NEWS PRESENCE OF ASTEROID NAMES RELATES TO ANGLES TO SUN

-- COLLECTION STARTED ON FEB 15, 2022-- EVALUATED DAILY UNTIL CIRCA FEB 15, 2027 -- HERE ARE DAILY AGGREGATE RESULTS

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17358 Lozino-Lozinskij (1978 SU4), 27049 Kraus (1998 SB3), 4885 Grange (1980 LU),
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8420 Angrogna (1996 WQ), 22442 Blaha (1996 TM9), 26757 Bastei (2001 KU17),
928 Hildrun (1920 GP), 20323 Tomlindstom (1998 HC21), 3996 Fugaku (1988 XG1),
7015 Schopenhauer (1990 QC8), 6332 Vorarlberg (1992 FP3), 777 Gutemberga (1914 TZ),
278 Paulina, 4687 Brunsandrej (1979 SJ11), 6898 Saint-Marys (1988 LE),
9661 Hohmann (1996 FU13), 8906 Yano (1995 WF2), 5239 Reiki (1990 VC4),
786 Bredichina (1914 UO), 6128 Lasorda (1989 LA), 22581 Rosahemphill (1998 HH77),
3523 Arina (1975 TV2), 11147 Delmas (1997 XT5), 17720 Manuboccuni (1997 XH10),
17097 Ronneuman (1999 JX31), 1841 Masaryk (1971 UO1), 11322 Aquamarine (1995 QT),
1244 Deira (1932 KE), 22998 Waltimyer (1999 VY70), 8443 Svecica (4343 T-3),
10965 van Leverink (3297 T-1), 1269 Rollandia (1930 SH), 3765 Texereau (1982 SU1),

721 Tabora (1911 MZ) , 8296 Miyama (1993 AD) , 7506 Lub (4837 P-L) ,
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897 Lysistrata (1918 DZ) , 20964 Mons Naklethi (1977 UA) , 1859 Kovalevskaya (1972 RS2) ,
3803 Tuchkova (1981 TP1) , 19517 Robertocarlos (1998 SK164) , 3654 AAS (1949 QH1) ,
5837 Hedin (2548 P-L) , 29 Amphitrite , 8966 Hortulana (3287 T-1) ,
7665 Putignano (1994 TK3) , 1592 Mathieu (1951 LA) , 1550 Tito (1937 WD) ,
368 Haidea (1893 AB) , 24028 Veronicaduys (1999 RP182) , 13234 Natashaowen (1998 FC74) ,
2225 Serkowski (6546 P-L) , 2866 Hardy (1961 TA) , 994 Otthild (1923 NL) ,
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3342 Fivesparks (1982 BD3) , 21432 Polingloh (1998 FJ115) , 706 Hirundo (1910 KX) ,
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11444 Peshekhonov (1978 QA2) , 20309 Batalden (1998 FD110) , 19420 Vivekbuch (1998 FB54) ,
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18818 Yasuhiko (1999 MB2) , 8387 Fujimori (1993 DO) , 12191 Vorontsova (1978 TT8) ,
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5757 Ticha (1967 JN) , 5824 Inagaki (1989 YM) , 11945 Amsterdam (1993 PC5) ,

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2654 Ristenpart (1968 OG) , 3557 Sokolsky (1977 QE1) , 10638 McGlothlin (1998 SV54) ,
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4014 Heizman (1979 SG10) , 31823 Viete (1999 TN3) , 3192 A'Hearn (1982 BY1) ,
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632 Pyrrha (1907 YX) , 21369 Gertfinger (1997 NO4) , 8538 Gammelmaja (1993 FR26) ,
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1192 Prisma (1931 FE) , 15382 Vian (1997 SN) , 13982 Thunberg (1992 RB3) ,
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7054 Brehm (1989 GL8) , 19593 Justinkoh (1999 NZ29) , 1868 Thersites (2008 P-L) ,

753 Tiflis (1913 RM) , 11348 Allegra (1997 BG9) , 9689 Freudenthal (4831 P-L) , 3238 Timresovia (1975 VB9) , 7291 Hyakutake (1991 XC1) , 18702 Sadowski (1998 HG68) , 522 Helga (1904 NC) , 8236 Gainsborough (4040 P-L) , 7766 Jododaira (1991 BH2) , 2510 Shandong (1979 TH) , 10720 Danzl (1986 GY) , 5865 Qualytemocrina (1984 QQ) , 10167 Yoshiwatiso (1995 BQ15) , 7461 Kachmokiam (1984 TD) , 5683 Bifukumonin (1990 UD) , 13009 Voloshchuk (1985 PB2) , 579 Sidonia (1905 SD) , 896 Sphinx (1918 DV) , 1732 Heike (1943 EY) , 794 Irenaea (1914 VB) , 20834 Allihewlett (2000 UM48) , 23011 Petach (1999 VG163) , 5875 Kuga (1989 XO) , 561 Ingwelde (1905 QG) , 1757 Porvoo (1939 FC) , 21363 Jotwani (1997 HX11) , 6051 Anaximenes (1992 BX1) , 2180 Marjaleena (1940 RJ) , 3052 Herzen (1976 YJ3) , 7203 Sigeki (1995 DG2) , 3087 Beatrice Tinsley (1981 QJ1) , 3337 Milos (1971 UG1) , 5871 Bobbell (1989 CE2) , 7623 Stamitz (9508 P-L) , 2912 Lapalma (1942 DM) , 20821 Balasridhar (2000 UT5) , 481 Emita (1902 HP) , 11713 Stubbs (1998 HG51) , 1224 Fantasia (1927 SD) , 3222 Liller (1983 NJ) , 35229 Benckert (1995 FY20) , 10982 Poerink (2672 T-3) , 807 Ceraskia (1915 WY) , 5411 Liia (1973 AT3) , 4536 Drewpinsky (1987 DA6) , 301 Bavaria , 6400 Georgealexander (1991 GQ1) , 16888 Michaelbarber (1998 BM26) , 7504 Kawakita (1997 AF1) , 1477 Bonsdorffia (1938 CC) , 2333 Porthan (1943 EP) , 21561 Masterman (1998 QR93) , 3515 Jindra (1982 UH2) , 32267 Hermannweyl (2000 PS1) , 2582 Harimaya-Bashi (1981 SA) , 22933 Mareverett (1999 TZ141) , 8120 Kobe (1997 VT) , 23019 Thomgregory (1999 VQ201) , 5027 Androgeos (1988 BX1) , 1428 Mombasa (1937 NO) , 4771 Hayashi (1989 RM2) , 26276 Natrees (1998 SL4) , 6904 McGill (1990 QW1) , 3378 Susanvictoria (A922 WB) , 6902 Hideoasada (1989 US3) , 7632 Stanislav (1982 UT5) , 2022 West (1938 CK) , 18699 Quigley (1998 HL45) , 1932 Jansky (1971 UB1) , 3887 Gerstner (1985 QX) , 8817 Roytraver (1985 JU1) , 16269 Merkord (2000 JP44) , 1225 Ariane (1930 HK) , 10371 Gigli (1995 DU3) , 19612 Noordung (1999 OO) ,

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35618 Tartu (1998 HC149) , 7197 Pieroangela (1994 BH) , 17683 Kanagawa (1997 AR16) ,
14595 Peaker (1998 SW32) , 21357 Davidying (1997 FJ4) , 15898 Kharasterteam (1997 QP) ,
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4491 Otaru (1988 RP) , 17185 Mcdavid (1999 VU23) , 5286 Haruomukai (1989 VT1) ,
24701 Elyu-Ene (1990 VY5) , 4773 Hayakawa (1989 WF) , 1564 Srbija (1936 TB) ,
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21718 Cheonghapark (1999 RO115) , 12863 Whitfield (1998 KE48) , 172 Baucis ,
5272 Dickinson (1981 QH2) , 43293 Banting (2000 GU1) , 715 Transvaalia (1911 LX) ,
20187 Janapittichova (1997 AN17) , 4980 Magomaev (1974 SP1) , 20496 Jenik (1999 QA2) ,
16221 Kevinyang (2000 DX48) , 4931 Tomsk (1983 CN3) , 9641 Demaziere (1994 PB30) ,
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6643 Morikubo (1990 VZ) , 2828 Iku-Turso (1942 DL) , 5211 Stevenson (1989 NX) ,
16459 Barth (1989 WE4) , 18668 Gottesman (1998 FU62) , 7233 Majella (1986 EQ5) ,
4425 Bilk (1967 UQ) , 24084 Teresaswiger (1999 TG289) , 3614 Tumilty (1983 AE1) ,
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17600 Dobrichovice (1995 SO) , 2701 Cherson (1978 RT) , 14621 Tati (1998 UF18) ,
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9156 Malanin (1982 TQ2) , 11098 Ginsberg (1995 GC2) , 1088 Mitaka (1927 WA) ,
4732 Froeschle (1981 JG) , 3128 Obruchev (1979 FJ2) , 723 Hammonia (1911 NB) ,
4344 Buxtehude (1988 CR1) , 6678 Seurat (3422 T-3) , 6041 Juterkilian (1990 KL) ,
3491 Fridolin (1984 SM4) , 2455 Somville (1950 TO4) , 11360 Formigine (1998 DL14) ,
1795 Woltjer (4010 P-L) , 6518 Vernon (1990 FR) , 7373 Stashis (1979 QX9) ,
16750 Marisandoz (1996 QL) , 5695 Remillieux (4577 P-L) , 11333 Forman (1996 HU) ,
12593 Shashlov (1999 RQ136) , 1535 Paijanne (1939 RC) , 20822 Lintingnien (2000 UK7) ,
17193 Alexeybaran (1999 XC205) , 8867 Tubbiolo (1992 BF4) , 6252 Montevideo (1992 EV11) ,
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10421 Dalmatin (1999 AY6) , 2620 Santana (1980 TN) , 3968 Koptelov (1978 TU5) ,
16267 Mcdermott (2000 JY43) , 1325 Inanda (1934 NR) , 134160 Pluis (2005 BE3) ,
