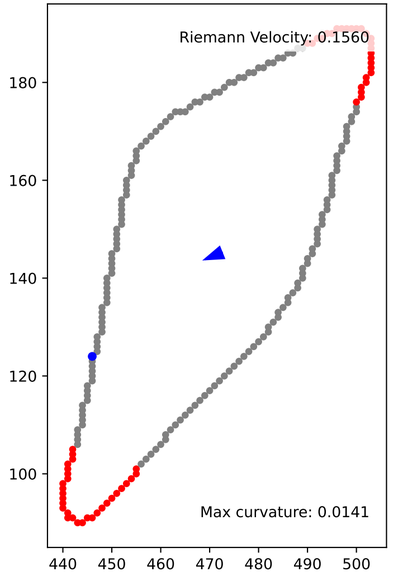

FFT spectrum (scatter)
Amplitude (norm.)
FFT frequency index
1.0
0.8
0.6
0.4
0.2
0.0
0
5
10
15
20
25
30

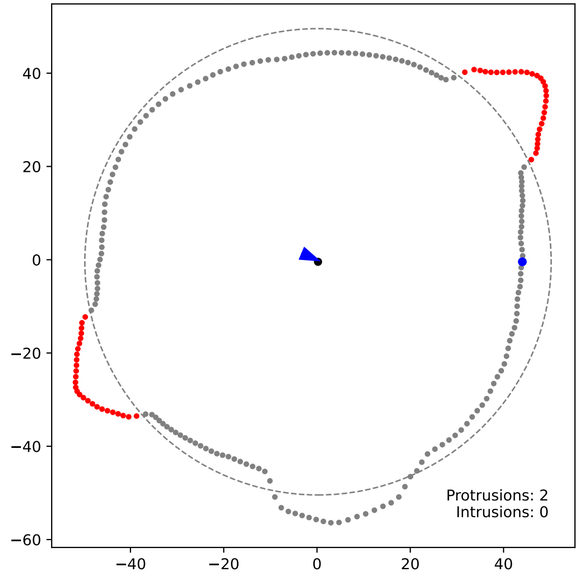

Shape evolution (t = 223.00)
Riemann Velocity: 0.1808
Max curvature: 0.0128
180
160
140
120
100
440
450
460
470
480
490
500

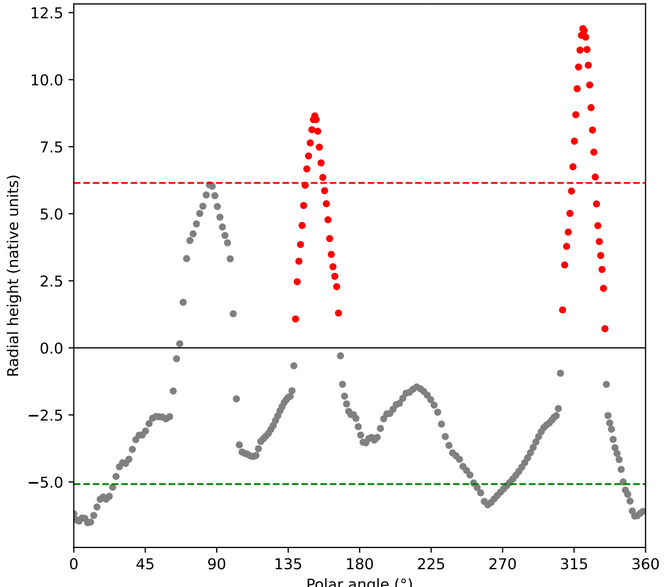

Topographical representation
Protrusions: 2
Intrusions: 0
40
20
0
−20
−40
−60
−40
−20
0
20
40

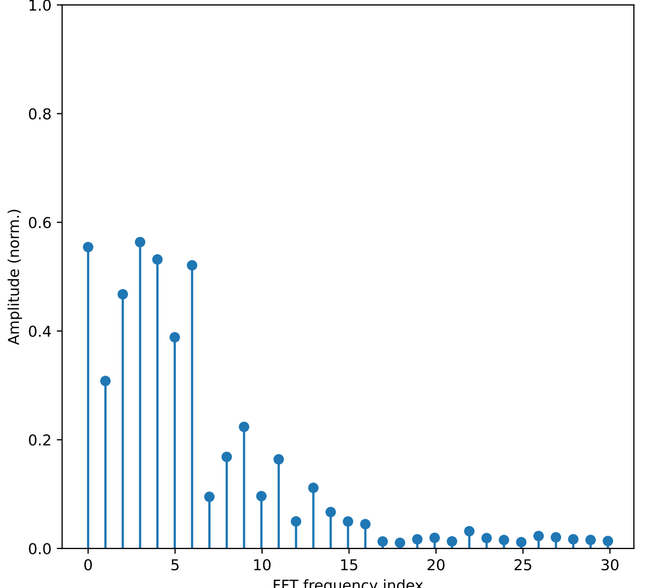

Topographical height
Radial height (native units)
Polar angle (°)
10.0
7.5
5.0
2.5
0.0
−2.5
−5.0
0
45
90
135
180
225
270
315
360

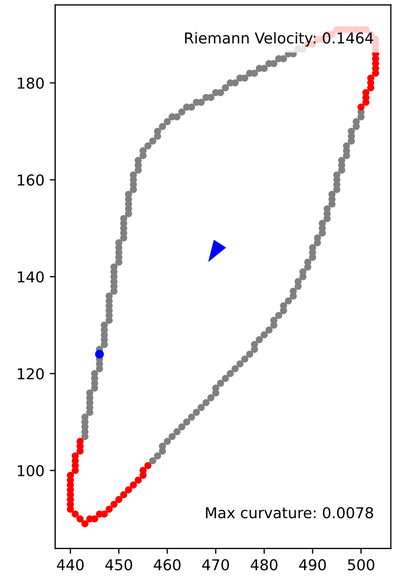

FFT spectrum (scatter)
Amplitude (norm.)
FFT frequency index
1.0
0.8
0.6
0.4
0.2
0.0
0
5
10
15
20
25
30

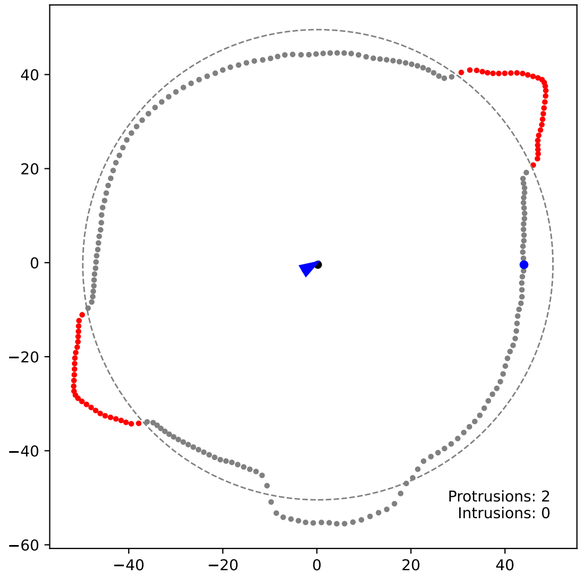

Shape evolution (t = 224.00)
Riemann Velocity: 0.1560
Max curvature: 0.0141
180
160
140
120
100
440
450
460
470
480
490
500

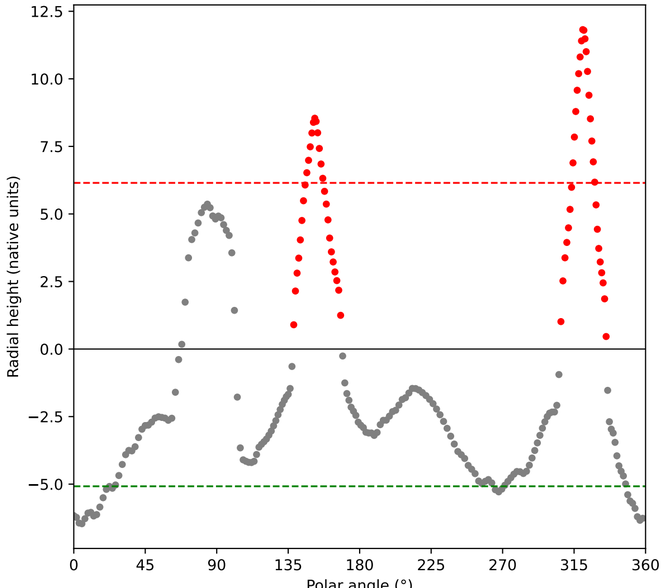

Topographical representation
Protrusions: 2
Intrusions: 0
40
20
0
−20
−40
−60
−40
−20
0
20
40

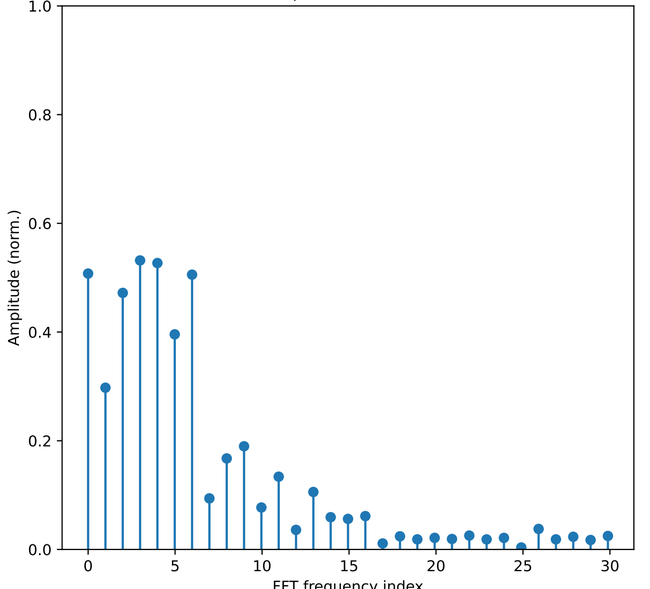

Topographical height
Radial height (native units)
Polar angle (°)
12.5
10.0
7.5
5.0
2.5
0.0
−2.5
−5.0
0
45
90
135
180
225
270
315
360

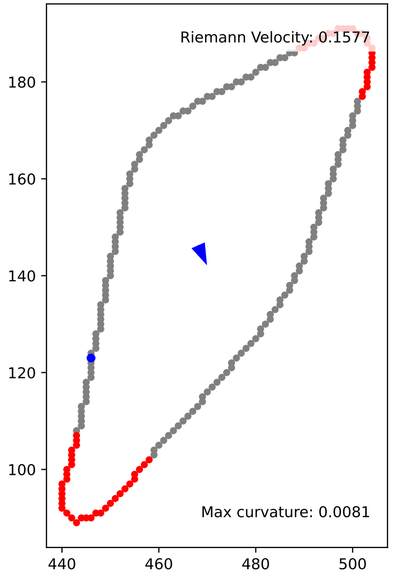

FFT spectrum (scatter)
Amplitude (norm.)
FFT frequency index
1.0
0.8
0.6
0.4
0.2
0.0
0
5
10
15
20
25
30

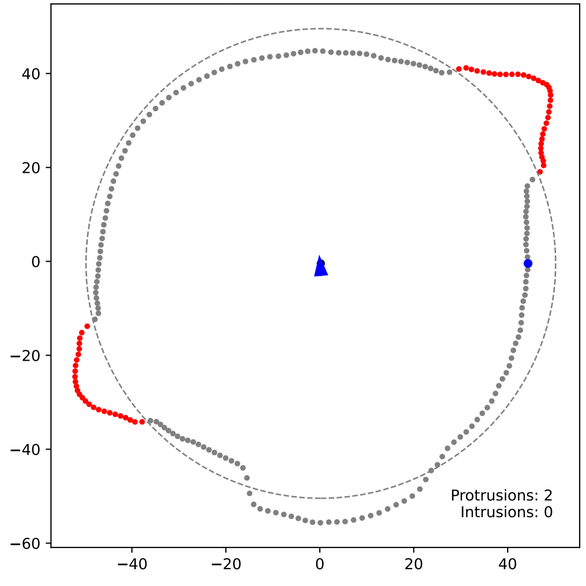

Shape evolution (t = 225.00)
Riemann Velocity: 0.1464
Max curvature: 0.0078
180
160
140
120
100
440
450
460
470
480
490
500

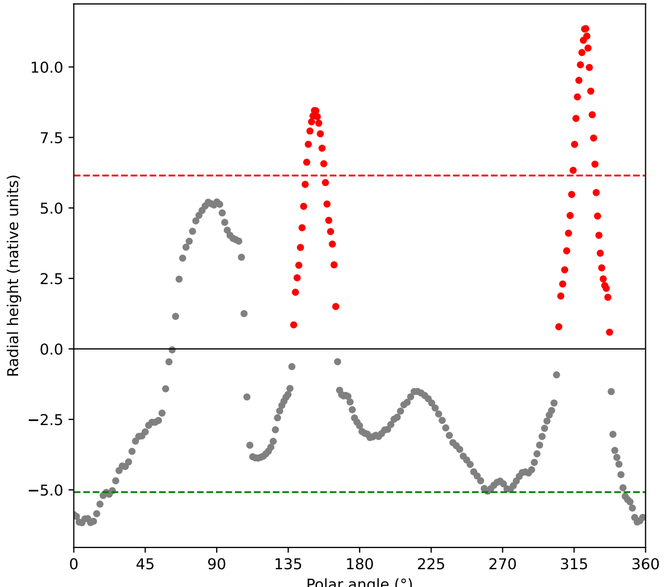

Topographical representation
Protrusions: 2
Intrusions: 0
40
20
0
−20
−40
−60
−40
−20
0
20
40

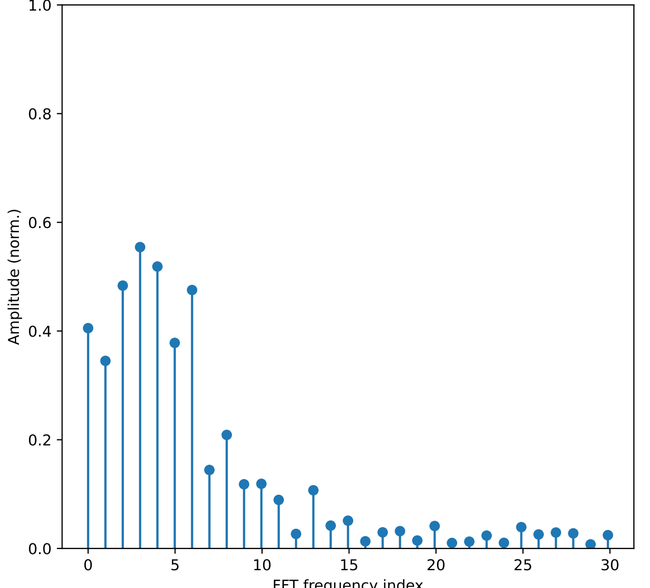

Topographical height
Radial height (native units)
Polar angle (°)
12.5
10.0
7.5
5.0
2.5
0.0
−2.5
−5.0
0
45
90
135
180
225
270
315
360

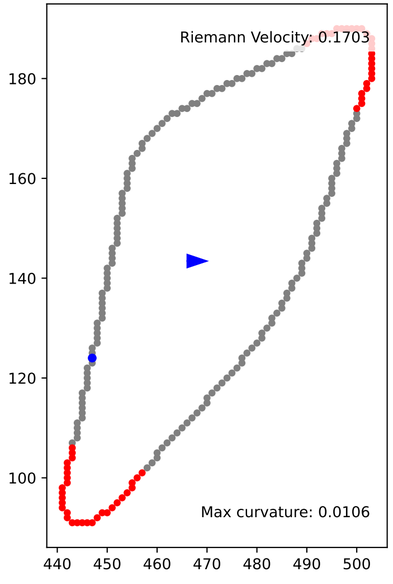

FFT spectrum (scatter)
Amplitude (norm.)
FFT frequency index
1.0
0.8
0.6
0.4
0.2
0.0
0
5
10
15
20
25
30

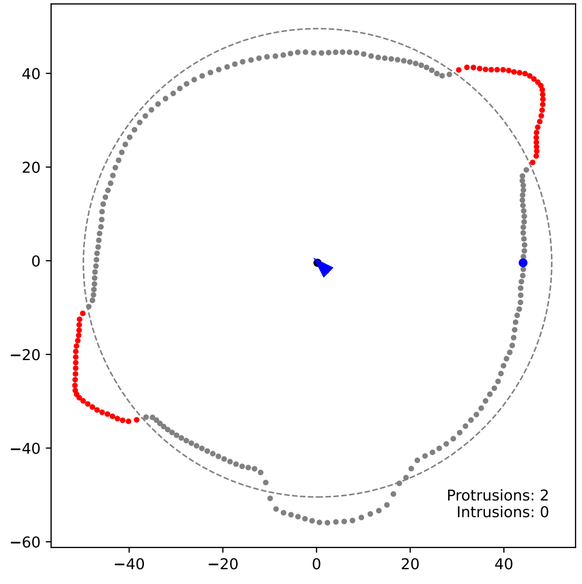

Shape evolution (t = 226.00)
Riemann Velocity: 0.1577
Max curvature: 0.0081
180
160
140
120
100
440
460
480
500

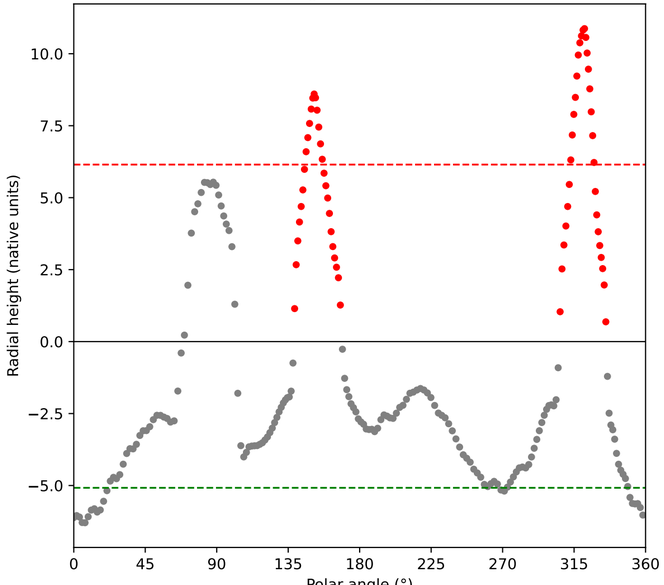

Topographical representation
Protrusions: 2
Intrusions: 0
40
20
0
−20
−40
−60
−40
−20
0
20
40

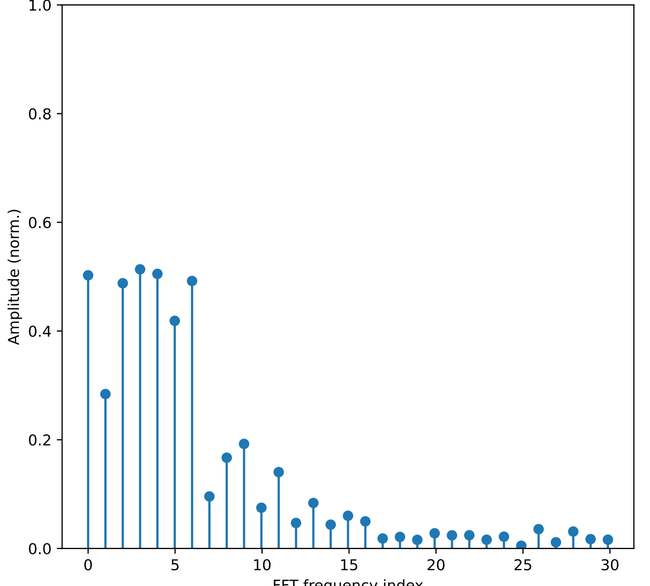

Topographical height
Radial height (native units)
Polar angle (°)
10.0
7.5
5.0
2.5
0.0
−2.5
−5.0
0
45
90
135
180
225
270
315
360

