

## Per-file Report

File: Front\_EE-1\_4\_3000x.bmp

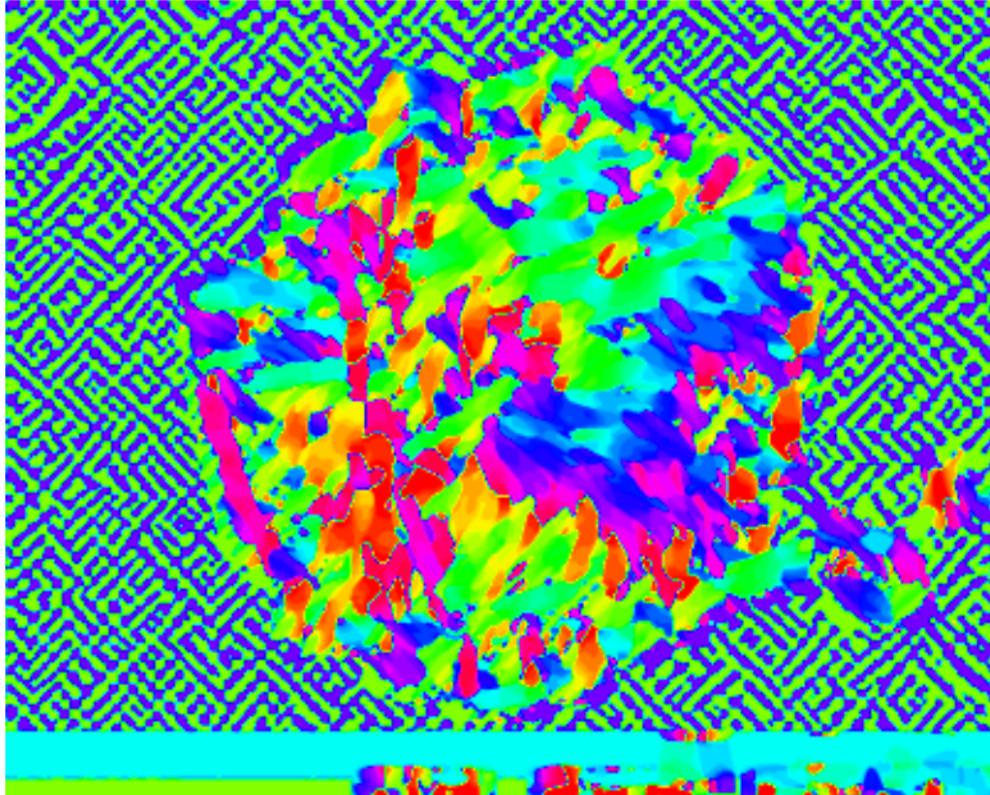
Pattern: Clockwise

n\_vectors: 179 | cw\_frac: 0.615 | acw\_frac: 0.385 | div\_frac: 1.000

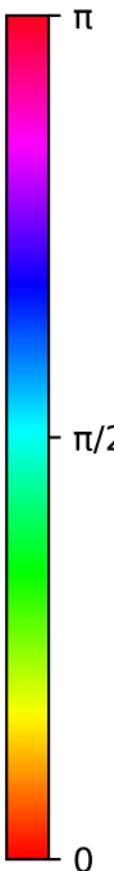
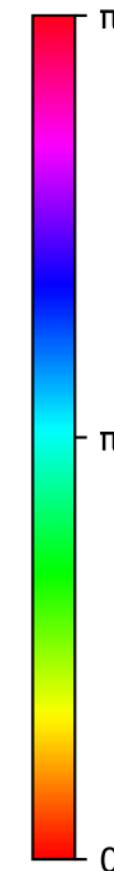