21634 Huangweikang (1999 NB18) , 3372 Bratijchuk (1976 SP4) , 3086 Kalbaugh (1980 XE) ,
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75 Eurydike , 2155 Wodan (6542 P-L) , 6127 Hetherington (1989 HD) ,
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Normalize and then average the daily article count across all individual minor planets

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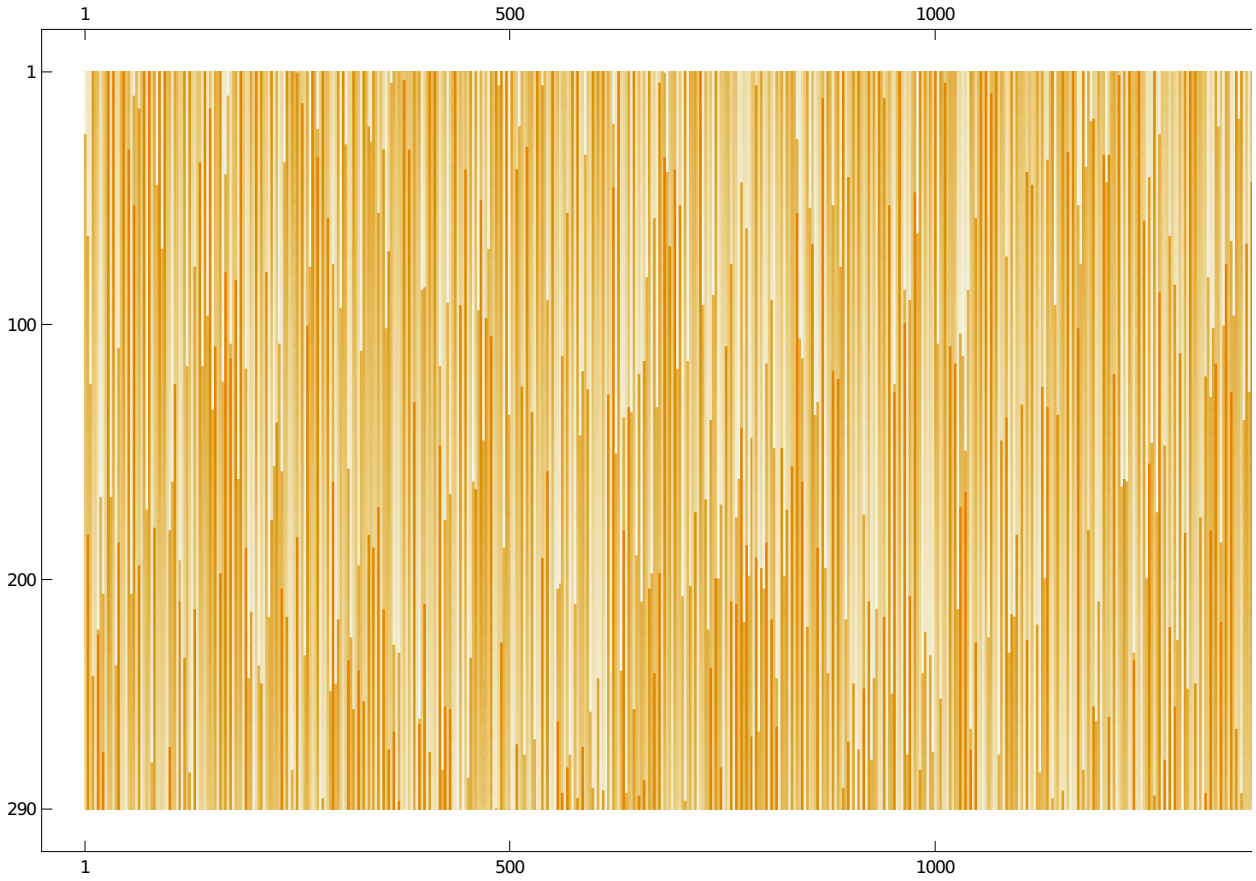
 71.14, 70.43, 69.72, 69.02, 68.32, 67.62, 66.93, 66.24, 65.55, 64.87, 64.18,
 63.5, 62.83, 62.15, 61.48, 60.82, 60.15, 59.49, 58.82, 58.17, 57.51, 56.86,
 56.21, 55.56, 54.91, 54.27, 53.62, 52.98, 52.35, 51.71, 51.08, 50.44, 49.81,
 49.19, 48.56, 47.94, 47.32, 46.69, 46.08, 45.46, 44.84, 44.23, 43.61, 43.,
 42.39, 41.78, 41.18, 40.57, 39.97, 39.36, 38.76, 38.16, 37.56, 36.97, 36.37,
 35.77, 35.18, 34.59, 34., 33.4, 32.81, 32.23, 31.64, 31.05, 30.47, 29.88, 29.3,
 28.71, 28.13, 27.55, 26.97, 26.39, 25.81, 25.23, 24.65, 24.07, 23.5, 22.92,
 22.34, 21.77, 21.19, 20.62, 20.05, 19.47, 18.9, 18.33, 17.75, 17.18, 16.61,
 16.04, 15.47, 14.9, 14.33, 13.76, 13.19, 12.62, 12.05, 11.49, 10.92, 10.35,
 9.78, 9.21, 8.64, 8.08, 7.51, 6.94, 6.37, 5.8, 5.23, 4.66, 4.1, 3.53, 2.96, 2.39,
 1.82, 1.25, 0.68, 0.11, 359.54, 358.98, 358.41, 357.84, 357.27, 356.7, 356.12,
 355.55, 354.98, 354.41, 353.84, 353.26, 352.69, 352.12, 351.54, 350.97, 350.39,
 349.82, 349.24, 348.67, 348.09, 347.51, 346.93, 346.35, 345.77, 345.19, 344.61,
 344.03, 343.45, 342.87, 342.29, 341.7, 341.12, 340.53, 339.95, 339.36, 338.78,
 338.19, 337.6, 337.01, 336.42, 335.83, 335.24, 334.64, 334.05, 333.45, 332.86,
 332.26, 331.66, 331.06, 330.46, 329.86, 329.26, 328.66, 328.05, 327.45, 326.84,
 326.24, 325.63, 325.02, 324.41, 323.8, 323.16, 322.55, 321.93, 321.32, 320.7,
 320.08, 319.46, 318.84, 318.22, 317.59, 316.97, 316.34, 315.71, 315.08, 314.45,
 313.82, 313.19, 312.55, 311.92, 311.28, 310.64, 310., 309.35, 308.71, 308.06}
```

In[•]:=
```
MatrixPlot[toanalyse]
```

Out[•]=



In[•]:=
```
articles = Table[toanalyse[[All, i]], {i, 1, Length[toanalyse[[1]]], 2}];
```

In[•]:=
```
anglesrads =
  Table[UnitConvert[Quantity[toanalyse[[All, i]], "AngularDegrees"], "Radians"],
   {i, 2, Length[toanalyse[[1]]], 2}];
```

In[•]:=
```
Length[articles[[1]]]
```

Out[•]=
```
290
```

In[•]:=
```
Length[anglesrads[[1]]]
```

Out[•]=
```
290
```

For Each Minor Planet Studied, Construct Time Series for the Normalized Article Counts

In[•]:=
```
articlesTS = Table[TimeSeries[articles[[i]], {dates}], {i, 1, Length[articles]}];
```

In[•]:=
```
normarticlesTS = Table[Normalize[articlesTS[[i]]], {i, 1, Length[articlesTS]}];
```

Look at an Example, the Second One, for a Time Series of the Number of Articles

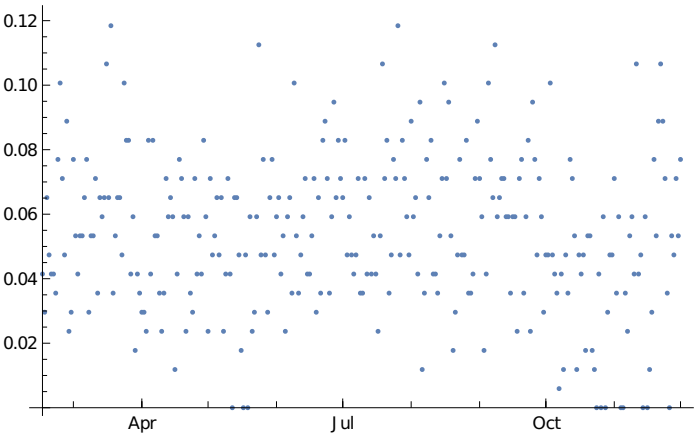
Per Day

In[•]:=
```
normarticlesTS[[2]]
```

Out[•]=
```
TimeSeries[ ⊞ Time: 15 Feb 2022 to 01 Dec 2022
            Data points: 290 ]
```

In[•]:=
```
ListPlot[%]
```

Out[•]=



In[•]:=
```
Mod[0, 360]
```

Out[•]=
```
0
```

Similarly, Construct a Time Series for the Rounded Angular Degrees to the Sun for Each Minor Planet

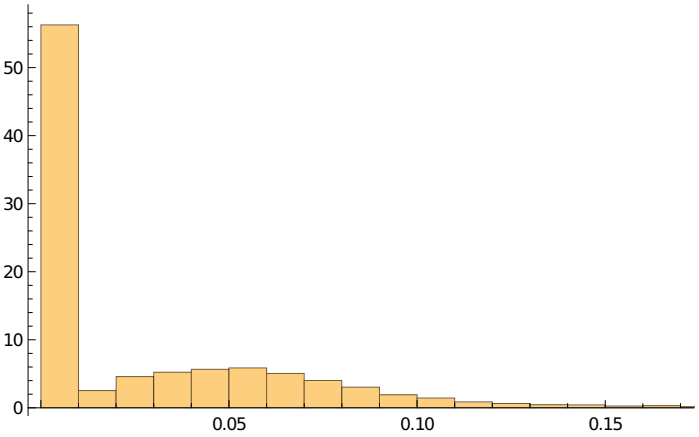
In[•]:=
```
anglesTS = Table[TimeSeries[UnitConvert[anglesrads[[i]], "AngularDegrees"], {dates}],
    {i, 1, Length[anglesrads]}];
```

In[•]:=
```
justangles = Flatten[Table[
     Mod[Round[QuantityMagnitude[Values[anglesTS[[i]]]], 360], {i, 1, Length[anglesTS]}]];
```

In[•]:=
```
justvalues = Flatten[Table[Values[normarticlesTS[[i]], {i, Length[normarticlesTS]}]];
```

In[•]:=
```
Histogram[justvalues, Automatic, "ProbabilityDensity"]
```

Out[•]=



Now, combine angles and article counts.