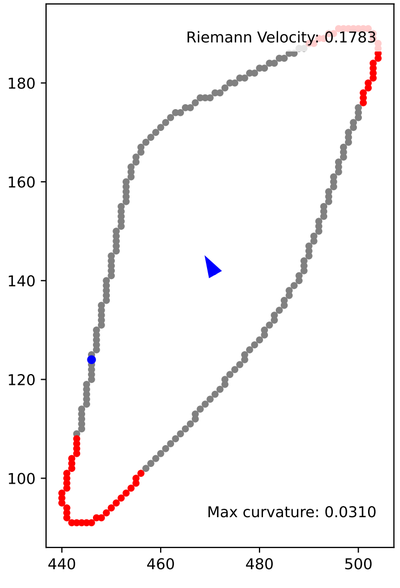

FFT spectrum (scatter)
Amplitude (norm.)
FFT frequency index
1.0
0.8
0.6
0.4
0.2
0.0
0
5
10
15
20
25
30

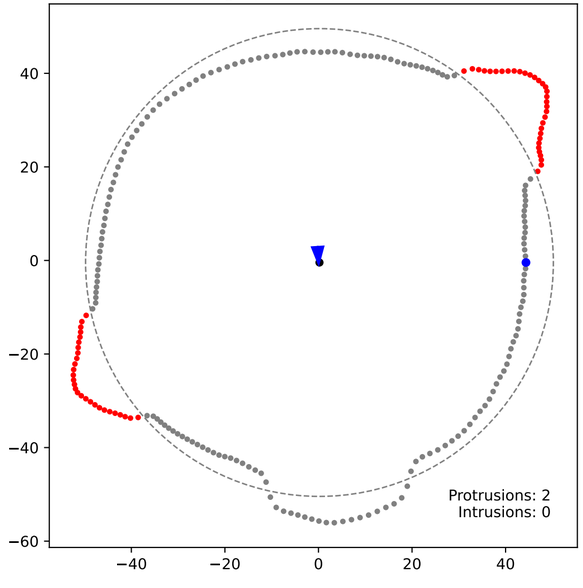

Shape evolution (t = 227.00)
Riemann Velocity: 0.1703
Max curvature: 0.0106
180
160
140
120
100
440
450
460
470
480
490
500

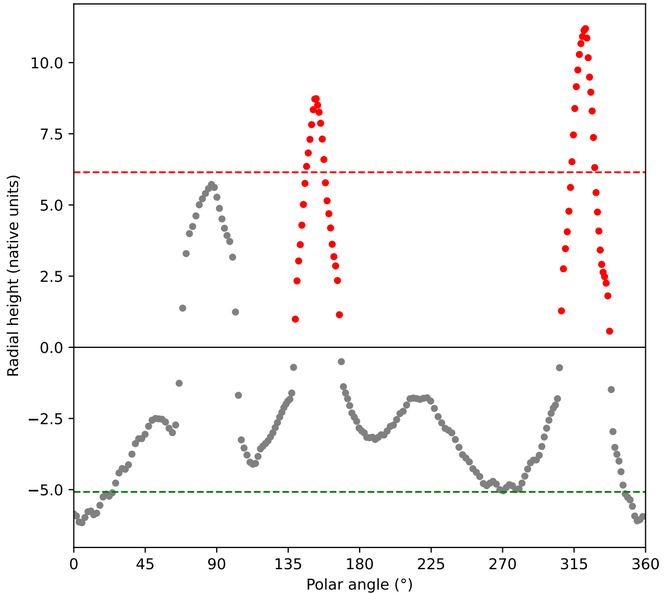

Topographical representation
Protrusions: 2
Intrusions: 0
40
20
0
−20
−40
−60
−40
−20
0
20
40

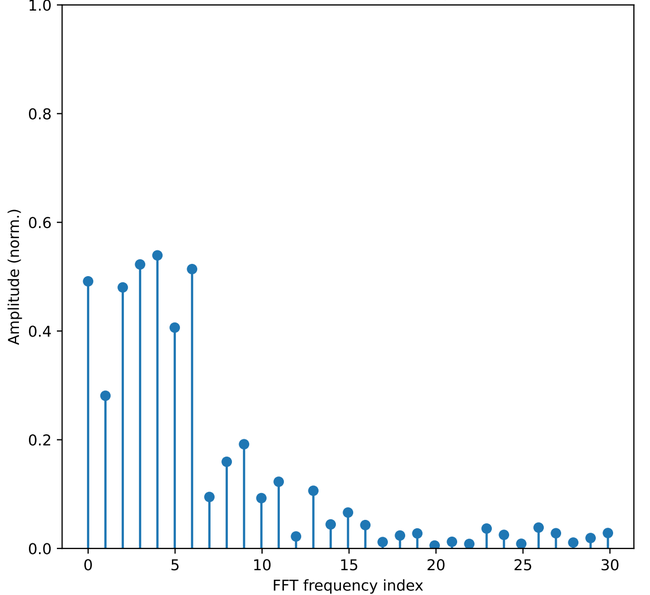

Topographical height
Radial height (native units)
Polar angle (°)
10.0
7.5
5.0
2.5
0.0
−2.5
−5.0
0
45
90
135
180
225
270
315
360

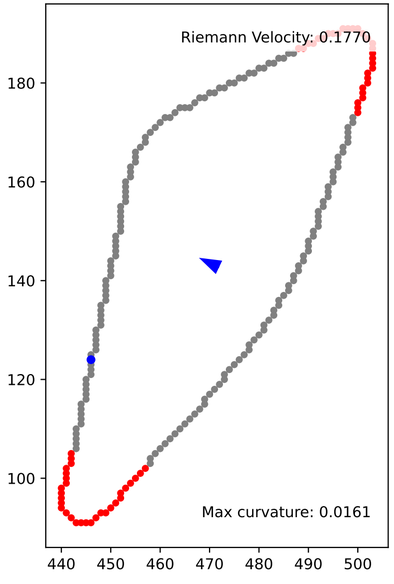

FFT spectrum (scatter)
Amplitude (norm.)
FFT frequency index
1.0
0.8
0.6
0.4
0.2
0.0
0
5
10
15
20
25
30

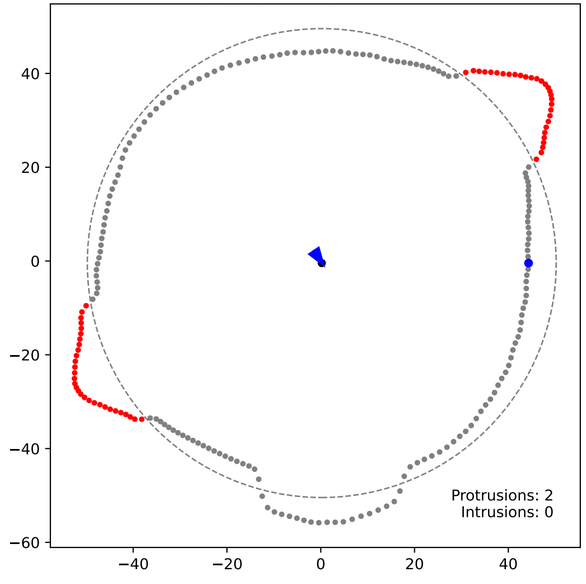

Shape evolution (t = 228.00)
Riemann Velocity: 0.1783
Max curvature: 0.0310
180
160
140
120
100
440
460
480
500

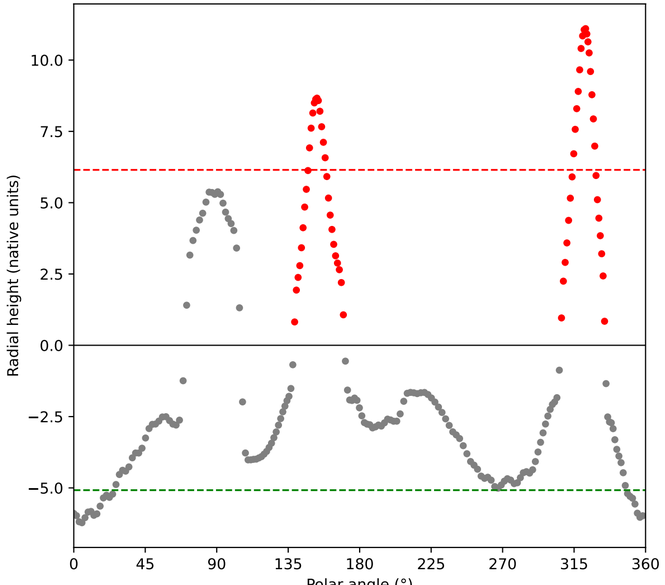

Topographical representation
Protrusions: 2
Intrusions: 0
40
20
0
−20
−40
−60
−40
−20
0
20
40

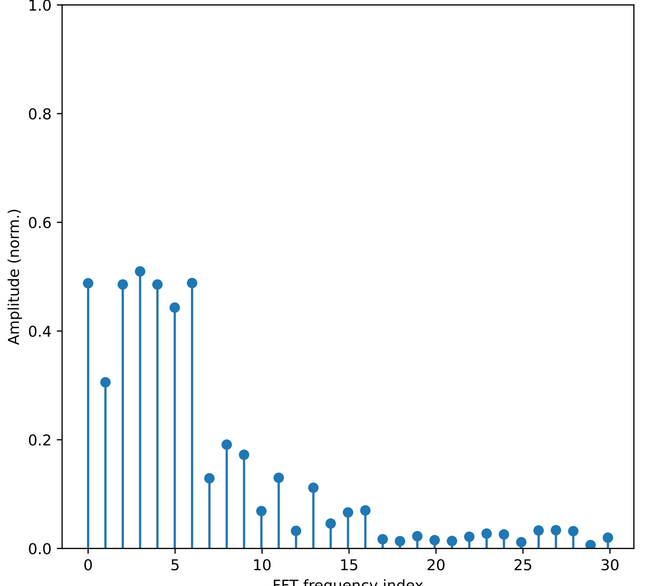

Topographical height
Radial height (native units)
Polar angle (°)
10.0
7.5
5.0
2.5
0.0
−2.5
−5.0
0
45
90
135
180
225
270
315
360

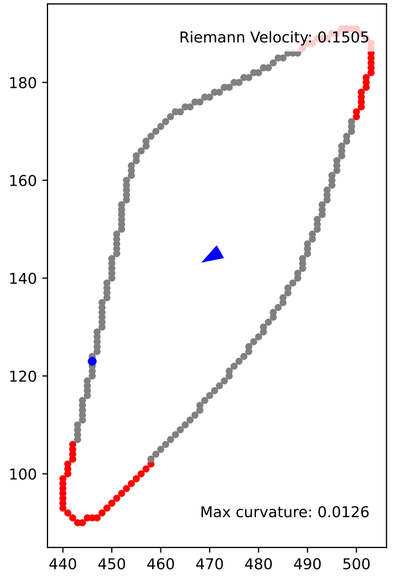

FFT spectrum (scatter)
Amplitude (norm.)
FFT frequency index
1.0
0.8
0.6
0.4
0.2
0.0
0
5
10
15
20
25
30

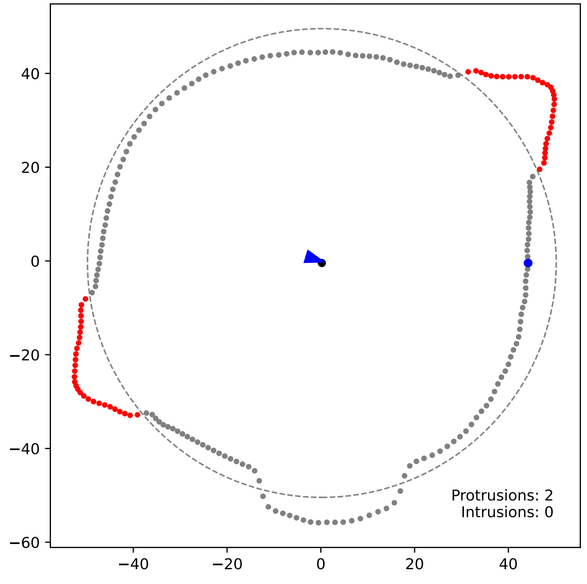

Shape evolution (t = 229.00)
Riemann Velocity: 0.1770
Max curvature: 0.0161
180
160
140
120
100
440
450
460
470
480
490
500

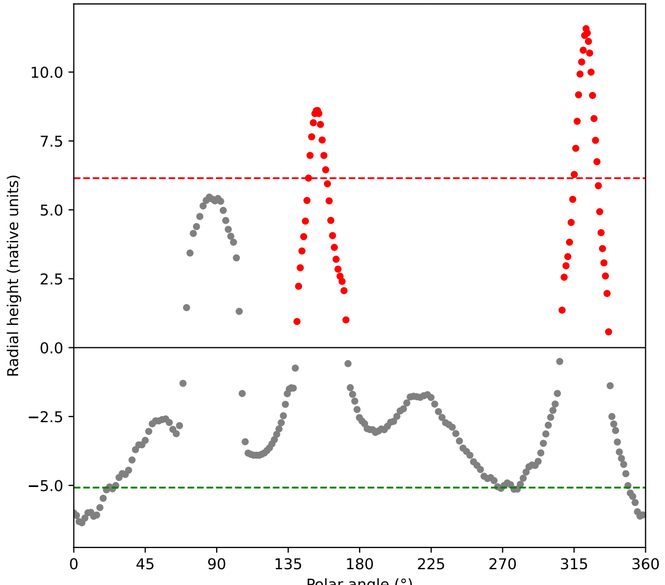

Topographical representation
Protrusions: 2
Intrusions: 0
40
20
0
−20
−40
−60
−40
−20
0
20
40

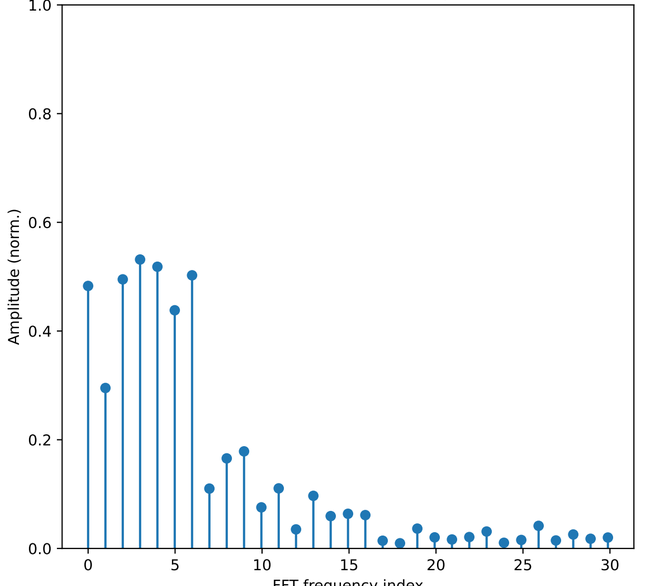

Topographical height
Radial height (native units)
Polar angle (°)
10.0
7.5
5.0
2.5
0.0
−2.5
−5.0
0
45
90
135
180
225
270
315
360

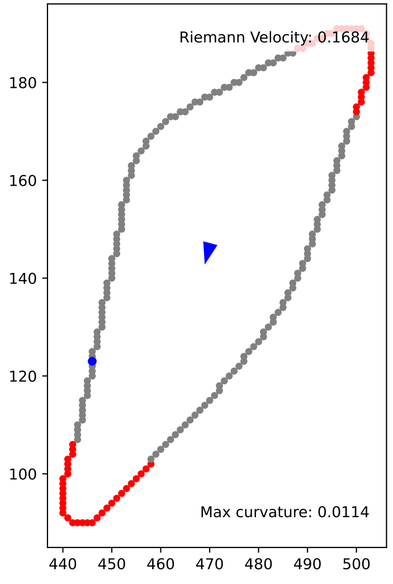

FFT spectrum (scatter)
Amplitude (norm.)
FFT frequency index
1.0
0.8
0.6
0.4
0.2
0.0
0
5
10
15
20
25
30

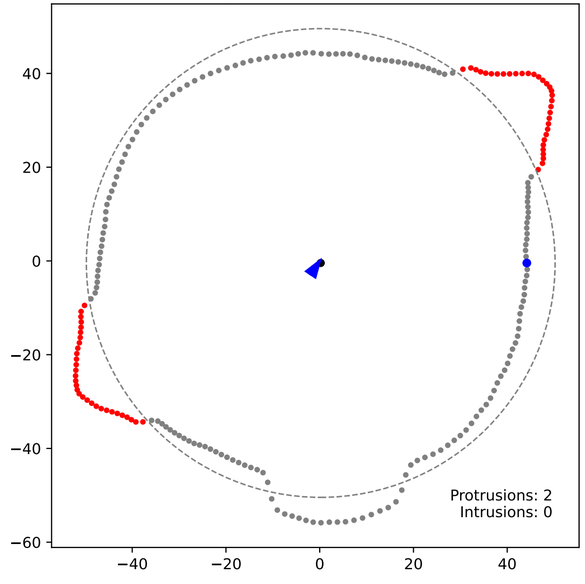

Shape evolution (t = 230.00)
Riemann Velocity: 0.1505
Max curvature: 0.0126
180
160
140
120
100
440
450
460
470
480
490
500

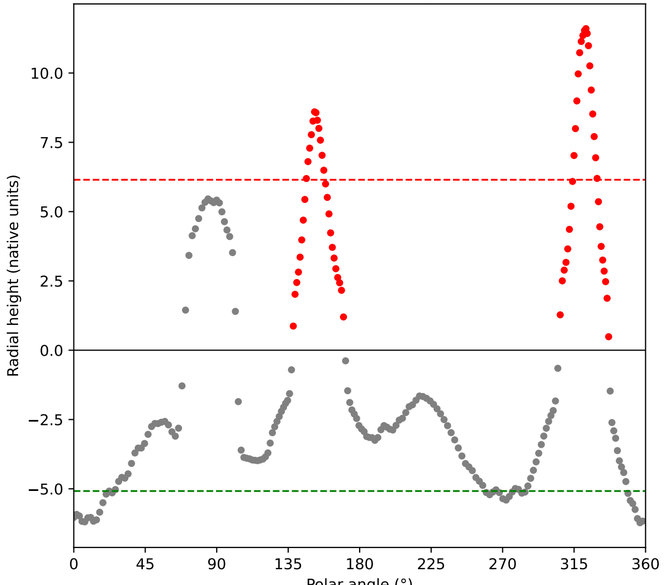

Topographical representation
Protrusions: 2
Intrusions: 0
40
20
0
−20
−40
−60
−40
−20
0
20
40

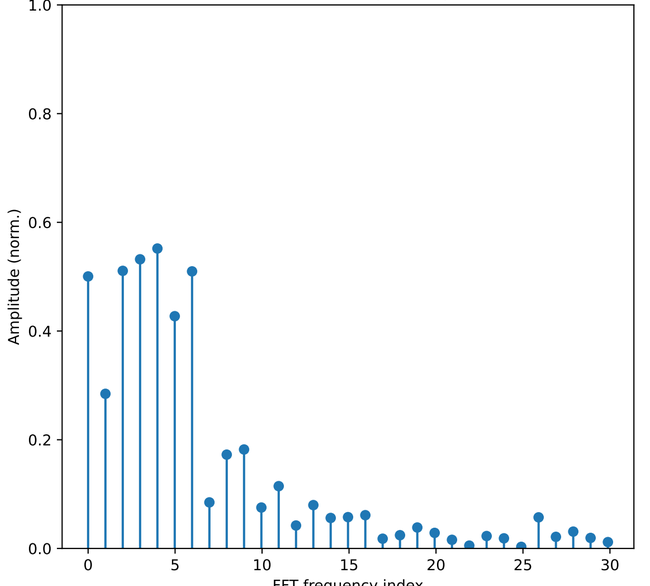

Topographical height
Radial height (native units)
Polar angle (°)
10.0
7.5
5.0
2.5
0.0
−2.5
−5.0
0
45
90
135
180
225
270
315
360