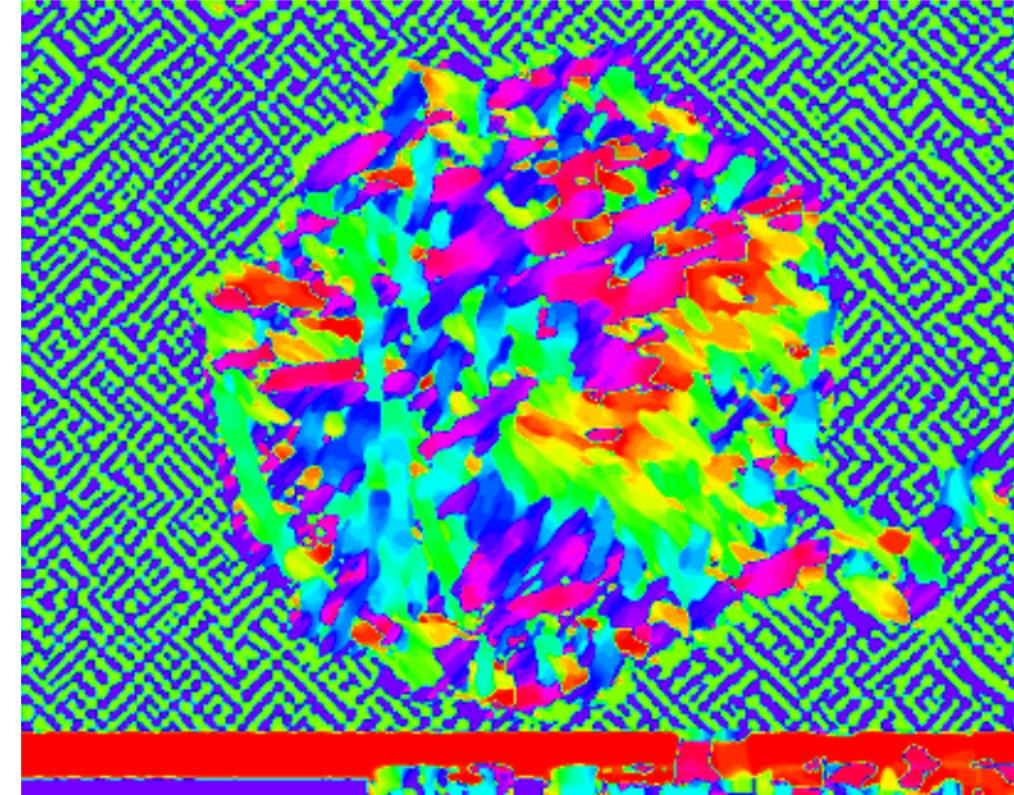
Rotation ( $\phi_{\perp \rightarrow \text{horizontal}}$ ): 63.83° | Center=(651,495)

Gabor angle maps (original, not rotated)

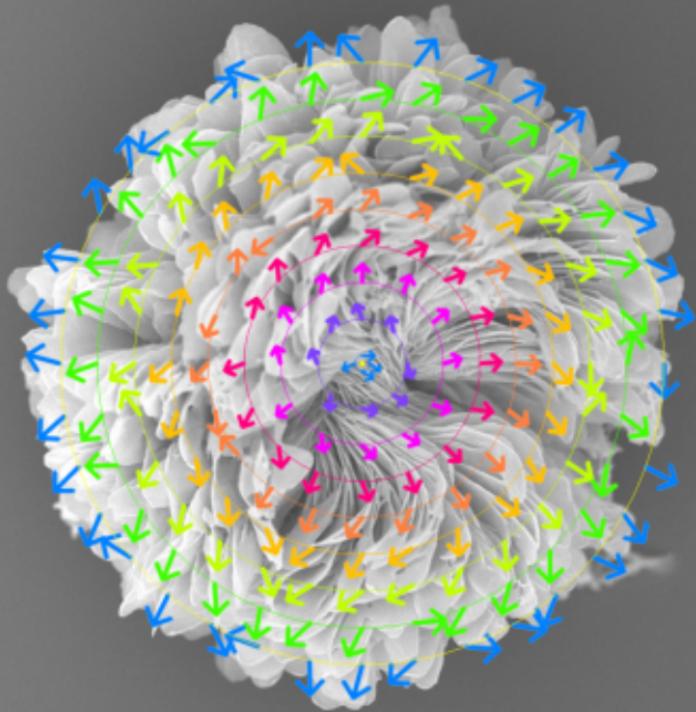
Dominant Tangent ( $0 \rightarrow \pi$ )