In[•]:=
```
just = Transpose[{justangles, justvalues}];
```

In[•]:=
```
Length[just](*this is the number of data points to date*)
```

Out[•]=
```
351 190
```

Do some basic descriptive statistics. Some will be used for calculating sampling errors.

In[•]:=
```
Length[dates] * Length[articles](*confirmation of number of data points!*)
```

Out[•]=
```
351 190
```

In[•]:=
```
tsNA4Lengths = KeySort[GroupBy[just, First → Last, Length]];
```

In[•]:=
```
tsNA4SD = KeySort[GroupBy[just, First → Last, StandardDeviation]];
```

In[•]:=
```
samplingerrors = 1.95 * N[Values[tsNA4SD]] / Values[tsNA4Lengths];
```

In[•]:=
```
Mean[samplingerrors]
```

Out[•]=
```
0.000102675
```

In[•]:=
```
N[Mean[justvalues]]
```

Out[•]=
```
0.0289967
```

In[•]:=
```
Mean[samplingerrors] / N[Mean[justvalues]]
```

Out[•]=
```
0.00354092
```

Calculate the average normalized article count per rounded degree.

In[•]:=
```
valgrpbydeg = KeySort[GroupBy[N[just], First → Last, Mean]]
```

Out[•]=
```
<|0. → 0.0284361, 1. → 0.0290893, 2. → 0.0284982, 3. → 0.0293737, 4. → 0.028419,
 5. → 0.0297311, 6. → 0.0278757, 7. → 0.0306673, 8. → 0.0308112, 9. → 0.0276028,
```

10. → 0.0269094, 11. → 0.0308375, 12. → 0.0321638, 13. → 0.0297927, 14. → 0.0288552,
15. → 0.027427, 16. → 0.0283326, 17. → 0.0281379, 18. → 0.0302212, 19. → 0.029665,
20. → 0.0293942, 21. → 0.0279263, 22. → 0.0310809, 23. → 0.0300927, 24. → 0.0272368,
25. → 0.0296532, 26. → 0.0294515, 27. → 0.0286947, 28. → 0.0313297, 29. → 0.0292557,
30. → 0.0306916, 31. → 0.0307711, 32. → 0.0292105, 33. → 0.028044, 34. → 0.0312456,
35. → 0.0287522, 36. → 0.0280377, 37. → 0.0310129, 38. → 0.0284394, 39. → 0.0298188,
40. → 0.0306607, 41. → 0.0289329, 42. → 0.0303357, 43. → 0.0314249, 44. → 0.0303757,
45. → 0.0290256, 46. → 0.028603, 47. → 0.0298134, 48. → 0.0296852, 49. → 0.0294014,
50. → 0.0317037, 51. → 0.029522, 52. → 0.0289287, 53. → 0.0297509, 54. → 0.0305606,
55. → 0.0304917, 56. → 0.0304189, 57. → 0.0296792, 58. → 0.0303074, 59. → 0.0296908,
60. → 0.0283368, 61. → 0.0294147, 62. → 0.0287021, 63. → 0.0295248, 64. → 0.0274711,
65. → 0.0287618, 66. → 0.0291229, 67. → 0.0288768, 68. → 0.028245, 69. → 0.0320116,
70. → 0.031512, 71. → 0.0321461, 72. → 0.029459, 73. → 0.0294999, 74. → 0.031489,
75. → 0.0298521, 76. → 0.0326921, 77. → 0.028714, 78. → 0.031653, 79. → 0.0282272,
80. → 0.0306484, 81. → 0.0306817, 82. → 0.032144, 83. → 0.0328643, 84. → 0.0286152,
85. → 0.0299095, 86. → 0.02865, 87. → 0.0308226, 88. → 0.0295827, 89. → 0.0302089,
90. → 0.0279134, 91. → 0.0310025, 92. → 0.0307556, 93. → 0.0286746, 94. → 0.0294689,
95. → 0.0308359, 96. → 0.0307293, 97. → 0.0299506, 98. → 0.0300688, 99. → 0.0296063,
100. → 0.0274996, 101. → 0.0284756, 102. → 0.0270589, 103. → 0.0330454,
104. → 0.030539, 105. → 0.0311115, 106. → 0.029443, 107. → 0.0280583,
108. → 0.0267966, 109. → 0.0314749, 110. → 0.0299161, 111. → 0.0282708,
112. → 0.0288016, 113. → 0.0295221, 114. → 0.0287761, 115. → 0.0274223,
116. → 0.0312549, 117. → 0.0319803, 118. → 0.0300784, 119. → 0.0292927,
120. → 0.0294041, 121. → 0.0292671, 122. → 0.0288477, 123. → 0.0292154,
124. → 0.0288835, 125. → 0.0314527, 126. → 0.0334092, 127. → 0.0269377,
128. → 0.0274382, 129. → 0.0269577, 130. → 0.0288843, 131. → 0.0292987,
132. → 0.0295127, 133. → 0.0308645, 134. → 0.0269208, 135. → 0.0268655,
136. → 0.0270826, 137. → 0.031325, 138. → 0.030364, 139. → 0.0283301,
140. → 0.0318948, 141. → 0.0304712, 142. → 0.0300741, 143. → 0.0314799,
144. → 0.0300229, 145. → 0.0299988, 146. → 0.0300871, 147. → 0.0298355,
148. → 0.0292753, 149. → 0.0283649, 150. → 0.026969, 151. → 0.0264639,
152. → 0.0293044, 153. → 0.0320098, 154. → 0.0286707, 155. → 0.02791,
156. → 0.0299448, 157. → 0.0280975, 158. → 0.0262646, 159. → 0.0291987,
160. → 0.0292362, 161. → 0.0279413, 162. → 0.0293459, 163. → 0.0311227,
164. → 0.0319408, 165. → 0.0269473, 166. → 0.0272084, 167. → 0.0268916,