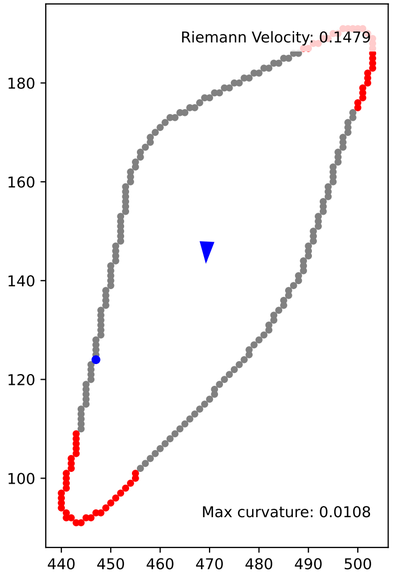

FFT spectrum (scatter)
Amplitude (norm.)
FFT frequency index
1.0
0.8
0.6
0.4
0.2
0.0
0
5
10
15
20
25
30


Shape evolution (t = 231.00)
Riemann Velocity: 0.1684
Max curvature: 0.0114
180
160
140
120
100
440
450
460
470
480
490
500


Topographical representation
Protrusions: 2
Intrusions: 0
40
20
0
−20
−40
−60
−40
−20
0
20
40


Topographical height
Radial height (native units)
Polar angle (°)
10.0
7.5
5.0
2.5
0.0
−2.5
−5.0
0
45
90
135
180
225
270
315
360


FFT spectrum (scatter)
Amplitude (norm.)
FFT frequency index
1.0
0.8
0.6
0.4
0.2
0.0
0
5
10
15
20
25
30


Shape evolution (t = 232.00)
Riemann Velocity: 0.1479
Max curvature: 0.0108
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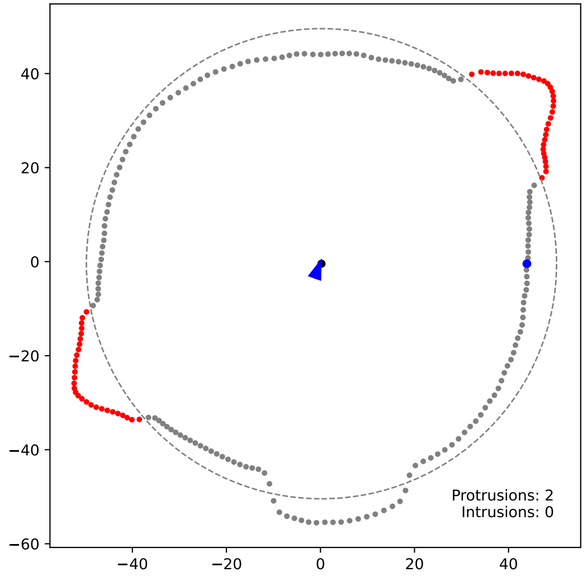
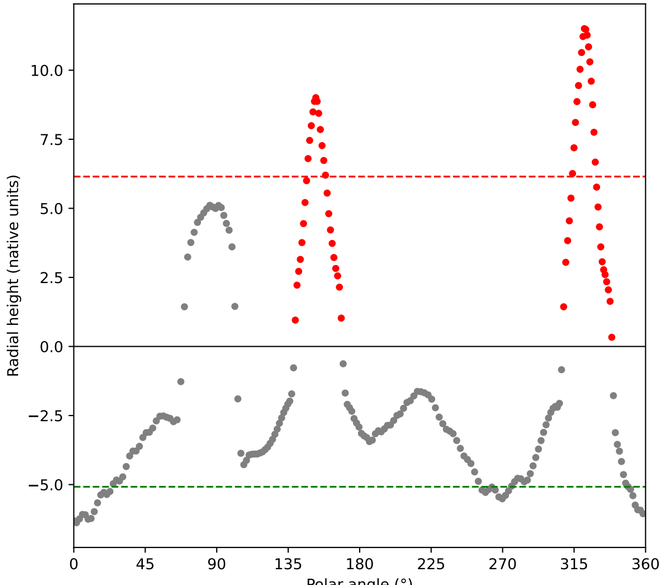
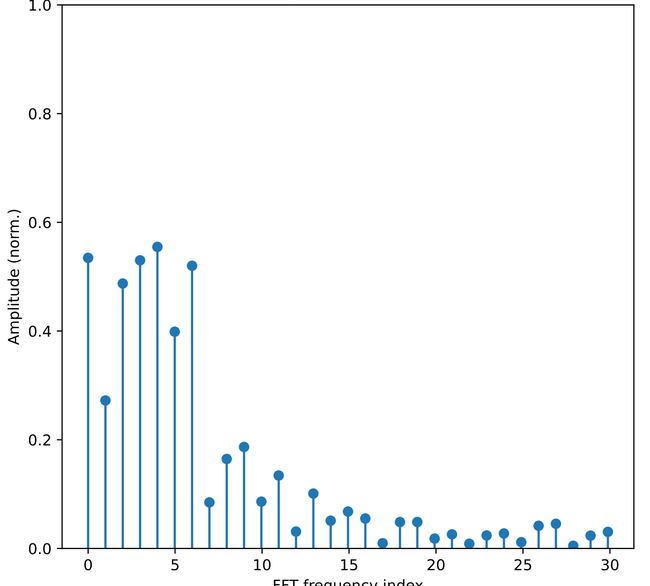
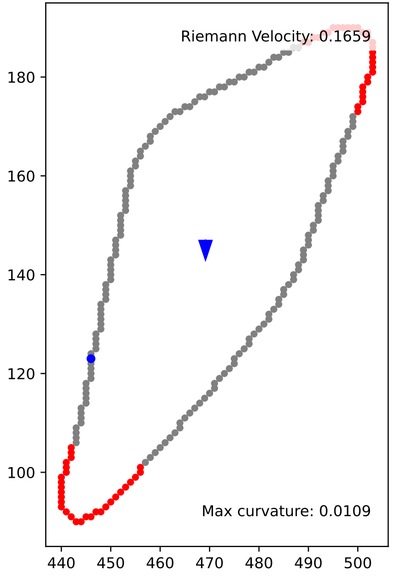
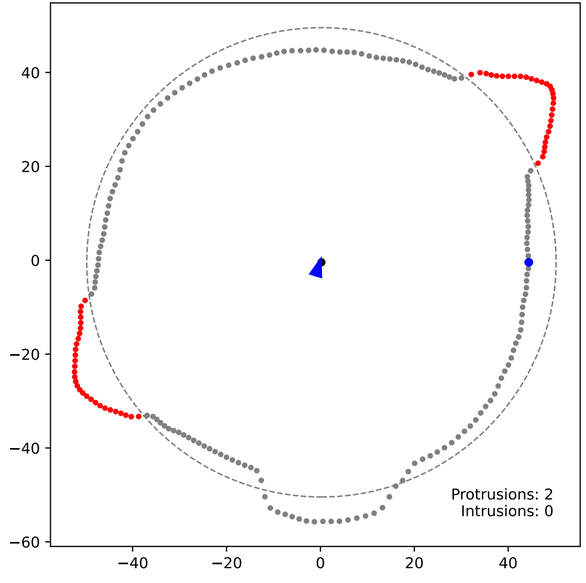
160
140
120
100
440
450
460
470
480
490
500

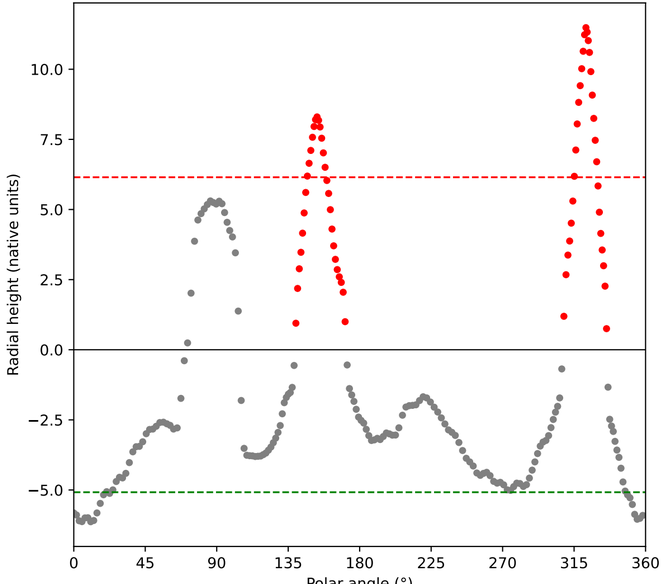

Topographical representation
Protrusions: 2
Intrusions: 0
40
20
0
−20
−40
−60
−40
−20
0
20
40

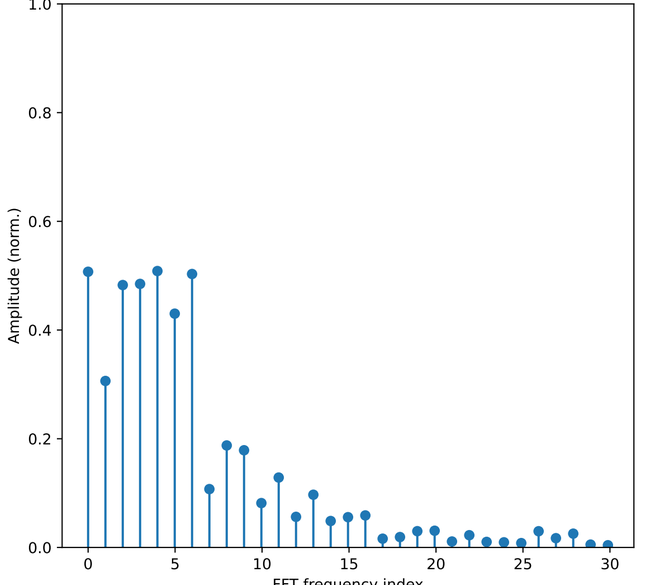

Topographical height
Radial height (native units)
Polar angle (°)
10.0
7.5
5.0
2.5
0.0
−2.5
−5.0
0
45
90
135
180
225
270
315
360

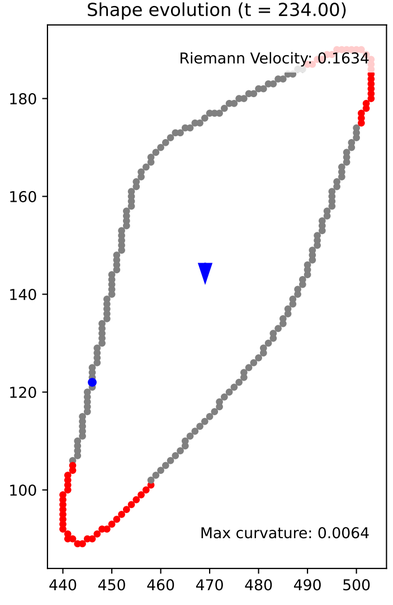

FFT spectrum (scatter)
Amplitude (norm.)
FFT frequency index
1.0
0.8
0.6
0.4
0.2
0.0
0
5
10
15
20
25
30


Shape evolution (t = 233.00)
Riemann Velocity: 0.1659
Max curvature: 0.0109
180
160
140
120
100
440
450
460
470
480
490
500


Topographical representation
Protrusions: 2
Intrusions: 0
40
20
0
−20
−40
−60
−40
−20
0
20
40


Topographical height
Radial height (native units)
Polar angle (°)
10.0
7.5
5.0
2.5
0.0
−2.5
−5.0
0
45
90
135
180
225
270
315
360


FFT spectrum (scatter)
Amplitude (norm.)
FFT frequency index
1.0
0.8
0.6
0.4
0.2
0.0
0
5
10
15
20
25
30


Shape evolution (t = 234.00)
Riemann Velocity: 0.1634
Max curvature: 0.0064
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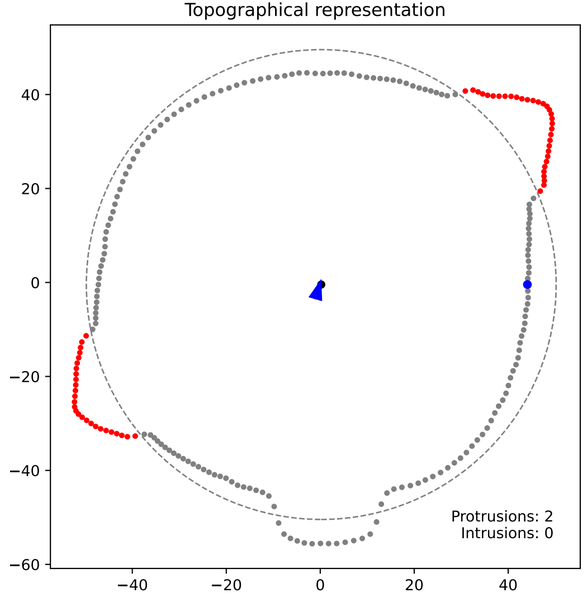
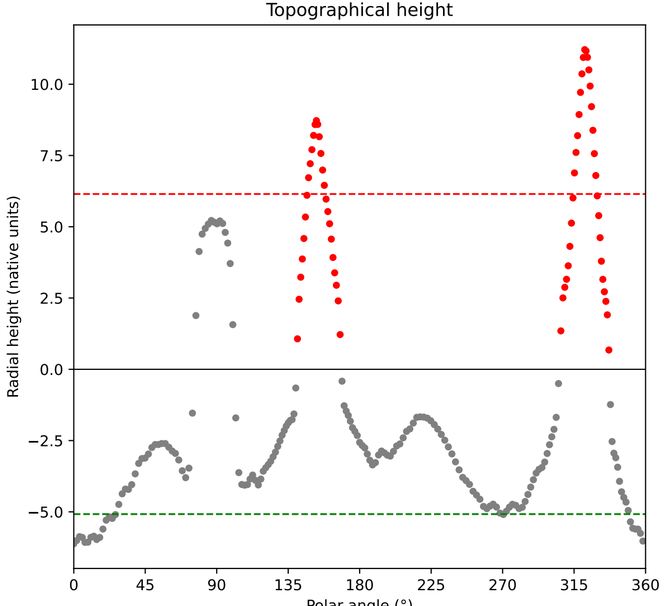
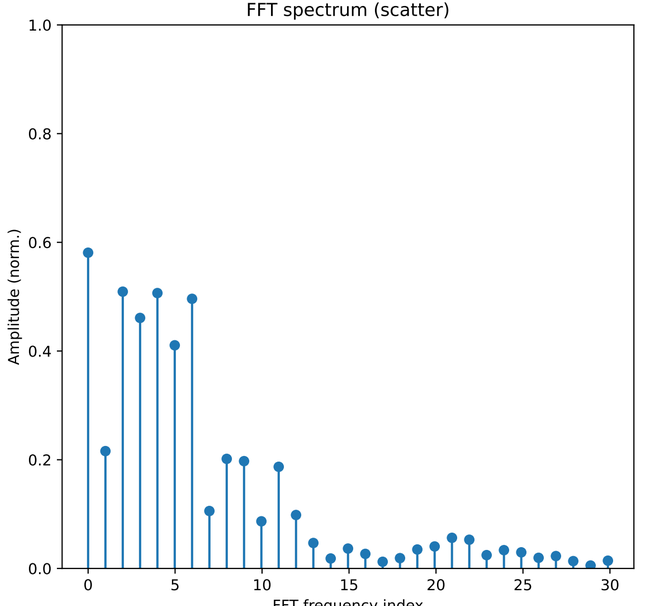
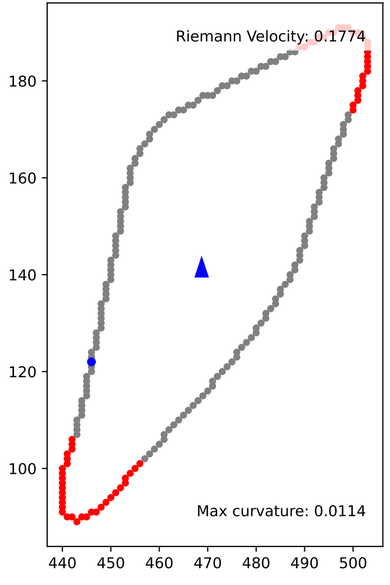
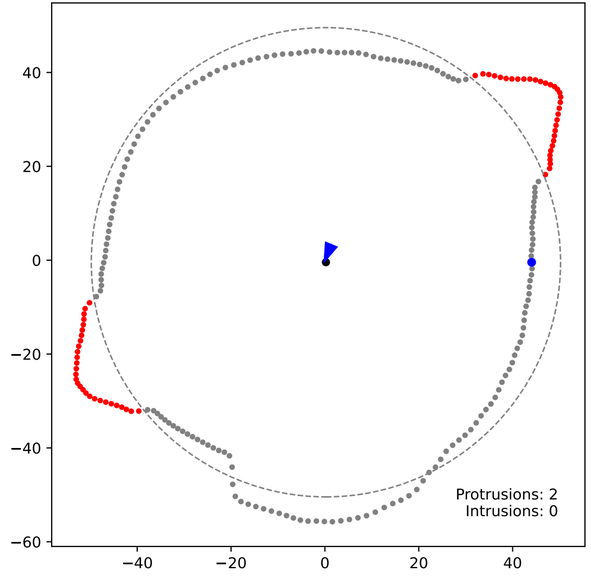
160
140
120
100
440
450
460
470
480
490
500

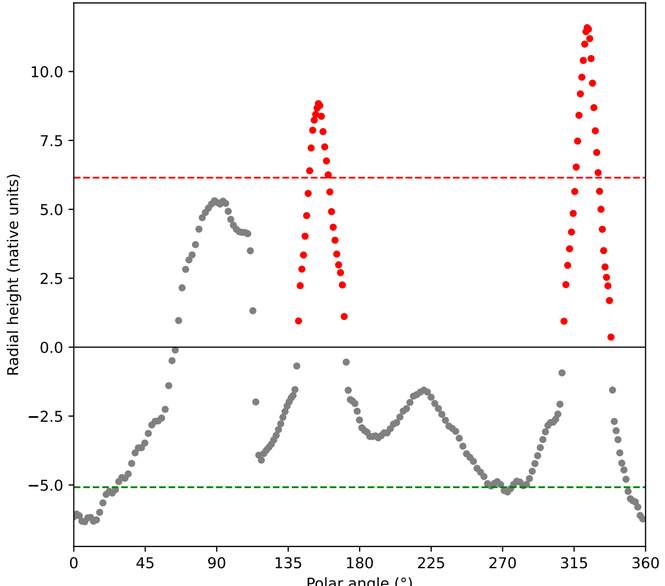

Topographical representation
Protrusions: 2
Intrusions: 0
40
20
0
−20
−40
−60
−40
−20
0
20
40

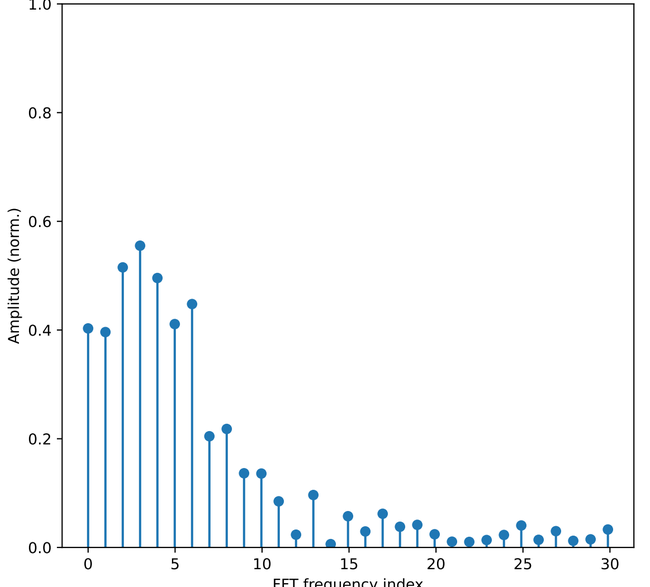

Topographical height
Radial height (native units)
Polar angle (°)
10.0
7.5
5.0
2.5
0.0
−2.5
−5.0
0
45
90
135
180
225
270
315
360