Dominant Normal ( $0 \rightarrow \pi$ )



Before rotation



X 3,000

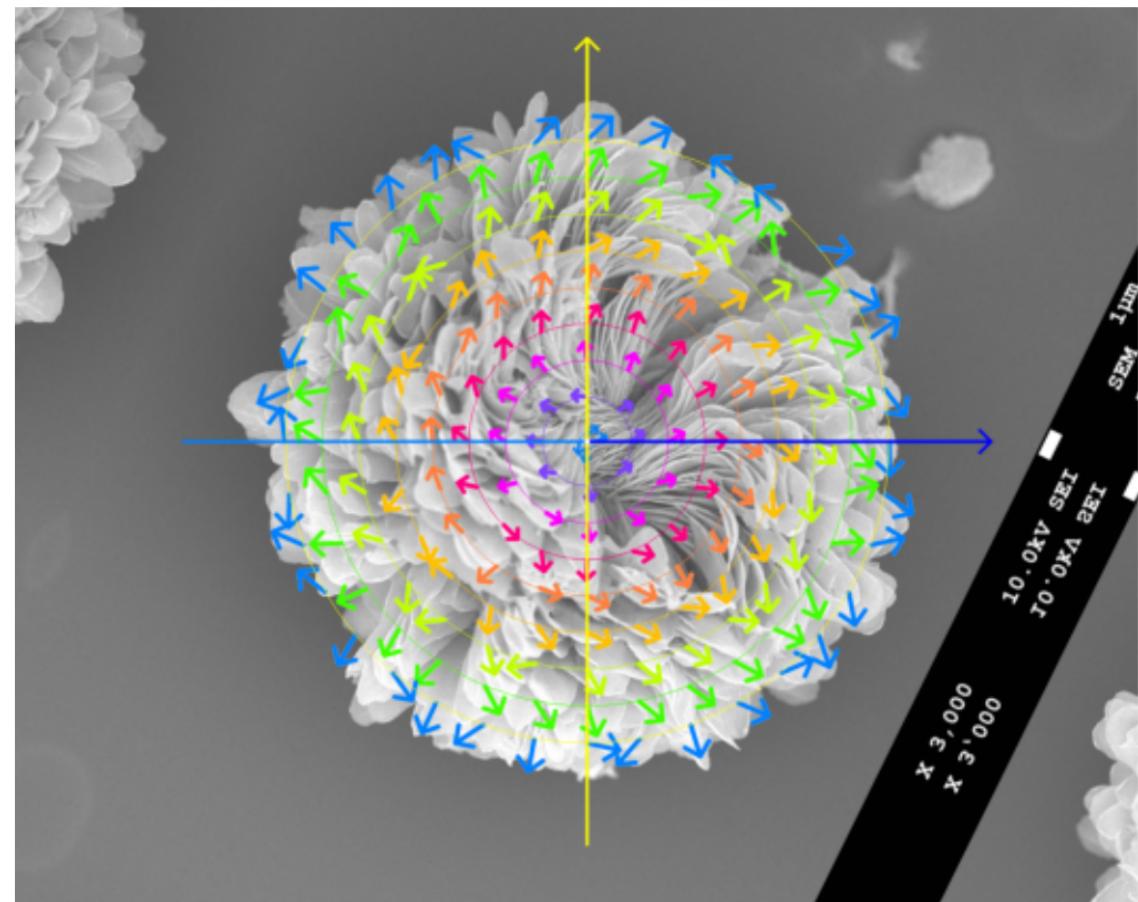
10.0kV SEI

SEM

1 $\mu$ m  
JEOL

WD 4.6mm

After rotation (Code A)  
(angle=63.83°)