168. → 0.0319791, 169. → 0.0304849, 170. → 0.0316307, 171. → 0.0279149,
172. → 0.0290444, 173. → 0.0272187, 174. → 0.0284902, 175. → 0.0296621,
176. → 0.0298022, 177. → 0.0259906, 178. → 0.0304092, 179. → 0.0285847,
180. → 0.0289238, 181. → 0.0274401, 182. → 0.0266201, 183. → 0.0284474,
184. → 0.0251996, 185. → 0.0260894, 186. → 0.0264054, 187. → 0.0280166,
188. → 0.0263082, 189. → 0.0280608, 190. → 0.0282637, 191. → 0.028721,
192. → 0.0267842, 193. → 0.0284708, 194. → 0.0282039, 195. → 0.0310513,
196. → 0.0306831, 197. → 0.0256274, 198. → 0.0299744, 199. → 0.0302392,

```
200. → 0.028411, 201. → 0.0268921, 202. → 0.0282876, 203. → 0.0272309,
204. → 0.0295187, 205. → 0.0284311, 206. → 0.0292189, 207. → 0.030888,
208. → 0.0295172, 209. → 0.0283526, 210. → 0.029131, 211. → 0.0271801,
212. → 0.0272456, 213. → 0.0268709, 214. → 0.0241725, 215. → 0.0288412,
216. → 0.0308484, 217. → 0.0272023, 218. → 0.0309978, 219. → 0.0258413,
220. → 0.0265129, 221. → 0.025288, 222. → 0.0284406, 223. → 0.030887,
224. → 0.0285126, 225. → 0.030241, 226. → 0.0305301, 227. → 0.0277015,
228. → 0.0283182, 229. → 0.0254561, 230. → 0.026178, 231. → 0.0289057,
232. → 0.0275169, 233. → 0.0265631, 234. → 0.0282146, 235. → 0.0281343,
236. → 0.0257354, 237. → 0.0257867, 238. → 0.0275971, 239. → 0.0305003,
240. → 0.0250887, 241. → 0.0286367, 242. → 0.0275837, 243. → 0.0299809,
244. → 0.0269191, 245. → 0.0271232, 246. → 0.0278081, 247. → 0.0250176,
248. → 0.0263104, 249. → 0.0281071, 250. → 0.0273854, 251. → 0.0271193,
252. → 0.0274228, 253. → 0.0270848, 254. → 0.028575, 255. → 0.0261792,
256. → 0.0289222, 257. → 0.0286117, 258. → 0.0299716, 259. → 0.0265347,
260. → 0.0257538, 261. → 0.0293858, 262. → 0.0278307, 263. → 0.0287447,
264. → 0.02518, 265. → 0.0287814, 266. → 0.0275533, 267. → 0.0271049,
268. → 0.0260446, 269. → 0.0312786, 270. → 0.0289664, 271. → 0.0289098,
272. → 0.0286249, 273. → 0.0284162, 274. → 0.028047, 275. → 0.0298645,
276. → 0.0305565, 277. → 0.0290134, 278. → 0.0257437, 279. → 0.0283821,
280. → 0.0285765, 281. → 0.0270962, 282. → 0.0270562, 283. → 0.030112,
284. → 0.0307197, 285. → 0.0281179, 286. → 0.0280355, 287. → 0.0284853,
288. → 0.0297356, 289. → 0.0272311, 290. → 0.0292573, 291. → 0.0298684,
292. → 0.0282791, 293. → 0.0298311, 294. → 0.030991, 295. → 0.0263123,
296. → 0.0301516, 297. → 0.0270942, 298. → 0.0260118, 299. → 0.0269904,
300. → 0.0272282, 301. → 0.0312433, 302. → 0.0302584, 303. → 0.0277386,
304. → 0.0306288, 305. → 0.0316165, 306. → 0.030213, 307. → 0.0285528,
308. → 0.0275391, 309. → 0.0298418, 310. → 0.0297673, 311. → 0.0296744,
312. → 0.0261693, 313. → 0.0291788, 314. → 0.0286164, 315. → 0.0295502,
316. → 0.0310366, 317. → 0.0279183, 318. → 0.0297483, 319. → 0.0275803,
320. → 0.0275507, 321. → 0.0296945, 322. → 0.0291077, 323. → 0.0285463,
324. → 0.0278181, 325. → 0.0266653, 326. → 0.0269128, 327. → 0.0277101,
328. → 0.0284481, 329. → 0.0287905, 330. → 0.0285282, 331. → 0.0265334,
332. → 0.0276891, 333. → 0.0284252, 334. → 0.0294637, 335. → 0.0271685,
336. → 0.0268438, 337. → 0.0294862, 338. → 0.0287769, 339. → 0.0281955,
340. → 0.0305408, 341. → 0.0292695, 342. → 0.0287522, 343. → 0.0282718,
344. → 0.0277104, 345. → 0.0294102, 346. → 0.0305477, 347. → 0.0280443,
348. → 0.0272991, 349. → 0.0287844, 350. → 0.0301981, 351. → 0.0297668,
352. → 0.028636, 353. → 0.0297227, 354. → 0.0295994, 355. → 0.0305125,
356. → 0.0316617, 357. → 0.0309546, 358. → 0.0291947, 359. → 0.0291727|>
```

In[•]:=
```
data = Values[valgrpbydeg];
```

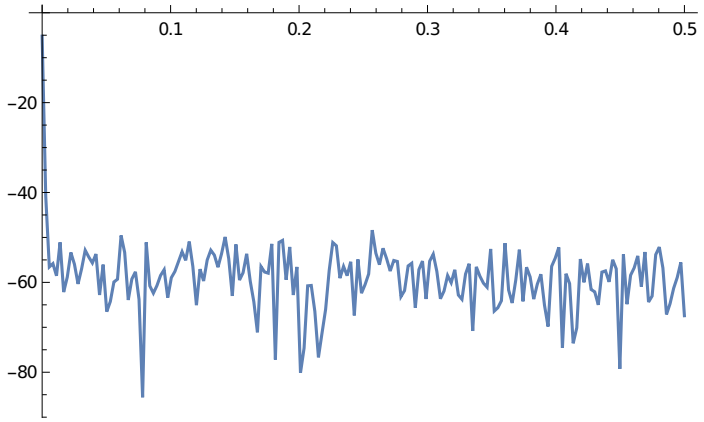
In[•]:=
```
sd = StandardDeviation[data]
```

Out[•]=
```
0.0016409
```

A periodogram is useful for seeing periodicities in the data.

In[•]:=
```
Periodogram[data, PlotRange → All]
```

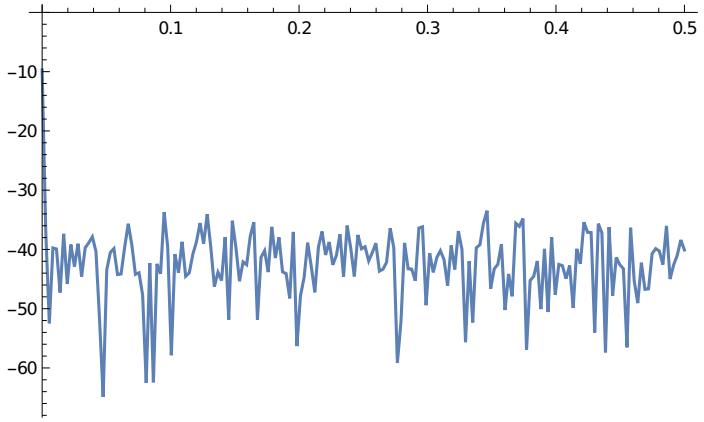
Out[•]=



Compare to a random simulation to see some idea of unusual behavior.