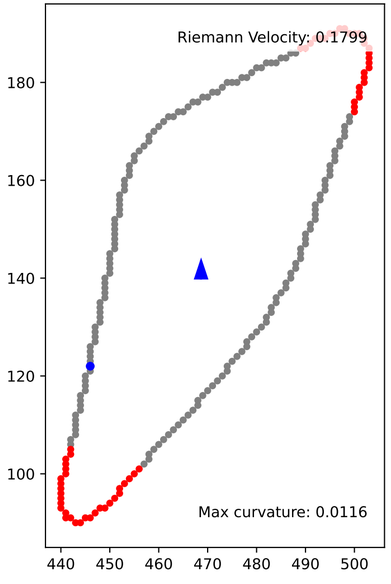

FFT spectrum (scatter)
Amplitude (norm.)
FFT frequency index
1.0
0.8
0.6
0.4
0.2
0.0
0
5
10
15
20
25
30

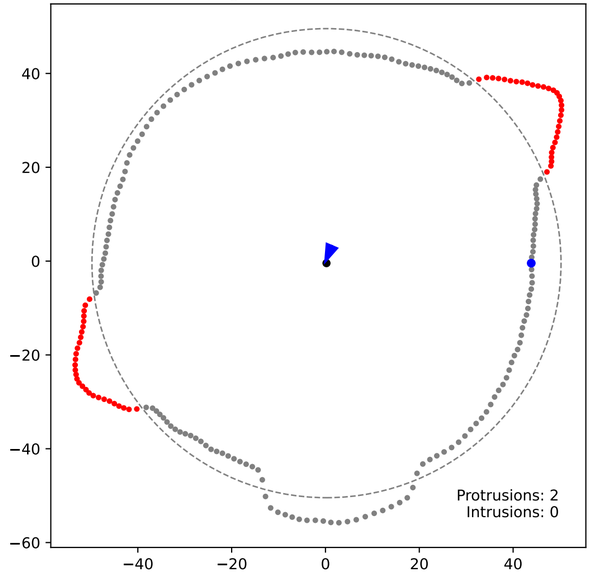

Shape evolution (t = 235.00)
Riemann Velocity: 0.1774
Max curvature: 0.0114
180
160
140
120
100
440
450
460
470
480
490
500

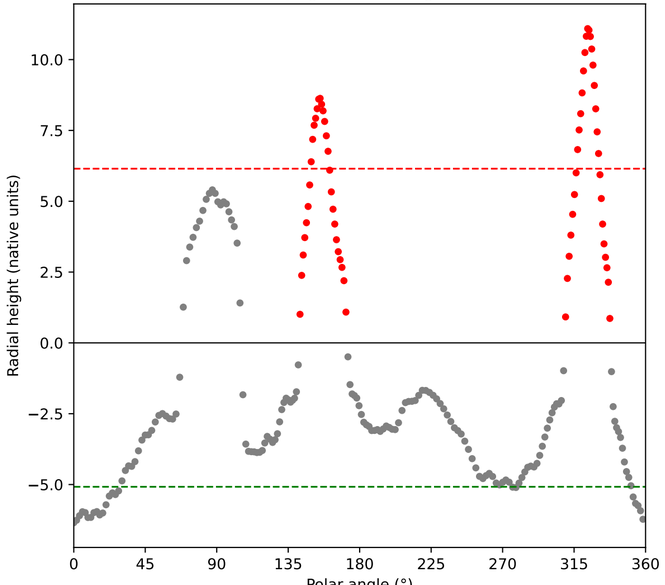

Topographical representation
Protrusions: 2
Intrusions: 0
40
20
0
−20
−40
−60
−40
−20
0
20
40

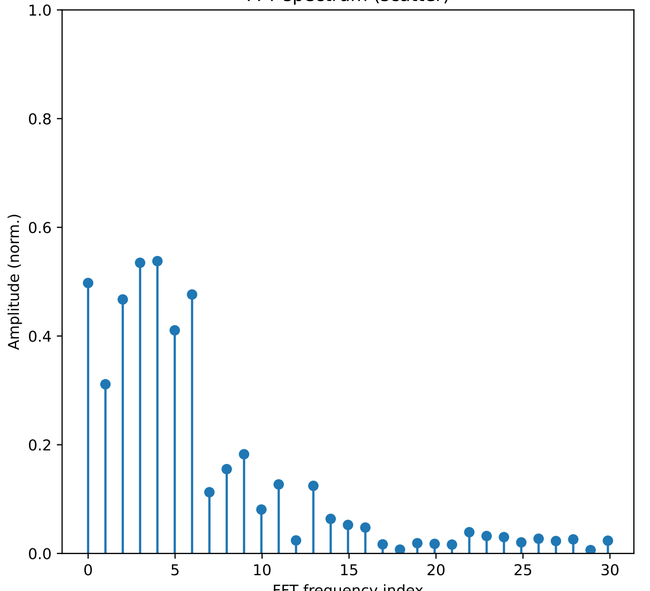

Topographical height
Radial height (native units)
Polar angle (°)
10.0
7.5
5.0
2.5
0.0
−2.5
−5.0
0
45
90
135
180
225
270
315
360

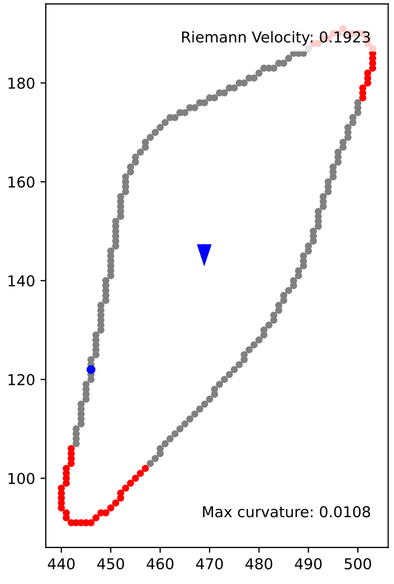

FFT spectrum (scatter)
Amplitude (norm.)
FFT frequency index
1.0
0.8
0.6
0.4
0.2
0.0
0
5
10
15
20
25
30

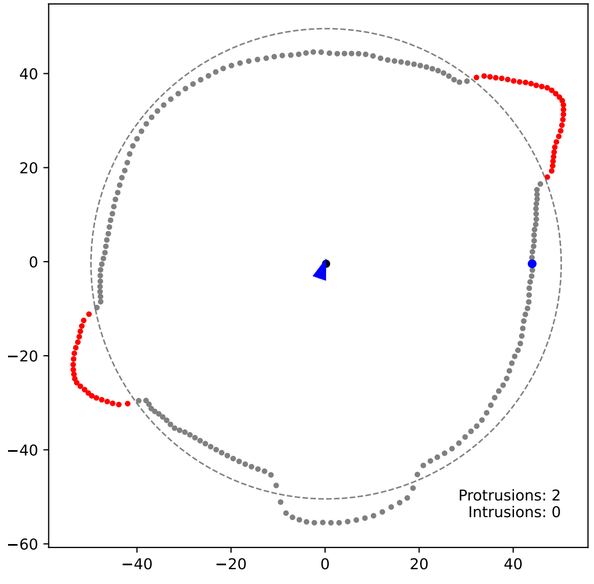

Shape evolution (t = 236.00)
Riemann Velocity: 0.1799
Max curvature: 0.0116
180
160
140
120
100
440
450
460
470
480
490
500

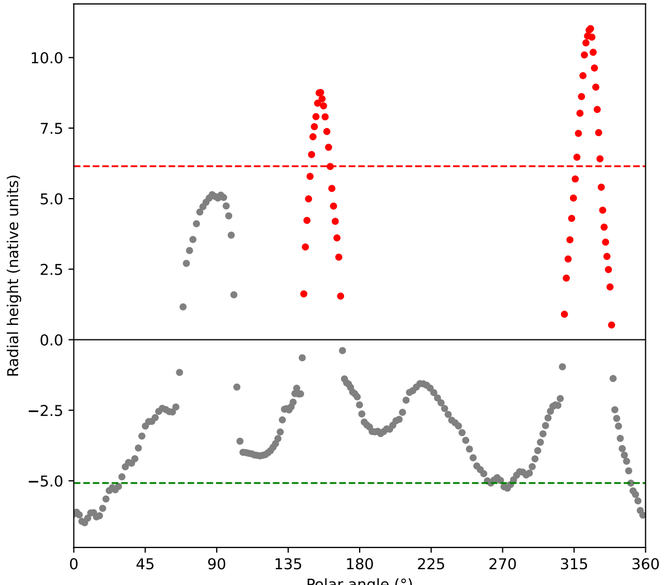

Topographical representation
Protrusions: 2
Intrusions: 0
40
20
0
−20
−40
−60
−40
−20
0
20
40

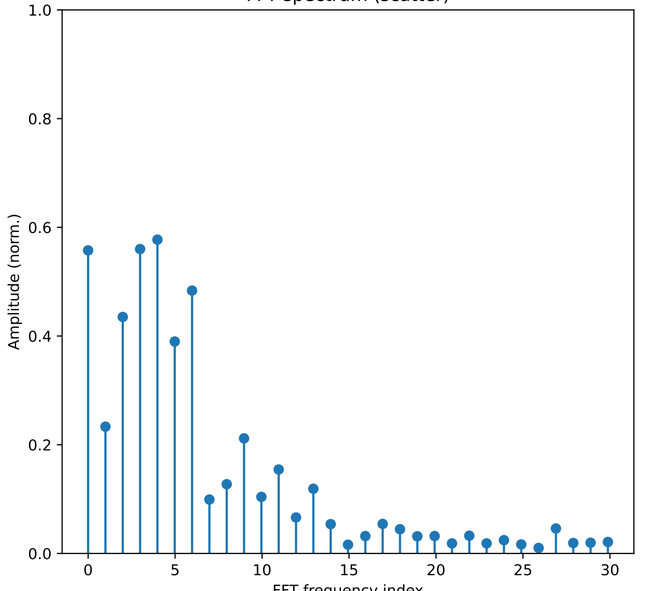

Topographical height
Radial height (native units)
Polar angle (°)
10.0
7.5
5.0
2.5
0.0
−2.5
−5.0
0
45
90
135
180
225
270
315
360

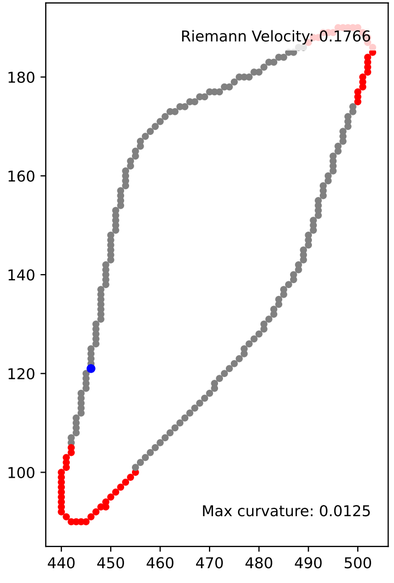

FFT spectrum (scatter)
Amplitude (norm.)
FFT frequency index
1.0
0.8
0.6
0.4
0.2
0.0
0
5
10
15
20
25
30

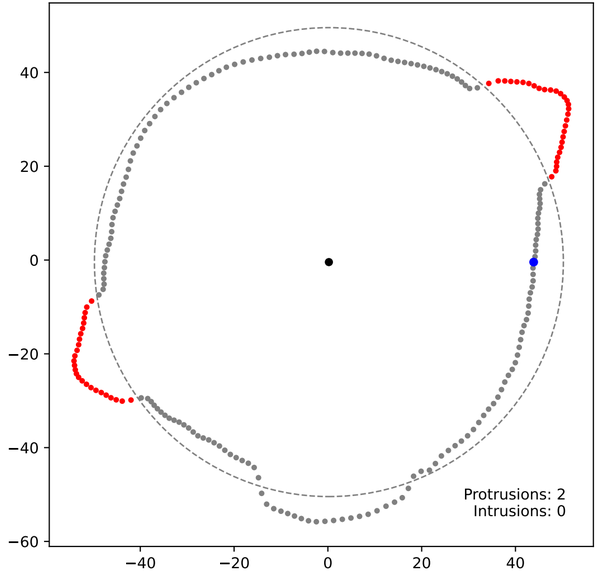

Shape evolution (t = 237.00)
Riemann Velocity: 0.1923
Max curvature: 0.0108
180
160
140
120
100
440
450
460
470
480
490
500

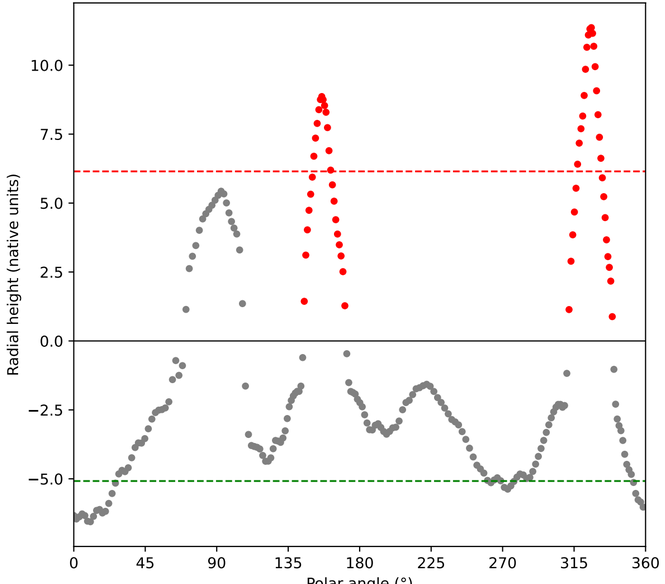

Topographical representation
Protrusions: 2
Intrusions: 0
40
20
0
−20
−40
−60
−40
−20
0
20
40

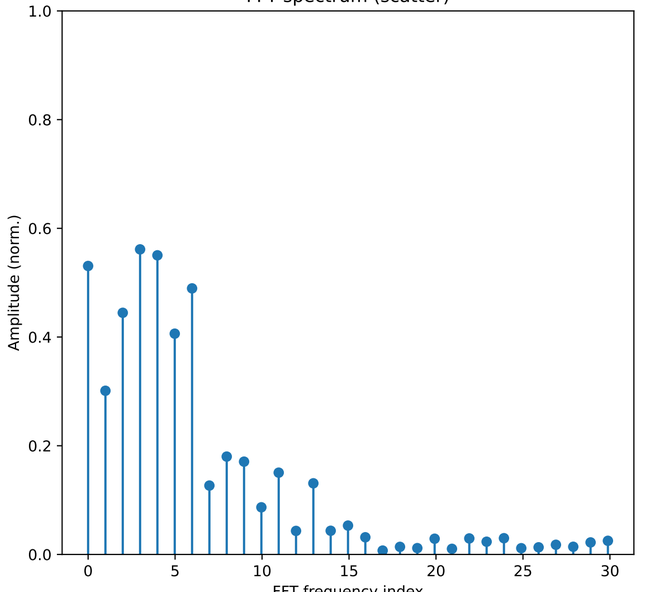

Topographical height
Radial height (native units)
Polar angle (°)
10.0
7.5
5.0
2.5
0.0
−2.5
−5.0
0
45
90
135
180
225
270
315
360

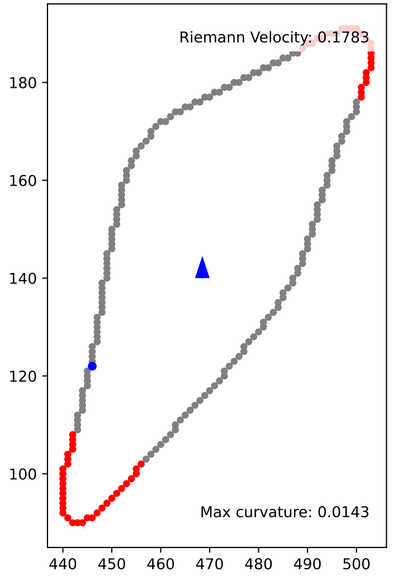

FFT spectrum (scatter)
Amplitude (norm.)
FFT frequency index
1.0
0.8
0.6
0.4
0.2
0.0
0
5
10
15
20
25
30

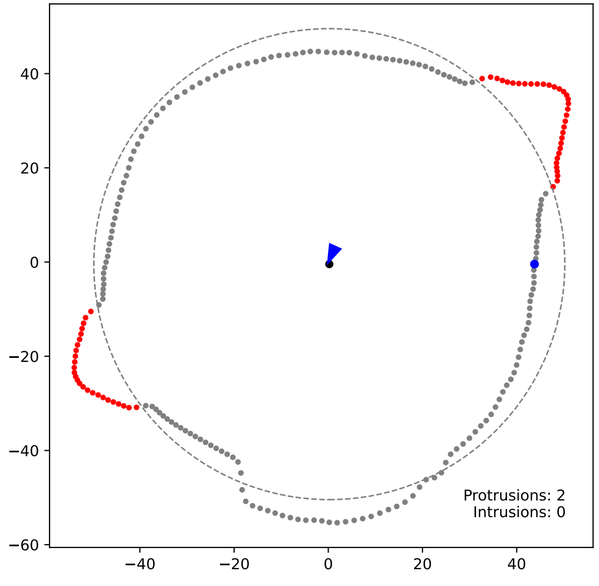

Shape evolution (t = 238.00)
Riemann Velocity: 0.1766
Max curvature: 0.0125
180
160
140
120
100
440
450
460
470
480
490
500

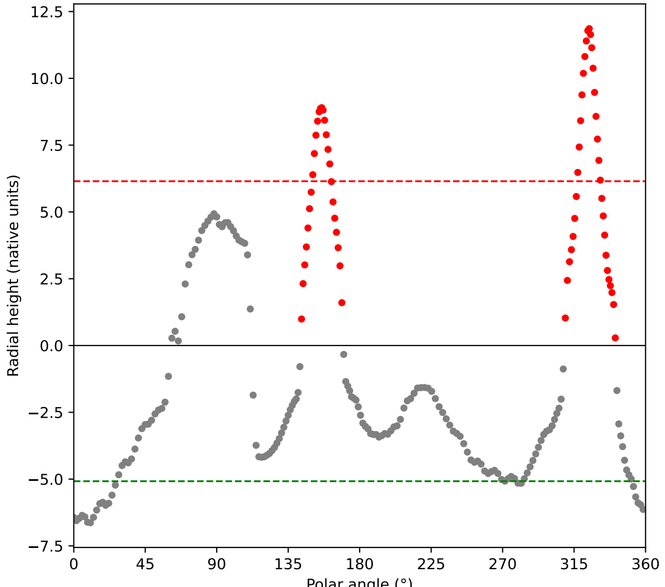

Topographical representation
Protrusions: 2
Intrusions: 0
40
20
0
−20
−40
−60
−40
−20
0
20
40

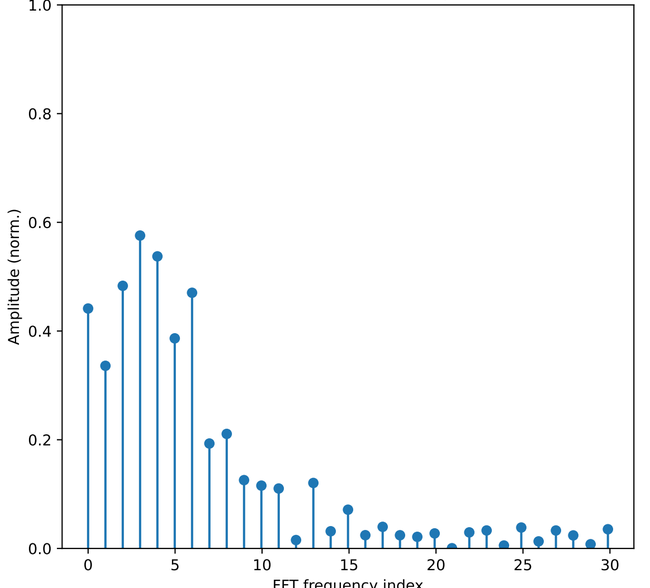

Topographical height
Radial height (native units)
Polar angle (°)
10.0
7.5
5.0
2.5
0.0
−2.5
−5.0
0
45
90
135
180
225
270
315
360