$\times 3,000$

10.0kV SEI

SEM

1 $\mu$ m

# Ring coordinates + Angle( $\alpha'$ ) + Pattern (page 1/6)

| Ring | Coordinate        | Angle ( $\alpha'$ ) | Pattern       |
|------|-------------------|---------------------|---------------|
| 1    | (9.00, 0.00)      | 24.64               | Anticlockwise |
| 1    | (0.00, -9.00)     | -12.20              | Clockwise     |
| 1    | (-9.00, 0.00)     | 85.31               | Anticlockwise |
| 1    | (0.00, 9.00)      | -60.38              | Clockwise     |
| 2    | (51.00, 0.00)     | 42.22               | Anticlockwise |
| 2    | (36.00, -36.00)   | 79.64               | Anticlockwise |
| 2    | (0.00, -51.00)    | 19.91               | Anticlockwise |
| 2    | (-36.00, -36.00)  | -51.56              | Clockwise     |
| 2    | (-51.00, 0.00)    | -4.68               | Clockwise     |
| 2    | (-36.00, 36.00)   | 22.40               | Anticlockwise |
| 2    | (0.00, 51.00)     | 83.44               | Anticlockwise |
| 2    | (36.00, 36.00)    | -20.67              | Clockwise     |
| 3    | (93.00, 0.00)     | 30.20               | Anticlockwise |
| 3    | (81.00, -47.00)   | 45.23               | Anticlockwise |
| 3    | (47.00, -81.00)   | 26.11               | Anticlockwise |
| 3    | (0.00, -93.00)    | 11.69               | Anticlockwise |
| 3    | (-47.00, -81.00)  | 89.60               | Anticlockwise |
| 3    | (-81.00, -47.00)  | -14.99              | Clockwise     |
| 3    | (-93.00, 0.00)    | -31.86              | Clockwise     |
| 3    | (-81.00, 47.00)   | 1.43                | Anticlockwise |
| 3    | (-47.00, 81.00)   | 9.72                | Anticlockwise |
| 3    | (0.00, 93.00)     | 10.28               | Anticlockwise |
| 3    | (47.00, 81.00)    | 8.13                | Anticlockwise |
| 3    | (81.00, 47.00)    | 23.37               | Anticlockwise |
| 4    | (135.00, 0.00)    | 5.16                | Anticlockwise |
| 4    | (125.00, -52.00)  | 14.42               | Anticlockwise |
| 4    | (95.00, -95.00)   | -0.33               | Clockwise     |
| 4    | (52.00, -125.00)  | 55.60               | Anticlockwise |
| 4    | (0.00, -135.00)   | -3.63               | Clockwise     |
| 4    | (-52.00, -125.00) | 29.80               | Anticlockwise |