In[•]:=
```
Periodogram[RandomReal[Max[data], 360], PlotRange → All]
```

Out[•]=



There is a peak at 2 and 3. Let’s get more particular about pulling out one Fourier Transform peak at 30. It corresponds to a frequency of ~12, i.e. this may be same basis as for the astrology signs. Also, there is an even stronger signal at 93, corresponding to a frequency of ~4. This may be the basis for squares.

In[•]:=
```
Length[data]
```

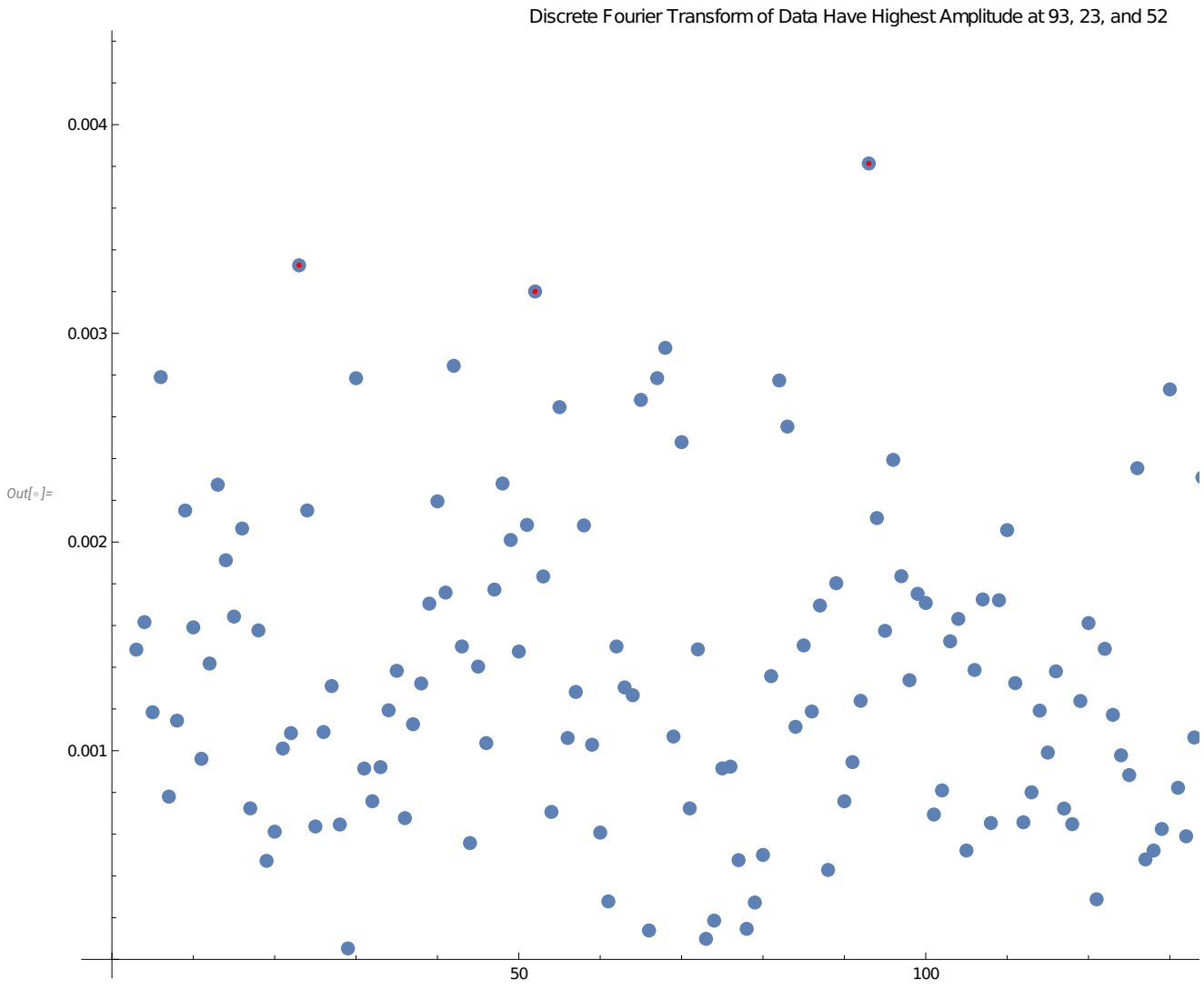
Out[•]=
```
360
```

In[•]:=
```
f = Abs[Fourier[data]];
peaksize = Last[TakeLargest[f, 8]];
peaks = Flatten[Position[f, x_ /; x ≥ peaksize]]
```

Out[•]= {1, 2, 23, 52, 93, 269, 310, 339, 360}

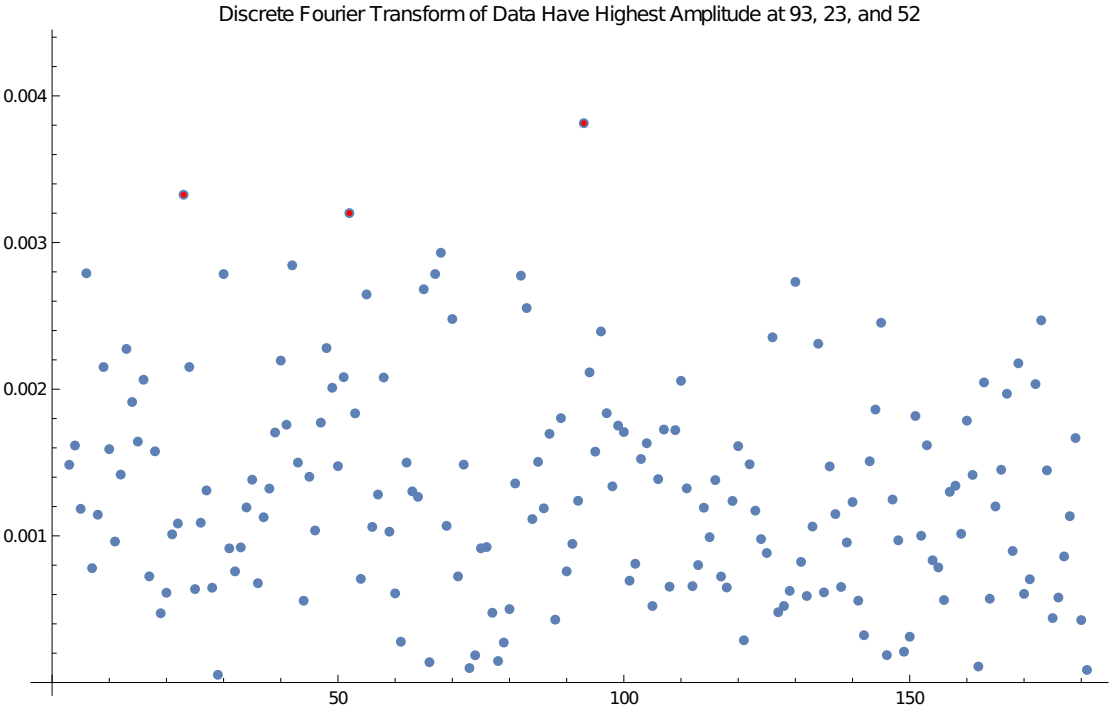
In[•]:=
```
Show[ListPlot[f[[1 ;; 181]],
  PlotLabel → "Discrete Fourier Transform of Data Have Highest
     Amplitude at 93, 23, and 52"],
 Graphics[{Red, Point[{93, f[[93]]}], Point[{23, f[[23]]}], Point[{52, f[[52]]}]}]]
```

Out[•]=



In[•]:=
```
Show[%, ImageSize → Large]
```

Out[•]=



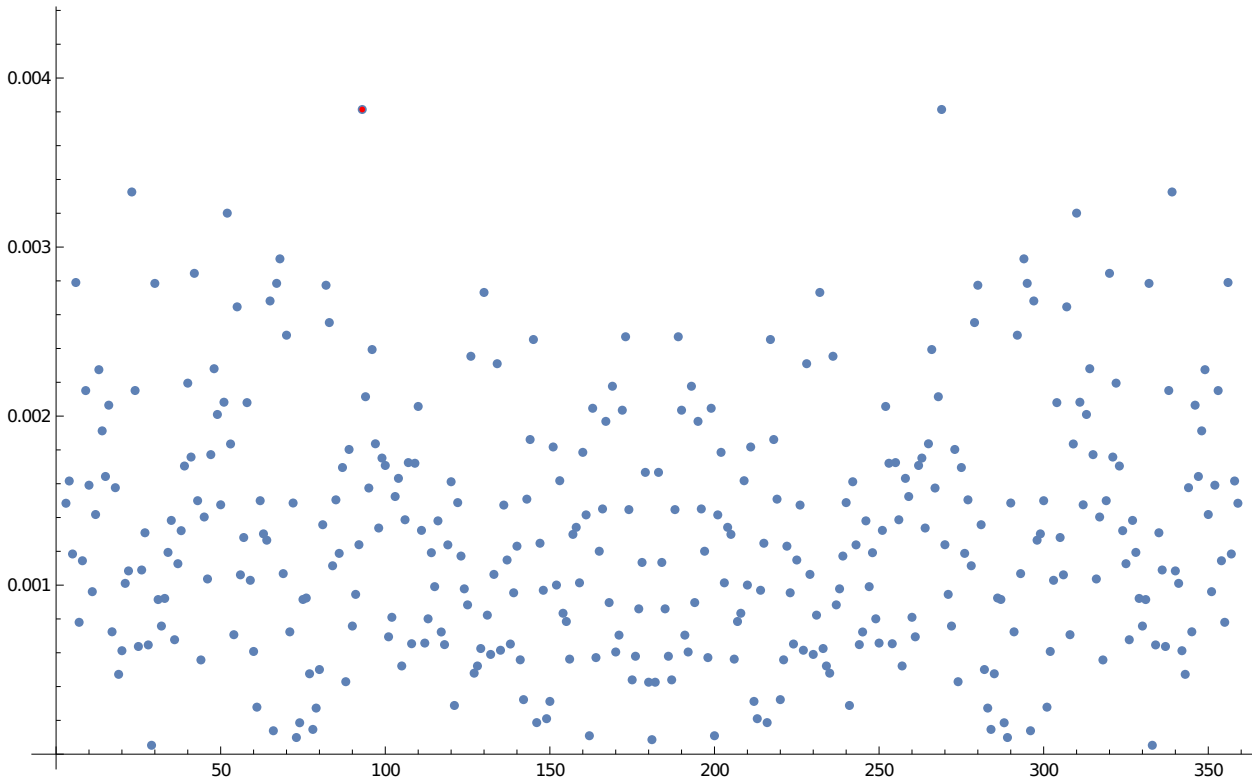
In[•]:=
```
pos1 = 93;
```

In[•]:=
```
pos1
```

Out[•]= 93

In[•]:=
```