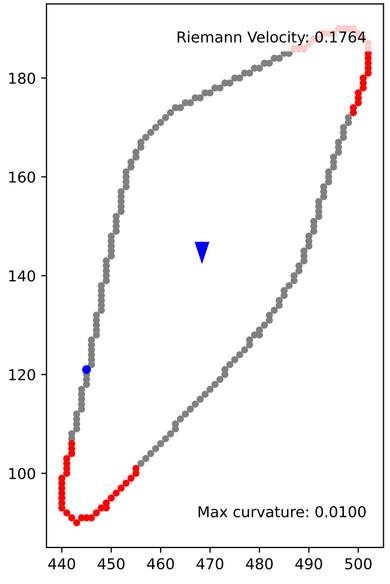

FFT spectrum (scatter)
Amplitude (norm.)
FFT frequency index
1.0
0.8
0.6
0.4
0.2
0.0
0
5
10
15
20
25
30

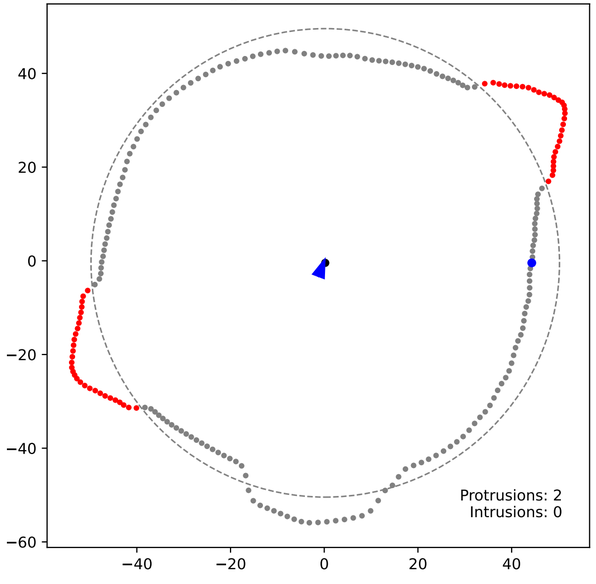

Shape evolution (t = 239.00)
Riemann Velocity: 0.1783
Max curvature: 0.0143
180
160
140
120
100
440
450
460
470
480
490
500

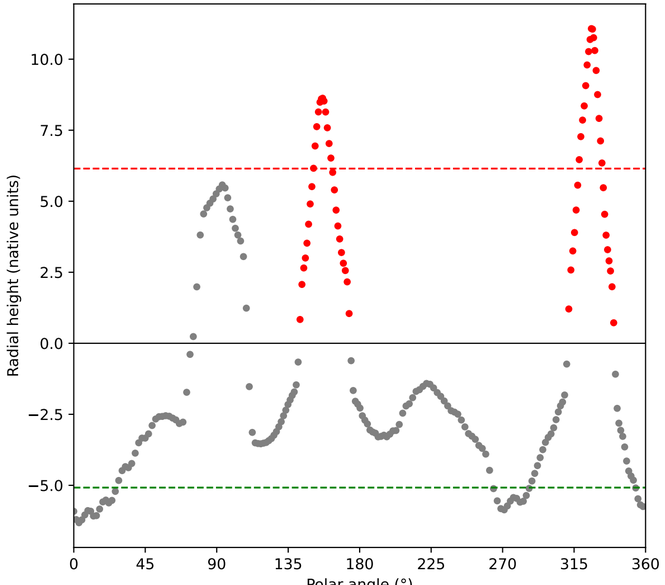

Topographical representation
Protrusions: 2
Intrusions: 0
40
20
0
−20
−40
−60
−40
−20
0
20
40

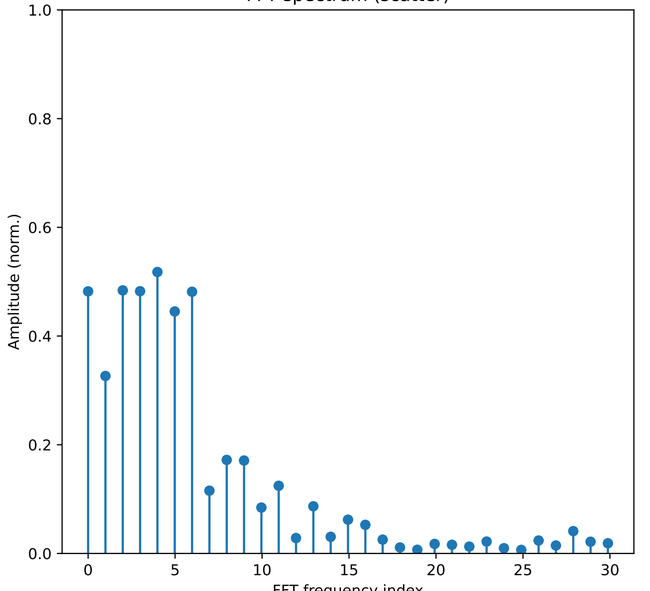

Topographical height
Radial height (native units)
Polar angle (°)
12.5
10.0
7.5
5.0
2.5
0.0
−2.5
−5.0
−7.5
0
45
90
135
180
225
270
315
360

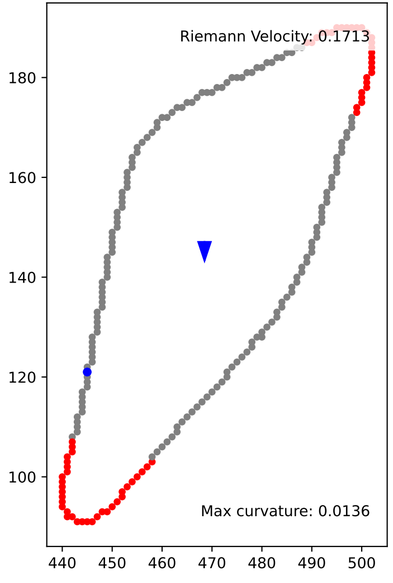

FFT spectrum (scatter)
Amplitude (norm.)
FFT frequency index
1.0
0.8
0.6
0.4
0.2
0.0
0
5
10
15
20
25
30

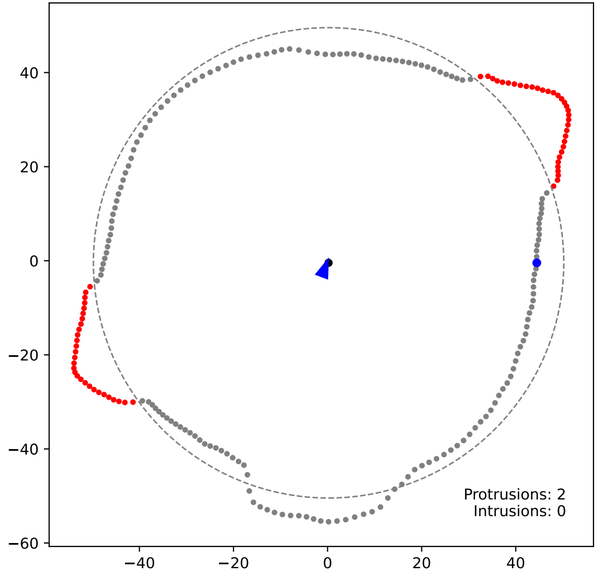

Shape evolution (t = 240.00)
Riemann Velocity: 0.1764
Max curvature: 0.0100
180
160
140
120
100
440
450
460
470
480
490
500

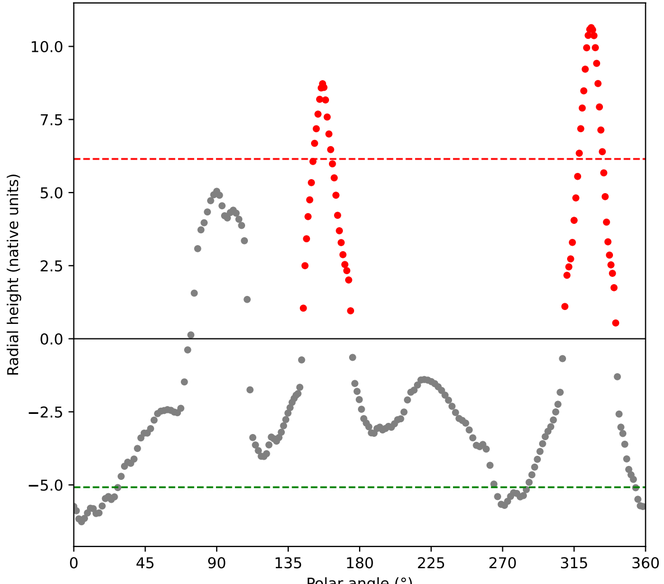

Topographical representation
Protrusions: 2
Intrusions: 0
40
20
0
−20
−40
−60
−40
−20
0
20
40

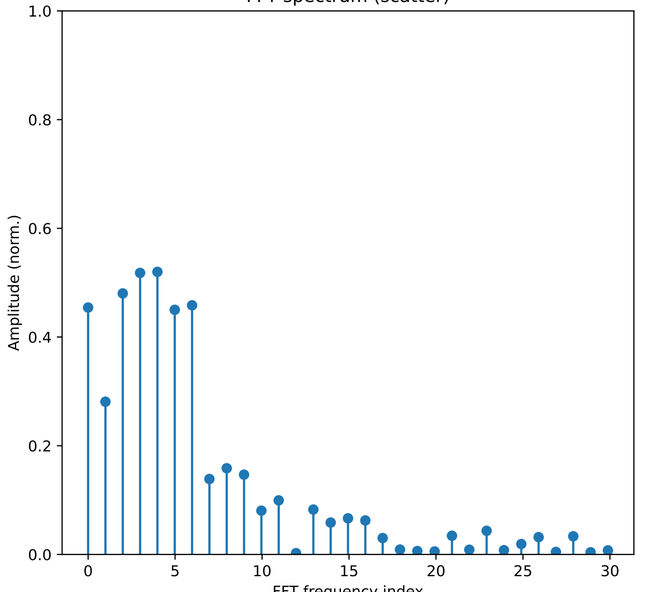

Topographical height
Radial height (native units)
Polar angle (°)
10.0
7.5
5.0
2.5
0.0
−2.5
−5.0
0
45
90
135
180
225
270
315
360

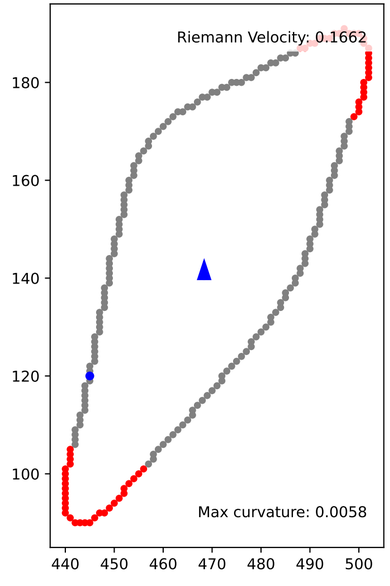

FFT spectrum (scatter)
Amplitude (norm.)
FFT frequency index
1.0
0.8
0.6
0.4
0.2
0.0
0
5
10
15
20
25
30

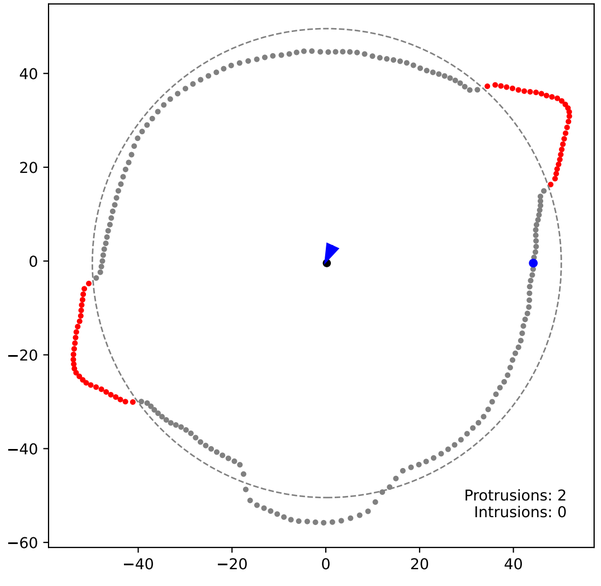

Shape evolution (t = 241.00)
Riemann Velocity: 0.1713
Max curvature: 0.0136
180
160
140
120
100
440
450
460
470
480
490
500

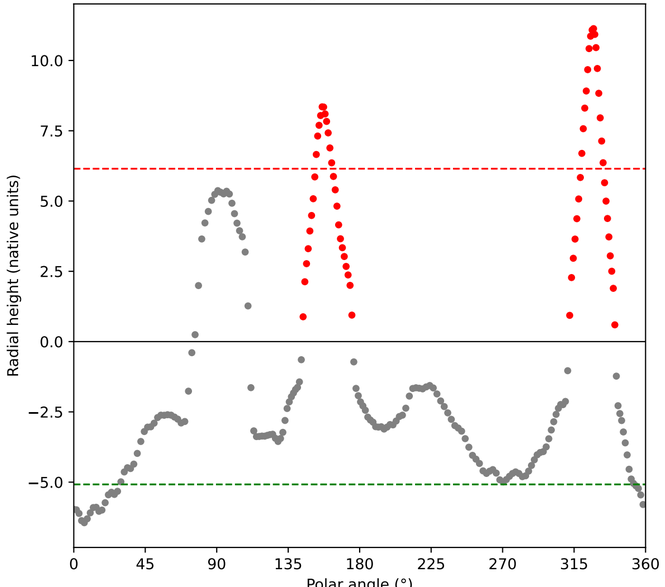

Topographical representation
Protrusions: 2
Intrusions: 0
40
20
0
−20
−40
−60
−40
−20
0
20
40

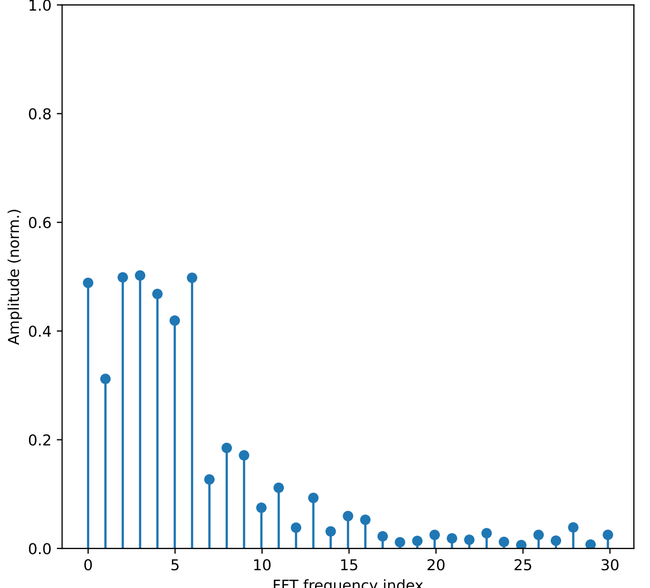

Topographical height
Radial height (native units)
Polar angle (°)
10.0
7.5
5.0
2.5
0.0
−2.5
−5.0
0
45
90
135
180
225
270
315
360

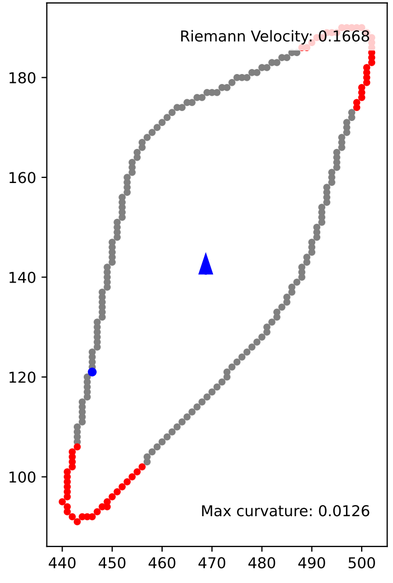

FFT spectrum (scatter)
Amplitude (norm.)
FFT frequency index
1.0
0.8
0.6
0.4
0.2
0.0
0
5
10
15
20
25
30

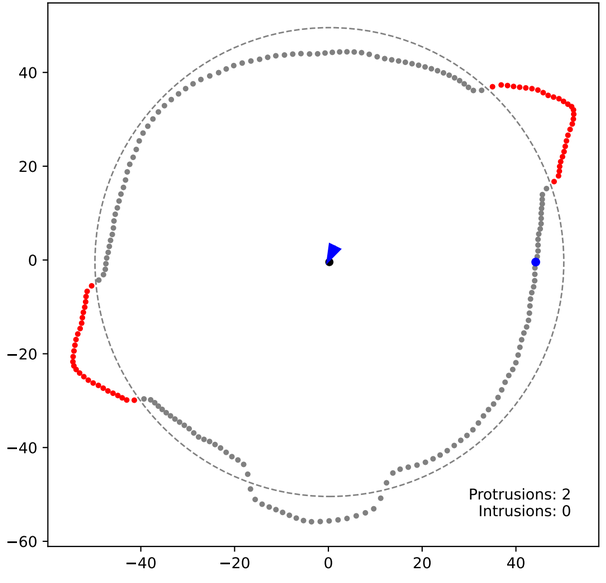

Shape evolution (t = 242.00)
Riemann Velocity: 0.1662
Max curvature: 0.0058
180
160
140
120
100
440
450
460
470
480
490
500

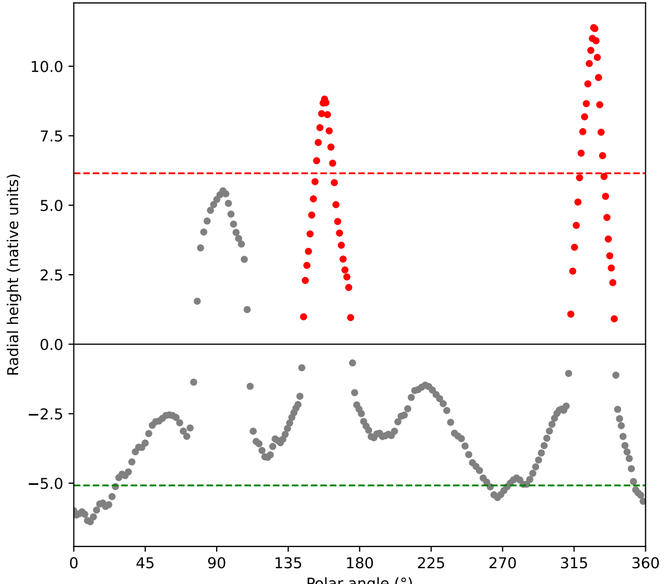

Topographical representation
Protrusions: 2
Intrusions: 0
40
20
0
−20
−40
−60
−40
−20
0
20
40

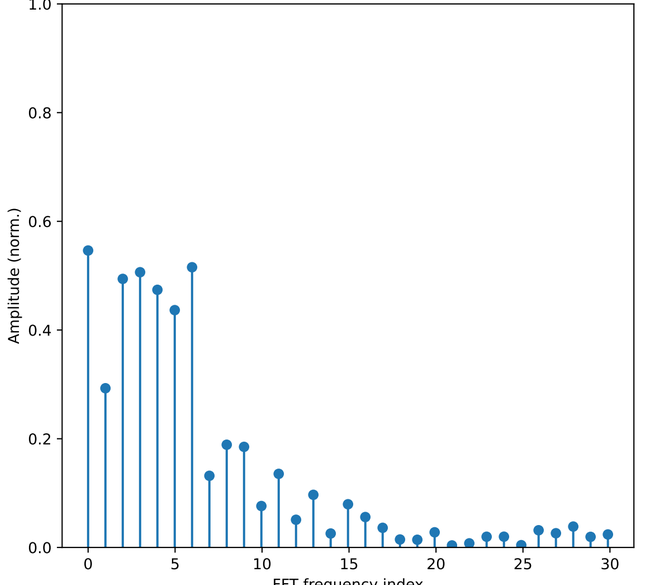

Topographical height
Radial height (native units)
Polar angle (°)
10.0
7.5
5.0
2.5
0.0
−2.5
−5.0
0
45
90
135
180
225
270
315
360