# Ring coordinates + Angle( $\alpha'$ ) + Pattern (page 2/6)

| Ring | Coordinate         | Angle ( $\alpha'$ ) | Pattern       |
|------|--------------------|---------------------|---------------|
| 4    | (-95.00, -95.00)   | 89.83               | Anticlockwise |
| 4    | (-125.00, -52.00)  | -35.91              | Clockwise     |
| 4    | (-135.00, 0.00)    | -41.65              | Clockwise     |
| 4    | (-125.00, 52.00)   | -52.06              | Clockwise     |
| 4    | (-95.00, 95.00)    | -45.46              | Clockwise     |
| 4    | (-52.00, 125.00)   | -23.51              | Clockwise     |
| 4    | (0.00, 135.00)     | -31.68              | Clockwise     |
| 4    | (52.00, 125.00)    | 5.65                | Anticlockwise |
| 4    | (95.00, 95.00)     | 6.85                | Anticlockwise |
| 4    | (125.00, 52.00)    | 8.04                | Anticlockwise |
| 5    | (176.00, 0.00)     | -31.57              | Clockwise     |
| 5    | (167.00, -54.00)   | -18.56              | Clockwise     |
| 5    | (142.00, -103.00)  | -23.73              | Clockwise     |
| 5    | (103.00, -142.00)  | -7.60               | Clockwise     |
| 5    | (54.00, -167.00)   | 47.51               | Anticlockwise |
| 5    | (0.00, -176.00)    | 65.72               | Anticlockwise |
| 5    | (-54.00, -167.00)  | 88.33               | Anticlockwise |
| 5    | (-103.00, -142.00) | -14.00              | Clockwise     |
| 5    | (-142.00, -103.00) | -81.31              | Clockwise     |
| 5    | (-167.00, -54.00)  | -86.67              | Clockwise     |
| 5    | (-176.00, 0.00)    | -84.92              | Clockwise     |
| 5    | (-167.00, 54.00)   | -48.47              | Clockwise     |
| 5    | (-142.00, 103.00)  | -73.54              | Clockwise     |
| 5    | (-103.00, 142.00)  | -38.08              | Clockwise     |
| 5    | (-54.00, 167.00)   | -29.53              | Clockwise     |
| 5    | (0.00, 176.00)     | -15.24              | Clockwise     |
| 5    | (54.00, 167.00)    | -17.30              | Clockwise     |
| 5    | (103.00, 142.00)   | -8.09               | Clockwise     |
| 5    | (142.00, 103.00)   | 0.37                | Anticlockwise |
| 5    | (167.00, 54.00)    | 8.84                | Anticlockwise |

# Ring coordinates + Angle( $\alpha'$ ) + Pattern (page 3/6)

| Ring | Coordinate         | Angle ( $\alpha'$ ) | Pattern       |
|------|--------------------|---------------------|---------------|
| 6    | (218.00, 0.00)     | -44.70              | Clockwise     |
| 6    | (211.00, -56.00)   | -71.56              | Clockwise     |
| 6    | (189.00, -109.00)  | -32.17              | Clockwise     |
| 6    | (154.00, -154.00)  | -35.32              | Clockwise     |
| 6    | (109.00, -189.00)  | 58.93               | Anticlockwise |
| 6    | (56.00, -211.00)   | 48.52               | Anticlockwise |
| 6    | (0.00, -218.00)    | 65.69               | Anticlockwise |
| 6    | (-56.00, -211.00)  | 49.63               | Anticlockwise |
| 6    | (-109.00, -189.00) | 20.56               | Anticlockwise |
| 6    | (-154.00, -154.00) | -82.00              | Clockwise     |
| 6    | (-189.00, -109.00) | 81.25               | Anticlockwise |
| 6    | (-211.00, -56.00)  | 35.68               | Anticlockwise |
| 6    | (-218.00, 0.00)    | -62.17              | Clockwise     |
| 6    | (-211.00, 56.00)   | -60.80              | Clockwise     |
| 6    | (-189.00, 109.00)  | 84.99               | Anticlockwise |
| 6    | (-154.00, 154.00)  | -65.02              | Clockwise     |
| 6    | (-109.00, 189.00)  | -6.81               | Clockwise     |
| 6    | (-56.00, 211.00)   | -27.36              | Clockwise     |
| 6    | (0.00, 218.00)     | -63.03              | Clockwise     |
| 6    | (56.00, 211.00)    | -47.39              | Clockwise     |
| 6    | (109.00, 189.00)   | -50.41              | Clockwise     |
| 6    | (154.00, 154.00)   | -18.68              | Clockwise     |
| 6    | (189.00, 109.00)   | -28.15              | Clockwise     |
| 6    | (211.00, 56.00)    | 3.66                | Anticlockwise |
| 7    | (260.00, 0.00)     | -49.94              | Clockwise     |
| 7    | (253.00, -58.00)   | -70.94              | Clockwise     |
| 7    | (234.00, -113.00)  | -55.49              | Clockwise     |
| 7    | (203.00, -162.00)  | -44.48              | Clockwise     |
| 7    | (162.00, -203.00)  | 47.42               | Anticlockwise |
| 7    | (113.00, -234.00)  | 32.25               | Anticlockwise |