Show[ListPlot[f(*,PlotRange→All*)], Graphics[{Red, Point[{pos1, f[[pos1]]}]}]]
```

Out[•]=



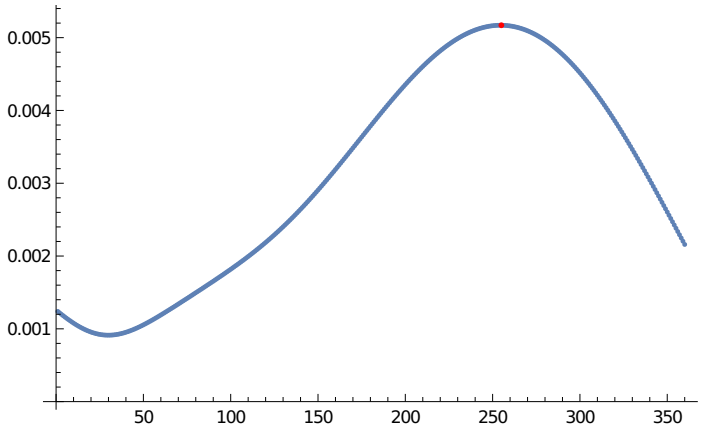
In[•]:=
```
n = 360;
```

In[•]:=
```
fr1 = Abs[Fourier[
      data * Exp[2 Pi I (pos1 - 2) N[Range[0, n - 1]] / n], FourierParameters → {0, 2 / n}]];
frpos1 = Position[fr1, Max[fr1]][[1, 1]]
```

Out[•]=
```
255
```

In[•]:=
```
Show[ListPlot[fr1], Graphics[{Red, Point[{frpos1, fr1[[frpos1]]}]}], PlotRange → All]
```

Out[•]=



In[•]:=
```
N[n / (pos1 - 2 + 2 (frpos1 - 1) / n)](*period*)
```
Out[•]= 3.89564

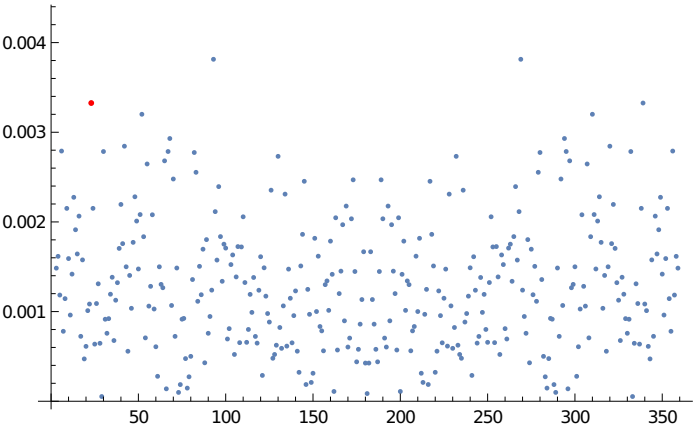
In[•]:=
```
f = Abs[Fourier[data]];
peaksize = Last[TakeLargest[f, 12]];
peaks = Flatten[Position[f, x_ /; x ≥ peaksize]]
```
Out[•]= {1, 2, 23, 42, 52, 68, 93, 269, 294, 310, 320, 339, 360}

In[•]:=

In[•]:=
```
pos2 = 23;
```

In[•]:=
```
pos2
```
Out[•]= 23

In[•]:=
```
Show[ListPlot[f], Graphics[{Red, Point[{pos2, f[[pos2]]}]}]]
```
Out[•]=

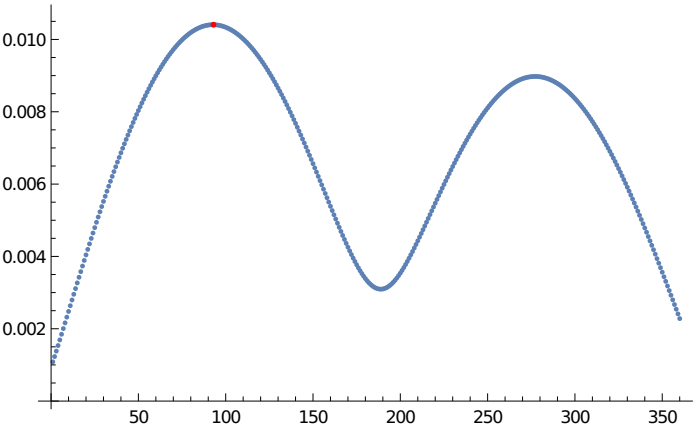


In[•]:=
```
n = 360;
```

In[•]:=
```
fr2 = Abs[Fourier[
      data * Exp[2 Pi I (pos2 - 2) N[Range[0, n - 1]] / n], FourierParameters → {0, 2 / n}]];