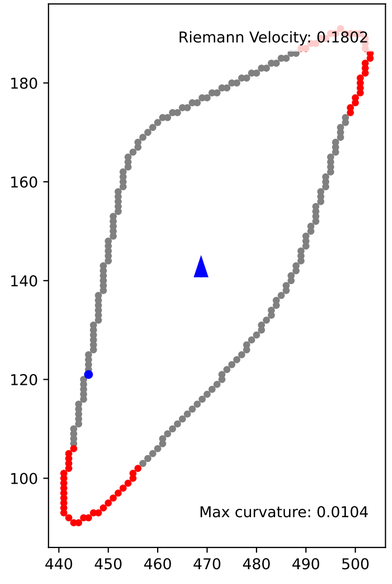

FFT spectrum (scatter)
Amplitude (norm.)
FFT frequency index
1.0
0.8
0.6
0.4
0.2
0.0
0
5
10
15
20
25
30

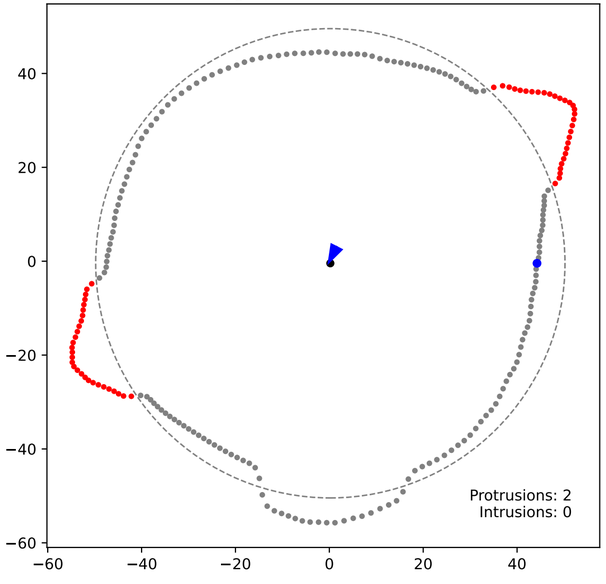

Shape evolution (t = 243.00)
Riemann Velocity: 0.1668
Max curvature: 0.0126
180
160
140
120
100
440
450
460
470
480
490
500

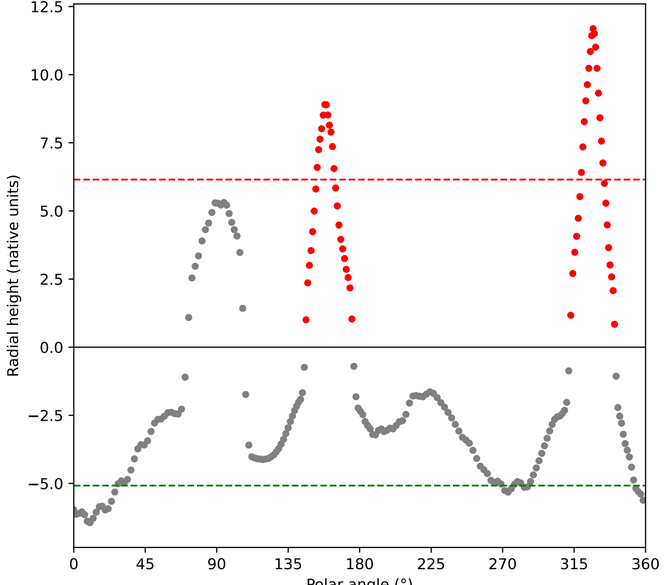

Topographical representation
Protrusions: 2
Intrusions: 0
40
20
0
−20
−40
−60
−40
−20
0
20
40

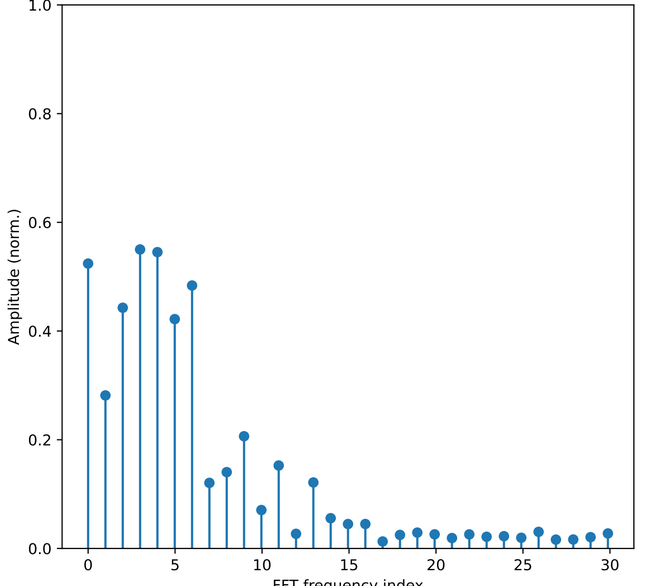

Topographical height
Radial height (native units)
Polar angle (°)
10.0
7.5
5.0
2.5
0.0
−2.5
−5.0
0
45
90
135
180
225
270
315
360

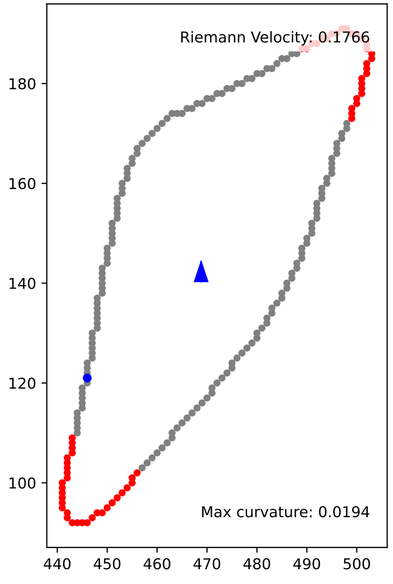

FFT spectrum (scatter)
Amplitude (norm.)
FFT frequency index
1.0
0.8
0.6
0.4
0.2
0.0
0
5
10
15
20
25
30

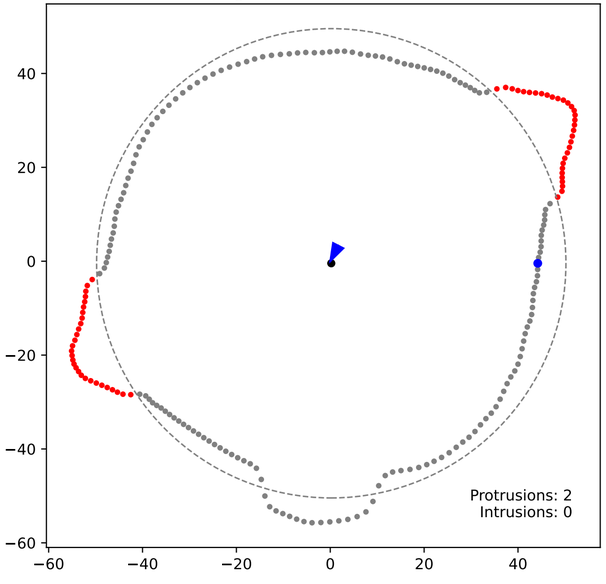

Shape evolution (t = 244.00)
Riemann Velocity: 0.1802
Max curvature: 0.0104
180
160
140
120
100
440
450
460
470
480
490
500

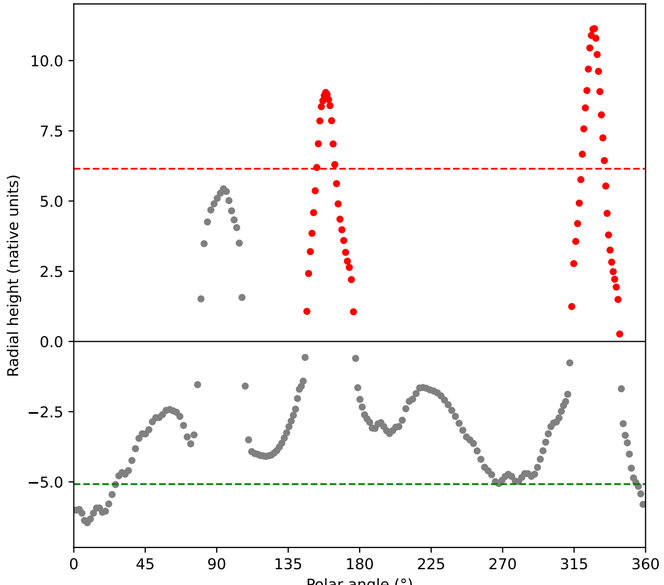

Topographical representation
Protrusions: 2
Intrusions: 0
40
20
0
−20
−40
−60
−60
−40
−20
0
20
40

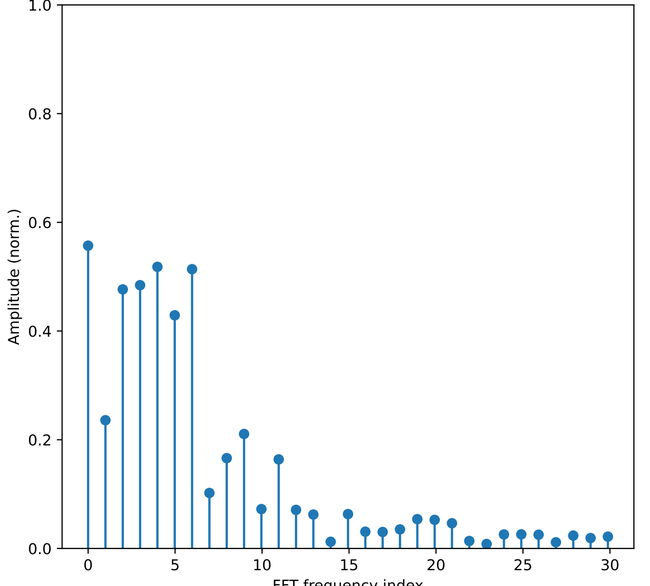

Topographical height
Radial height (native units)
Polar angle (°)
12.5
10.0
7.5
5.0
2.5
0.0
−2.5
−5.0
0
45
90
135
180
225
270
315
360

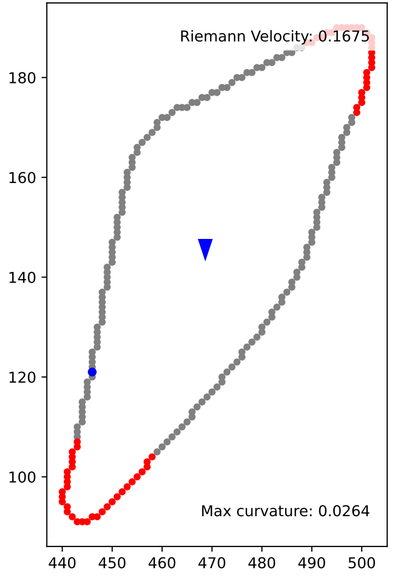

FFT spectrum (scatter)
Amplitude (norm.)
FFT frequency index
1.0
0.8
0.6
0.4
0.2
0.0
0
5
10
15
20
25
30

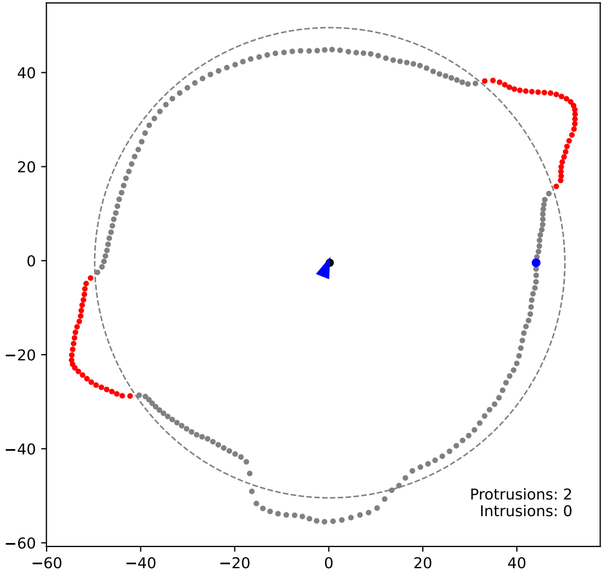

Shape evolution (t = 245.00)
Riemann Velocity: 0.1766
Max curvature: 0.0194
180
160
140
120
100
440
450
460
470
480
490
500

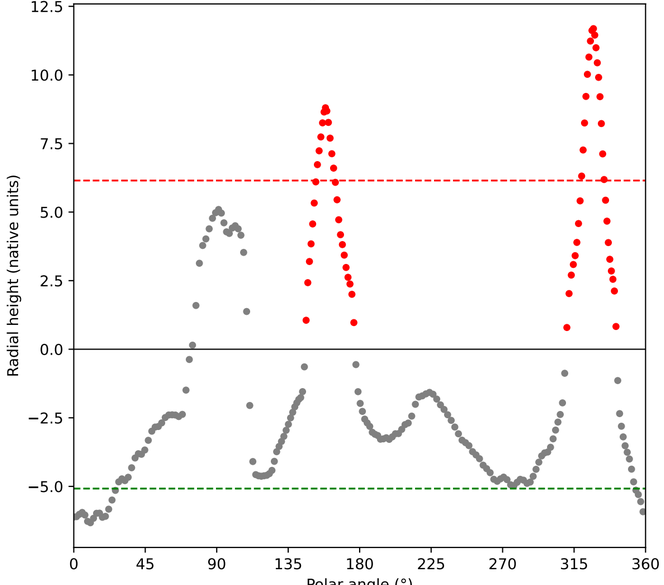

Topographical representation
Protrusions: 2
Intrusions: 0
40
20
0
−20
−40
−60
−60
−40
−20
0
20
40

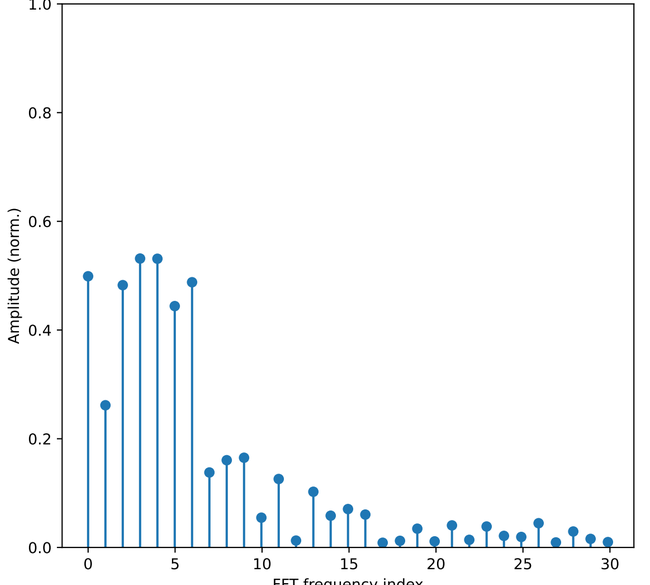

Topographical height
Radial height (native units)
Polar angle (°)
10.0
7.5
5.0
2.5
0.0
−2.5
−5.0
0
45
90
135
180
225
270
315
360

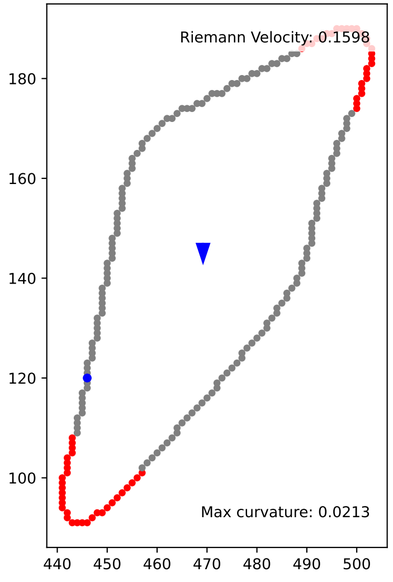

FFT spectrum (scatter)
Amplitude (norm.)
FFT frequency index
1.0
0.8
0.6
0.4
0.2
0.0
0
5
10
15
20
25
30

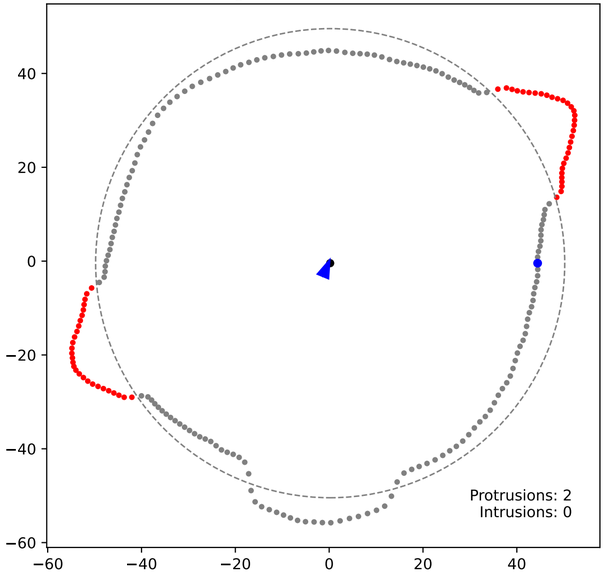

Shape evolution (t = 246.00)
Riemann Velocity: 0.1675
Max curvature: 0.0264
180
160
140
120
100
440
450
460
470
480
490
500

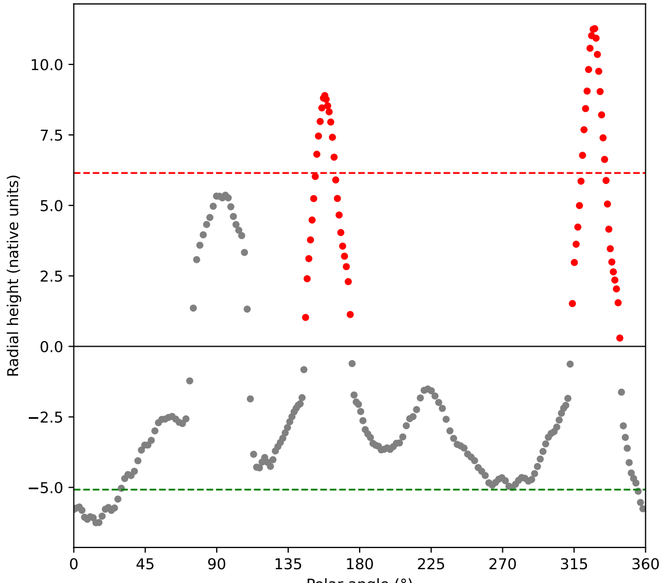

Topographical representation
Protrusions: 2
Intrusions: 0
40
20
0
−20
−40
−60
−60
−40
−20
0
20
40

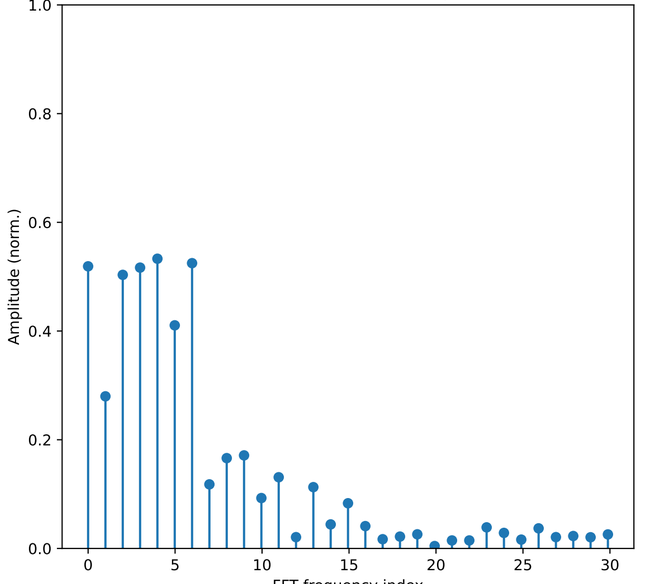

Topographical height
Radial height (native units)
Polar angle (°)
12.5
10.0
7.5
5.0
2.5
0.0
−2.5
−5.0
0
45
90
135
180
225
270
315
360