# Ring coordinates + Angle( $\alpha'$ ) + Pattern (page 4/6)

| Ring | Coordinate         | Angle ( $\alpha'$ ) | Pattern       |
|------|--------------------|---------------------|---------------|
| 7    | (58.00, -253.00)   | 37.88               | Anticlockwise |
| 7    | (0.00, -260.00)    | 30.90               | Anticlockwise |
| 7    | (-58.00, -253.00)  | -67.51              | Clockwise     |
| 7    | (-113.00, -234.00) | 40.61               | Anticlockwise |
| 7    | (-162.00, -203.00) | -45.76              | Clockwise     |
| 7    | (-203.00, -162.00) | 45.40               | Anticlockwise |
| 7    | (-234.00, -113.00) | -41.06              | Clockwise     |
| 7    | (-253.00, -58.00)  | -43.85              | Clockwise     |
| 7    | (-260.00, 0.00)    | -70.35              | Clockwise     |
| 7    | (-253.00, 58.00)   | -55.53              | Clockwise     |
| 7    | (-234.00, 113.00)  | -37.28              | Clockwise     |
| 7    | (-203.00, 162.00)  | -69.56              | Clockwise     |
| 7    | (-162.00, 203.00)  | 66.93               | Anticlockwise |
| 7    | (-113.00, 234.00)  | -31.24              | Clockwise     |
| 7    | (-58.00, 253.00)   | -32.47              | Clockwise     |
| 7    | (0.00, 260.00)     | -43.31              | Clockwise     |
| 7    | (58.00, 253.00)    | -37.38              | Clockwise     |
| 7    | (113.00, 234.00)   | -87.65              | Clockwise     |
| 7    | (162.00, 203.00)   | 55.98               | Anticlockwise |
| 7    | (203.00, 162.00)   | -7.26               | Clockwise     |
| 7    | (234.00, 113.00)   | -8.99               | Clockwise     |
| 7    | (253.00, 58.00)    | -33.97              | Clockwise     |
| 8    | (302.00, 0.00)     | -51.83              | Clockwise     |
| 8    | (296.00, -59.00)   | 28.08               | Anticlockwise |
| 8    | (279.00, -116.00)  | 25.71               | Anticlockwise |
| 8    | (251.00, -168.00)  | -34.71              | Clockwise     |
| 8    | (214.00, -214.00)  | 21.76               | Anticlockwise |
| 8    | (168.00, -251.00)  | 28.53               | Anticlockwise |
| 8    | (116.00, -279.00)  | 29.65               | Anticlockwise |
| 8    | (59.00, -296.00)   | 40.34               | Anticlockwise |