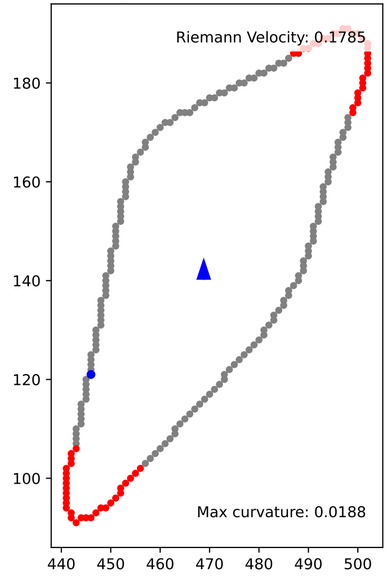

FFT spectrum (scatter)
Amplitude (norm.)
FFT frequency index
1.0
0.8
0.6
0.4
0.2
0.0
0
5
10
15
20
25
30

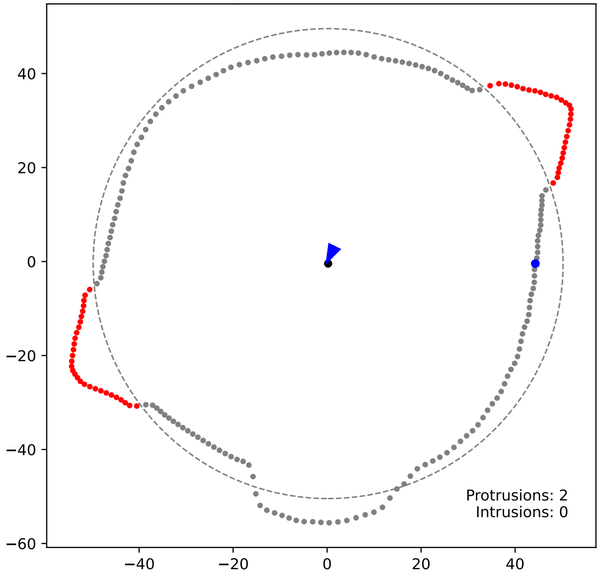

Shape evolution (t = 247.00)
Riemann Velocity: 0.1598
Max curvature: 0.0213
180
160
140
120
100
440
450
460
470
480
490
500

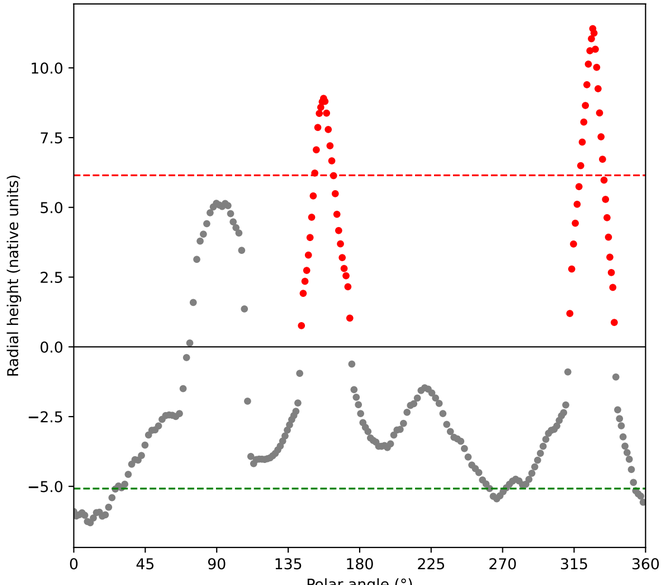

Topographical representation
Protrusions: 2
Intrusions: 0
40
20
0
−20
−40
−60
−60
−40
−20
0
20
40

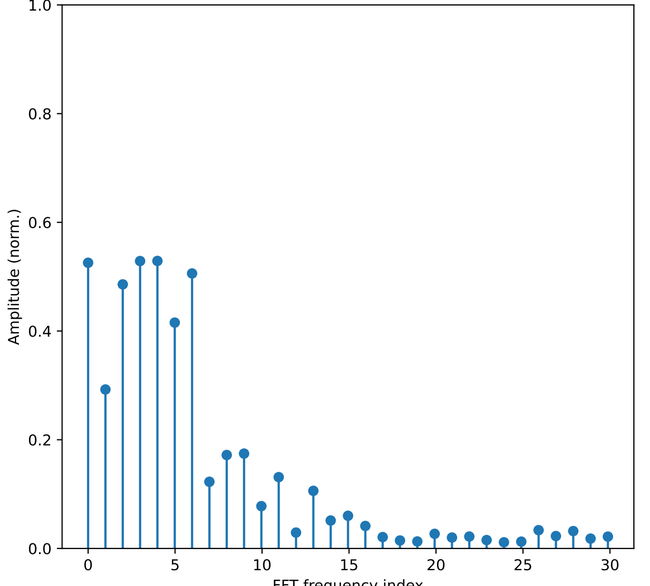

Topographical height
Radial height (native units)
Polar angle (°)
10.0
7.5
5.0
2.5
0.0
−2.5
−5.0
0
45
90
135
180
225
270
315
360

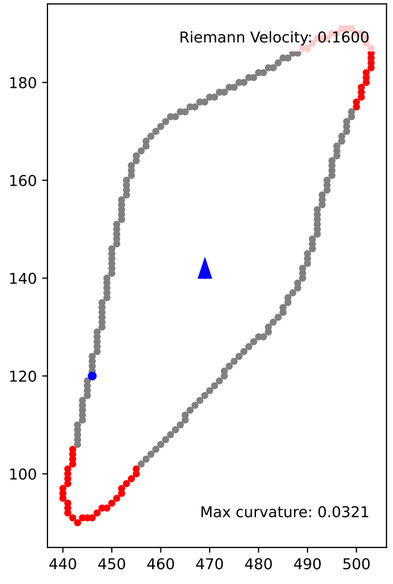

FFT spectrum (scatter)
Amplitude (norm.)
FFT frequency index
1.0
0.8
0.6
0.4
0.2
0.0
0
5
10
15
20
25
30

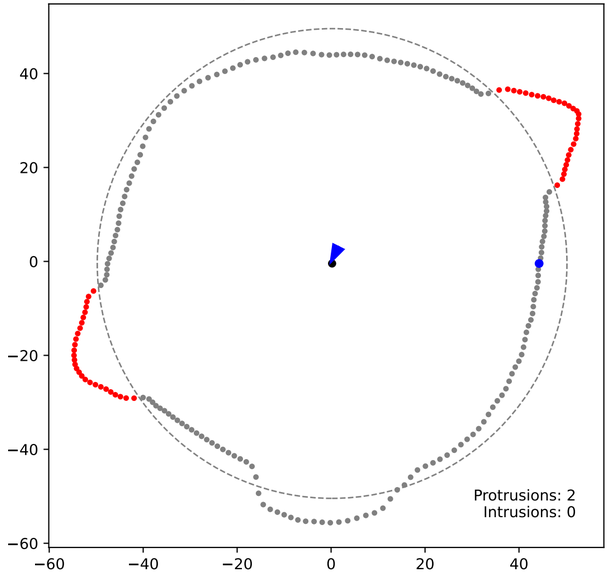

Shape evolution (t = 248.00)
Riemann Velocity: 0.1785
Max curvature: 0.0188
180
160
140
120
100
440
450
460
470
480
490
500

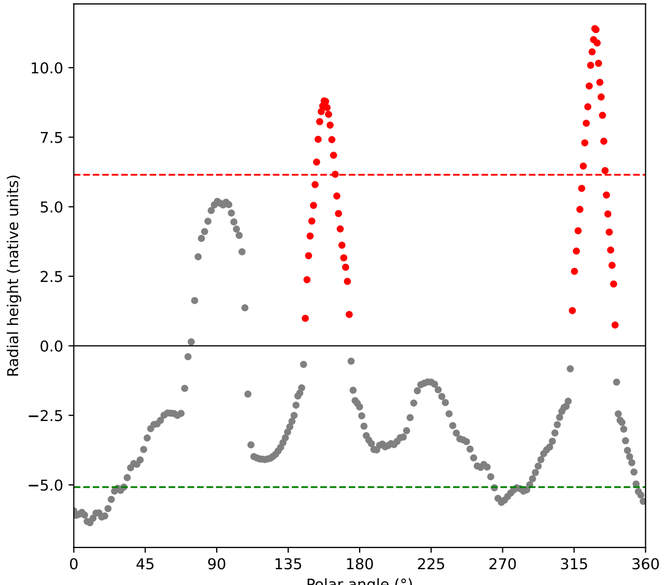

Topographical representation
Protrusions: 2
Intrusions: 0
40
20
0
−20
−40
−60
−40
−20
0
20
40

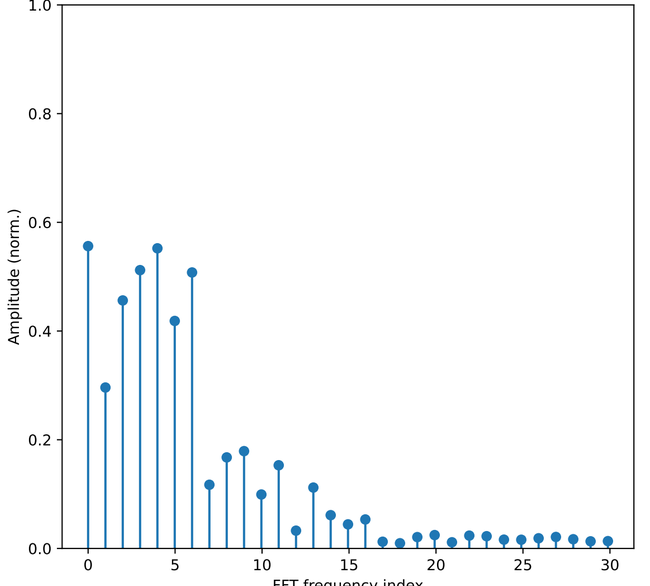

Topographical height
Radial height (native units)
Polar angle (°)
10.0
7.5
5.0
2.5
0.0
−2.5
−5.0
0
45
90
135
180
225
270
315
360

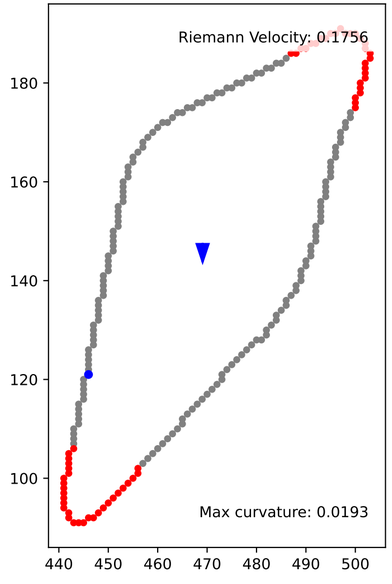

FFT spectrum (scatter)
Amplitude (norm.)
FFT frequency index
1.0
0.8
0.6
0.4
0.2
0.0
0
5
10
15
20
25
30

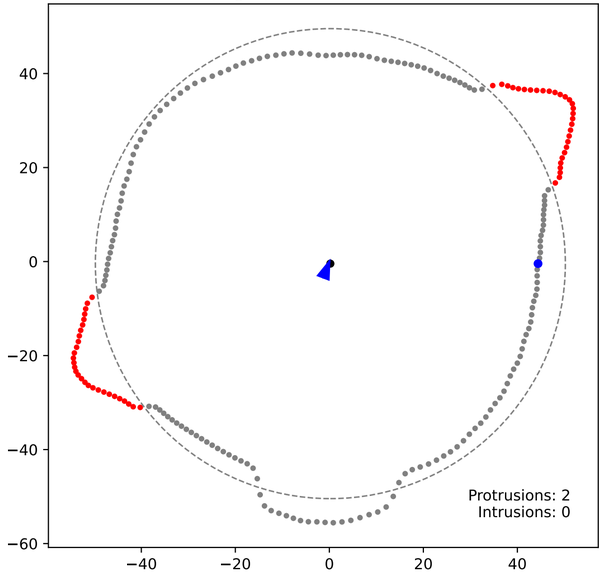

Shape evolution (t = 249.00)
Riemann Velocity: 0.1600
Max curvature: 0.0321
180
160
140
120
100
440
450
460
470
480
490
500

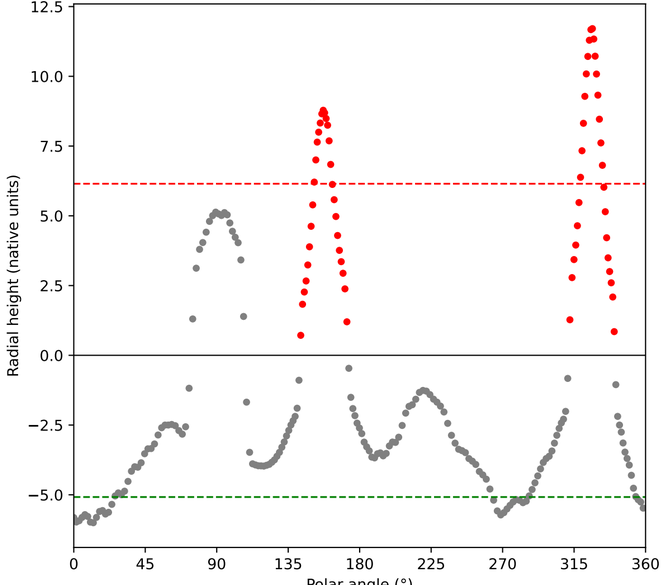

Topographical representation
Protrusions: 2
Intrusions: 0
40
20
0
−20
−40
−60
−60
−40
−20
0
20
40

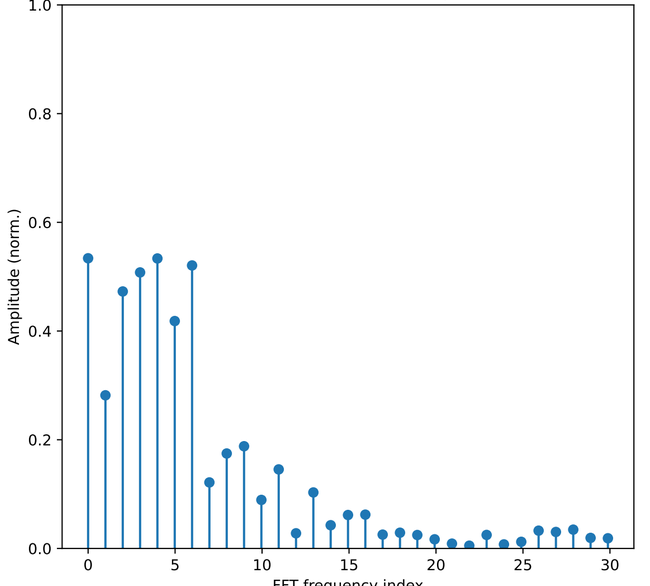

Topographical height
Radial height (native units)
Polar angle (°)
10.0
7.5
5.0
2.5
0.0
−2.5
−5.0
0
45
90
135
180
225
270
315
360

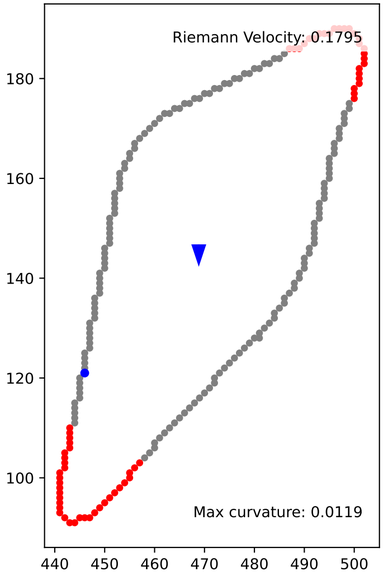

FFT spectrum (scatter)
Amplitude (norm.)
FFT frequency index
1.0
0.8
0.6
0.4
0.2
0.0
0
5
10
15
20
25
30

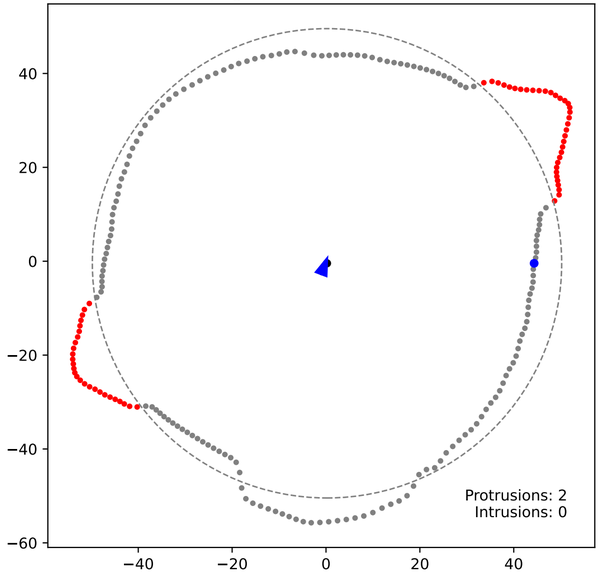

Shape evolution (t = 250.00)
Riemann Velocity: 0.1756
Max curvature: 0.0193
180
160
140
120
100
440
450
460
470
480
490
500

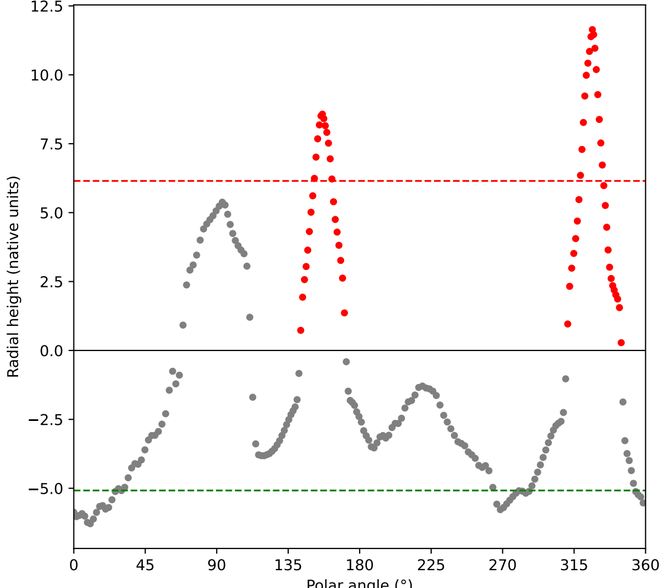

Topographical representation
Protrusions: 2
Intrusions: 0
40
20
0
−20
−40
−60
−40
−20
0
20
40

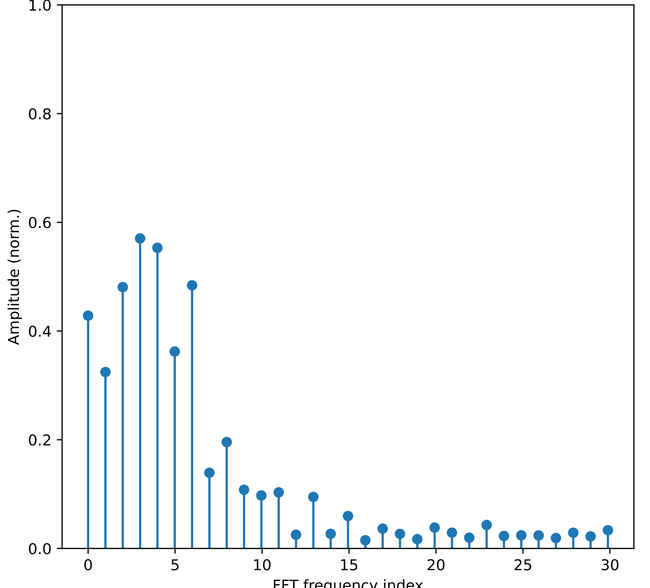

Topographical height
Radial height (native units)
Polar angle (°)
12.5
10.0
7.5
5.0
2.5
0.0
−2.5
−5.0
0
45
90
135
180
225
270
315
360

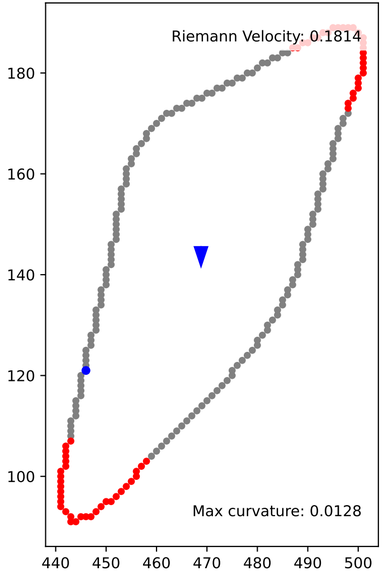

FFT spectrum (scatter)
Amplitude (norm.)
FFT frequency index
1.0
0.8
0.6
0.4
0.2
0.0
0
5
10
15
20
25
30