# Ring coordinates + Angle( $\alpha'$ ) + Pattern (page 5/6)

| Ring | Coordinate         | Angle ( $\alpha'$ ) | Pattern       |
|------|--------------------|---------------------|---------------|
| 8    | (0.00, -302.00)    | 18.95               | Anticlockwise |
| 8    | (-59.00, -296.00)  | 43.65               | Anticlockwise |
| 8    | (-116.00, -279.00) | 49.83               | Anticlockwise |
| 8    | (-168.00, -251.00) | -13.79              | Clockwise     |
| 8    | (-214.00, -214.00) | 15.04               | Anticlockwise |
| 8    | (-251.00, -168.00) | -8.97               | Clockwise     |
| 8    | (-279.00, -116.00) | -21.09              | Clockwise     |
| 8    | (-296.00, -59.00)  | -60.83              | Clockwise     |
| 8    | (-302.00, 0.00)    | -30.01              | Clockwise     |
| 8    | (-296.00, 59.00)   | 20.09               | Anticlockwise |
| 8    | (-279.00, 116.00)  | -58.67              | Clockwise     |
| 8    | (-251.00, 168.00)  | 5.07                | Anticlockwise |
| 8    | (-214.00, 214.00)  | -66.91              | Clockwise     |
| 8    | (-168.00, 251.00)  | -4.67               | Clockwise     |
| 8    | (-116.00, 279.00)  | -14.26              | Clockwise     |
| 8    | (-59.00, 296.00)   | -28.32              | Clockwise     |
| 8    | (0.00, 302.00)     | -28.22              | Clockwise     |
| 8    | (59.00, 296.00)    | -50.90              | Clockwise     |
| 8    | (116.00, 279.00)   | -62.46              | Clockwise     |
| 8    | (168.00, 251.00)   | -20.68              | Clockwise     |
| 8    | (214.00, 214.00)   | 51.57               | Anticlockwise |
| 8    | (251.00, 168.00)   | -25.22              | Clockwise     |
| 8    | (279.00, 116.00)   | -37.22              | Clockwise     |
| 8    | (296.00, 59.00)    | -38.81              | Clockwise     |
| 9    | (344.00, 0.00)     | -88.99              | Clockwise     |
| 9    | (339.00, -60.00)   | -25.55              | Clockwise     |
| 9    | (323.00, -118.00)  | 32.45               | Anticlockwise |
| 9    | (298.00, -172.00)  | -49.86              | Clockwise     |
| 9    | (264.00, -221.00)  | -31.22              | Clockwise     |
| 9    | (221.00, -264.00)  | 73.65               | Anticlockwise |

# Ring coordinates + Angle( $\alpha'$ ) + Pattern (page 6/6)

| Ring    | Coordinate         | Angle ( $\alpha'$ ) | Pattern       |
|---------|--------------------|---------------------|---------------|
| 9       | (172.00, -298.00)  | 36.42               | Anticlockwise |
| 9       | (118.00, -323.00)  | -2.63               | Clockwise     |
| 9       | (60.00, -339.00)   | -51.33              | Clockwise     |
| 9       | (0.00, -344.00)    | 77.70               | Anticlockwise |
| 9       | (-60.00, -339.00)  | -0.49               | Clockwise     |
| 9       | (-118.00, -323.00) | -36.83              | Clockwise     |
| 9       | (-172.00, -298.00) | 4.92                | Anticlockwise |
| 9       | (-221.00, -264.00) | 76.05               | Anticlockwise |
| 9       | (-264.00, -221.00) | 20.67               | Anticlockwise |
| 9       | (-298.00, -172.00) | -68.27              | Clockwise     |
| 9       | (-323.00, -118.00) | -43.77              | Clockwise     |
| 9       | (-339.00, -60.00)  | 78.12               | Anticlockwise |
| 9       | (-344.00, 0.00)    | -82.95              | Clockwise     |
| 9       | (-339.00, 60.00)   | 34.22               | Anticlockwise |
| 9       | (-323.00, 118.00)  | 81.06               | Anticlockwise |
| 9       | (-298.00, 172.00)  | -8.61               | Clockwise     |
| 9       | (-264.00, 221.00)  | -6.25               | Clockwise     |
| 9       | (-221.00, 264.00)  | -31.33              | Clockwise     |
| 9       | (-172.00, 298.00)  | -26.53              | Clockwise     |
| 9       | (-118.00, 323.00)  | 41.80               | Anticlockwise |
| 9       | (-60.00, 339.00)   | -51.34              | Clockwise     |
| 9       | (0.00, 344.00)     | -47.35              | Clockwise     |
| 9       | (60.00, 339.00)    | -53.13              | Clockwise     |
| 9       | (171.00, 297.00)   | 76.86               | Anticlockwise |
| 9       | (221.00, 264.00)   | 89.20               | Anticlockwise |
| 9       | (264.00, 221.00)   | -47.74              | Clockwise     |
| 9       | (298.00, 172.00)   | -57.08              | Clockwise     |
| 9       | (323.00, 118.00)   | 14.49               | Anticlockwise |
| 9       | (339.00, 60.00)    | -63.12              | Clockwise     |
| SUMMARY | n_vectors=179      | nan                 | Clockwise     |