Shape evolution (t = 251.00)
Riemann Velocity: 0.1795
Max curvature: 0.0119
180
160
140
120
100
440
450
460
470
480
490
500


Topographical representation
Protrusions: 2
Intrusions: 0
40
20
0
−20
−40
−60
−40
−20
0
20
40


Topographical height
Radial height (native units)
Polar angle (°)
12.5
10.0
7.5
5.0
2.5
0.0
−2.5
−5.0
0
45
90
135
180
225
270
315
360


FFT spectrum (scatter)
Amplitude (norm.)
FFT frequency index
1.0
0.8
0.6
0.4
0.2
0.0
0
5
10
15
20
25
30


Shape evolution (t = 252.00)
Riemann Velocity: 0.1814
Max curvature: 0.0128
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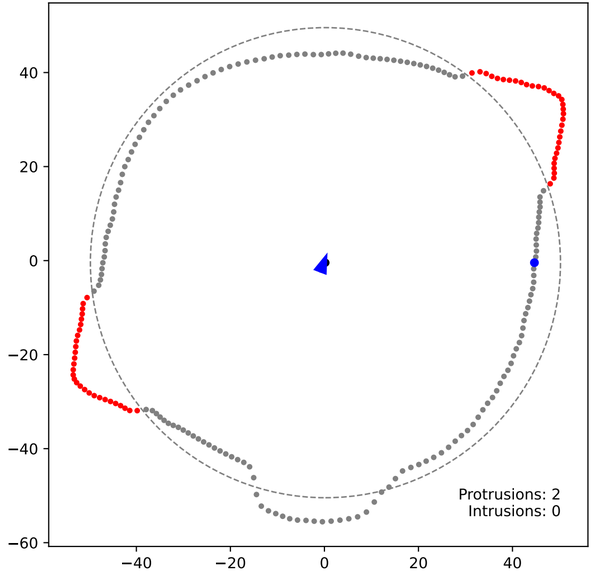
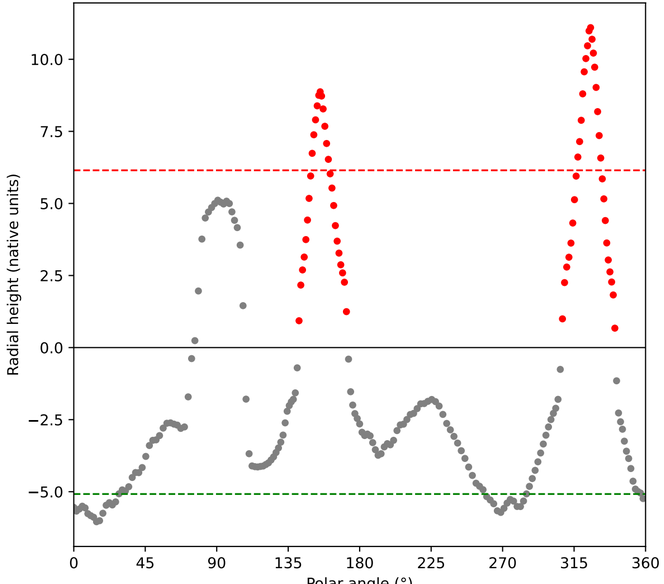
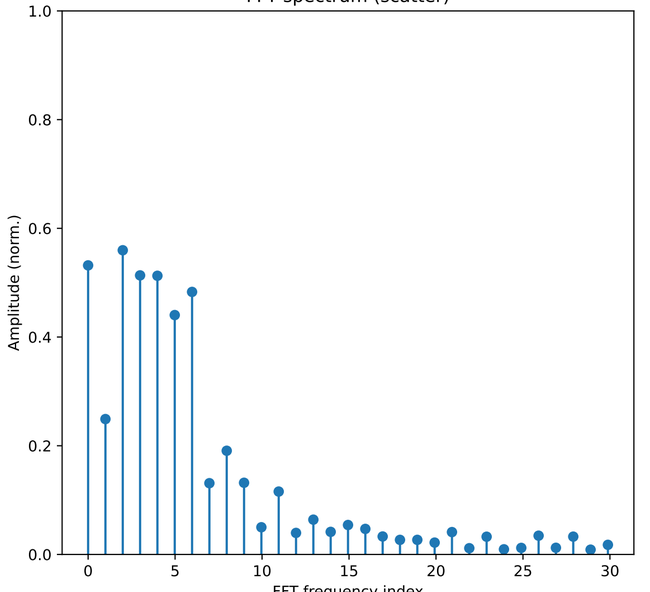
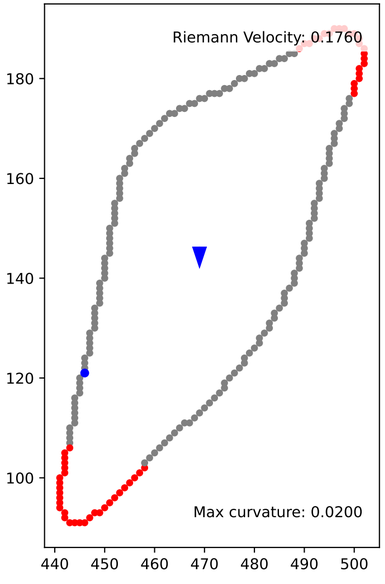
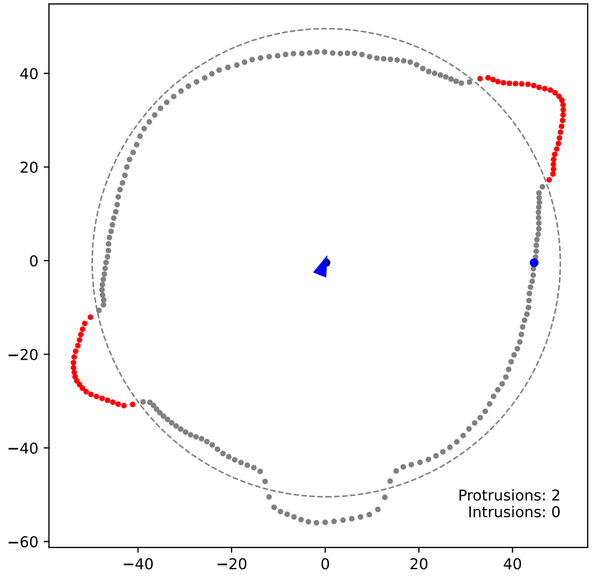
160
140
120
100
440
450
460
470
480
490
500

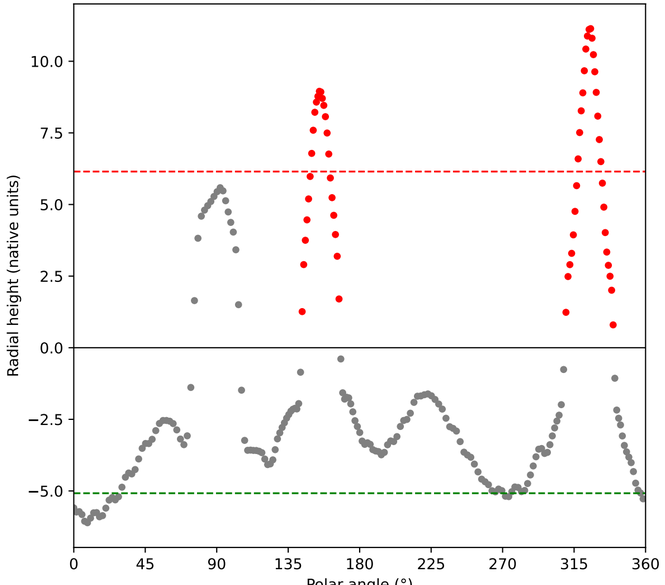

Topographical representation
Protrusions: 2
Intrusions: 0
40
20
0
−20
−40
−60
−40
−20
0
20
40

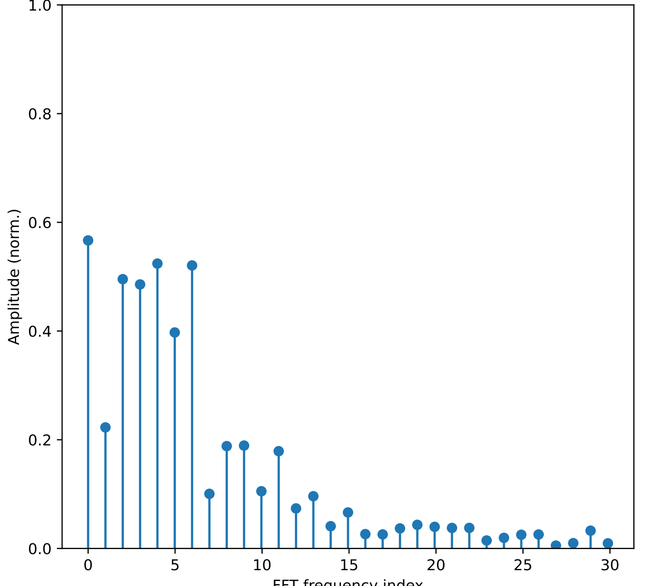

Topographical height
Radial height (native units)
Polar angle (°)
10.0
7.5
5.0
2.5
0.0
−2.5
−5.0
0
45
90
135
180
225
270
315
360

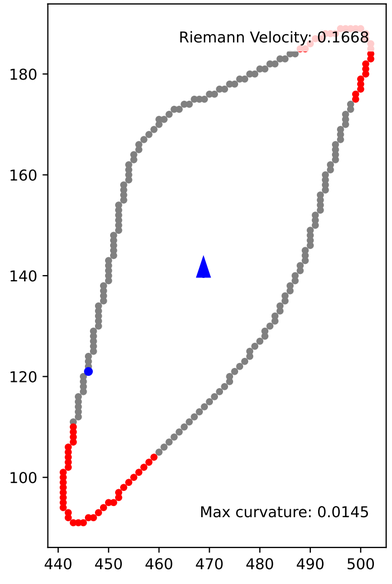

FFT spectrum (scatter)
Amplitude (norm.)
FFT frequency index
1.0
0.8
0.6
0.4
0.2
0.0
0
5
10
15
20
25
30


Shape evolution (t = 253.00)
Riemann Velocity: 0.1760
Max curvature: 0.0200
180
160
140
120
100
440
450
460
470
480
490
500


Topographical representation
Protrusions: 2
Intrusions: 0
40
20
0
−20
−40
−60
−40
−20
0
20
40


Topographical height
Radial height (native units)
Polar angle (°)
10.0
7.5
5.0
2.5
0.0
−2.5
−5.0
0
45
90
135
180
225
270
315
360


FFT spectrum (scatter)
Amplitude (norm.)
FFT frequency index
1.0
0.8
0.6
0.4
0.2
0.0
0
5
10
15
20
25
30


Shape evolution (t = 254.00)
Riemann Velocity: 0.1668
Max curvature: 0.0145
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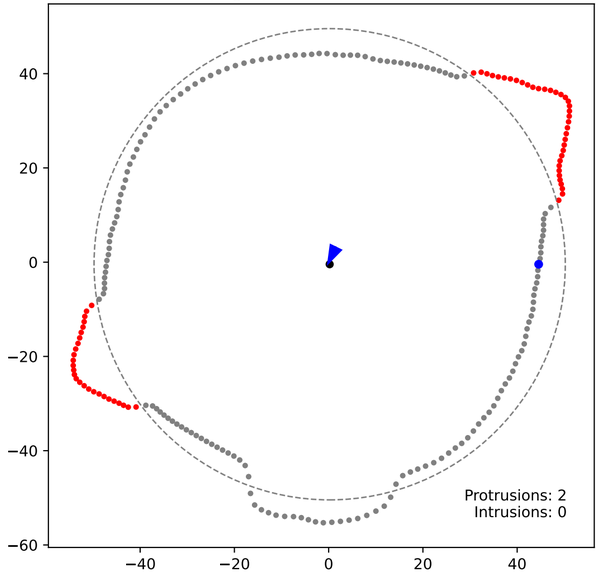
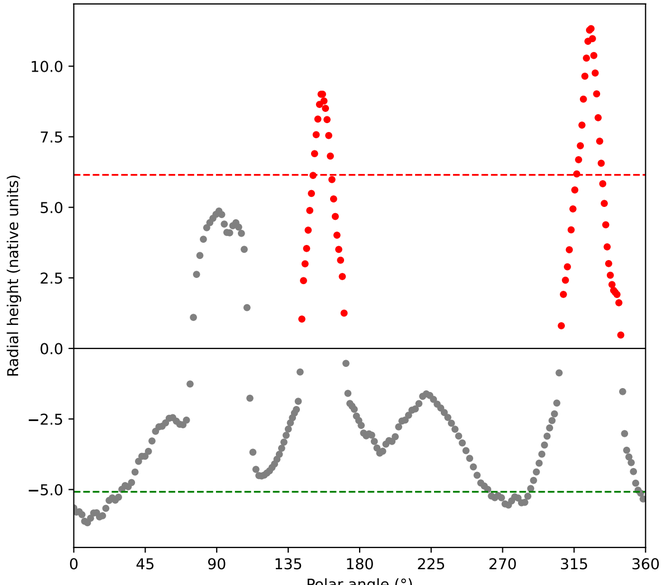
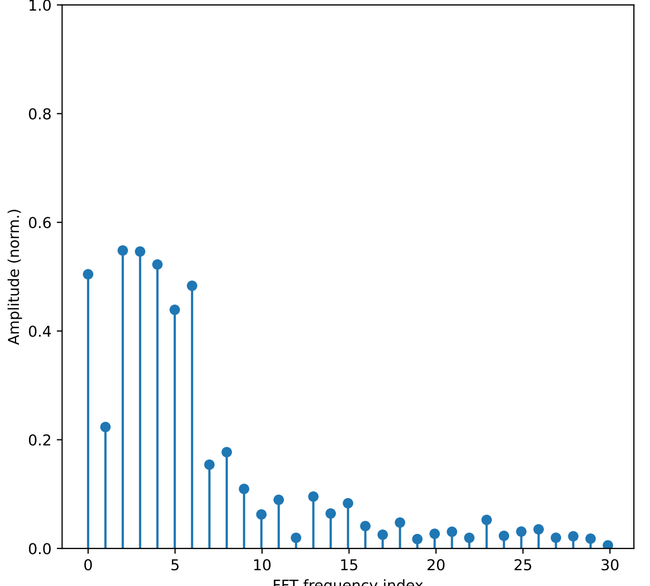
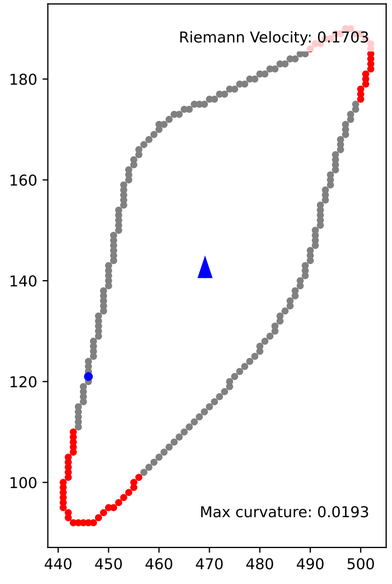
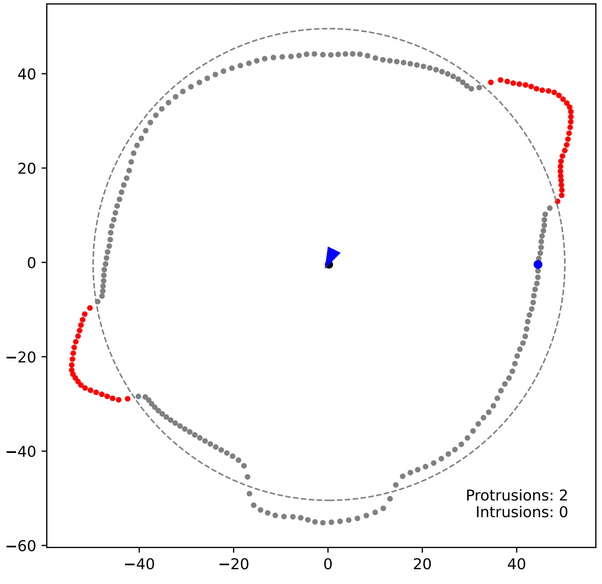
160
140
120
100
440
450
460
470
480
490
500

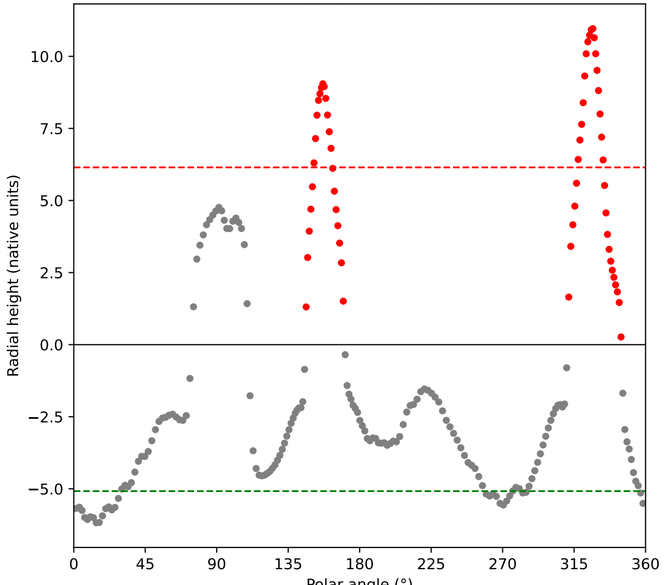

Topographical representation
Protrusions: 2
Intrusions: 0
40
20
0
−20
−40
−60
−40
−20
0
20
40

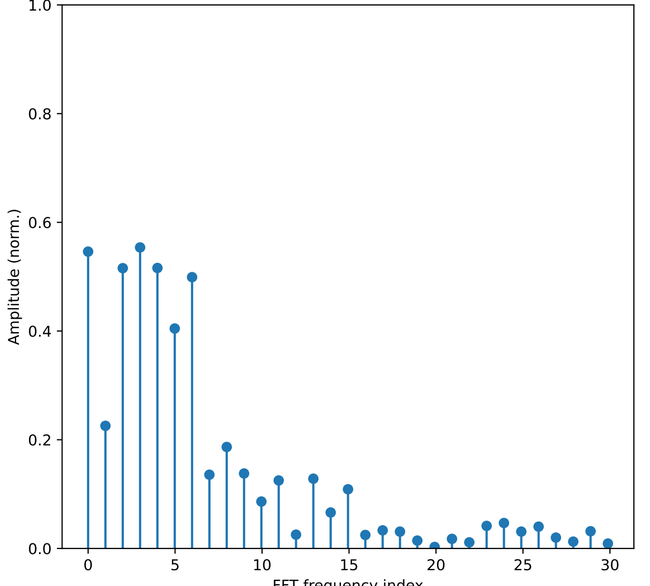

Topographical height
Radial height (native units)
Polar angle (°)
10.0
7.5
5.0
2.5
0.0
−2.5
−5.0
0
45
90
135
180
225
270
315
360


FFT spectrum (scatter)
Amplitude (norm.)
FFT frequency index
1.0
0.8
0.6
0.4
0.2
0.0
0
5
10
15
20
25
30


Shape evolution (t = 255.00)
Riemann Velocity: 0.1703
Max curvature: 0.0193
180
160
140
120
100
440
450
460
470
480
490
500


Topographical representation
Protrusions: 2
Intrusions: 0
40
20
0
−20
−40
−60
−40
−20
0
20
40


Topographical height
Radial height (native units)
Polar angle (°)
10.0
7.5
5.0
2.5
0.0
−2.5
−5.0
0
45
90
135
180
225
270
315
360


FFT spectrum (scatter)
Amplitude (norm.)
FFT frequency index
1.0
0.8
0.6
0.4
0.2
0.0
0
5
10
15
20
25
30