frpos2 = Position[fr2, Max[fr2]][[1, 1]]
```
Out[•]= 93

In[•]:=
```
Show[ListPlot[fr2], Graphics[{Red, Point[{frpos2, fr2[[frpos2]]}]}], PlotRange → All]
```

Out[•]=



In[•]:=
```
N[n / (pos2 - 2 + 2 (frpos2 - 1) / n)](*period*)
```

Out[•]=
```
16.7355
```

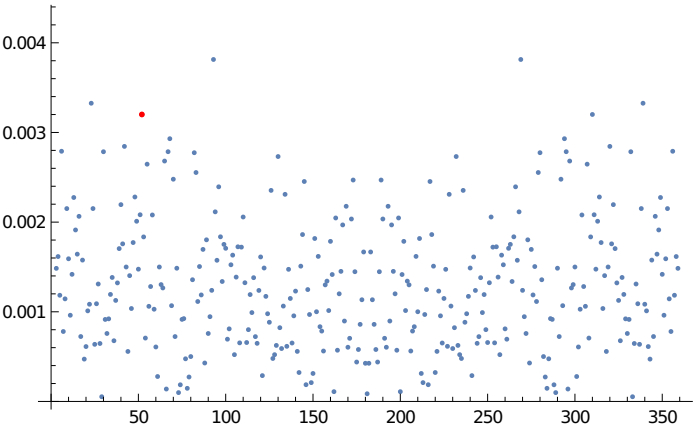
In[•]:=
```
pos3 = 52;
```

In[•]:=
```
pos3
```

Out[•]=
```
52
```

In[•]:=
```
Show[ListPlot[f], Graphics[{Red, Point[{pos3, f[[pos3]]}]}]]
```

Out[•]=



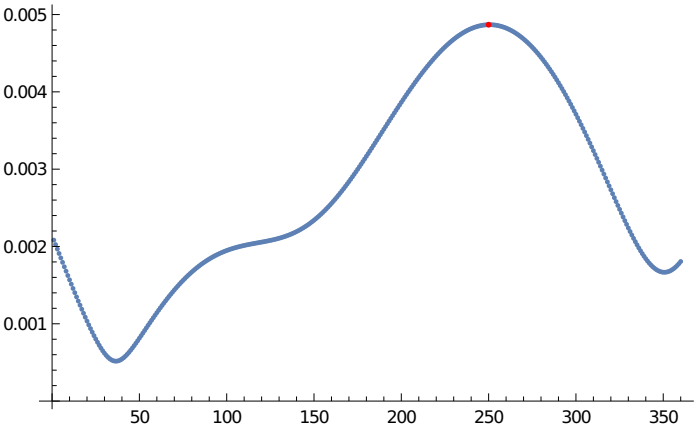
In[•]:=
```
n = 360;
```

In[•]:=
```
fr3 = Abs[Fourier[
      data * Exp[2 Pi I (pos3 - 2) N[Range[0, n - 1]] / n], FourierParameters → {0, 2 / n}]];
frpos3 = Position[fr3, Max[fr3]][[1, 1]]
```

Out[•]=
```
250
```

In[•]:=
```
Show[ListPlot[fr3], Graphics[{Red, Point[{frpos3, fr3[[frpos3]]}]}], PlotRange → All]
```

Out[•]=



In[•]:=
```
N[n / (pos3 - 2 + 2 (frpos3 - 1) / n)](*period*)
```

Out[•]= 7.00616

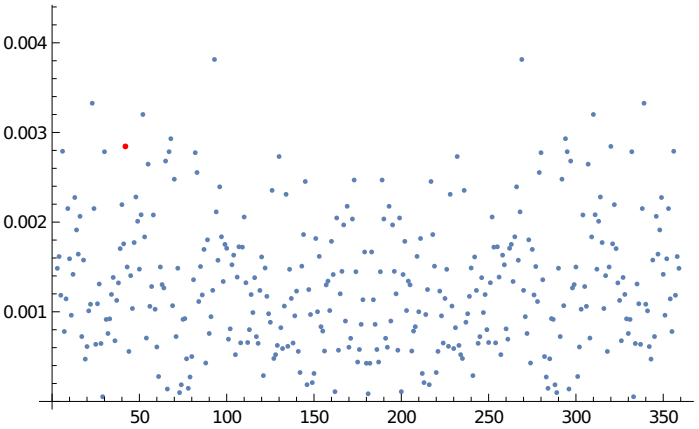
In[•]:=
```
pos4 = 42;
```

In[•]:=
```
pos4
```

Out[•]= 42

In[•]:=
```
Show[ListPlot[f], Graphics[{Red, Point[{pos4, f[[pos4]]}]}]]
```

Out[•]=



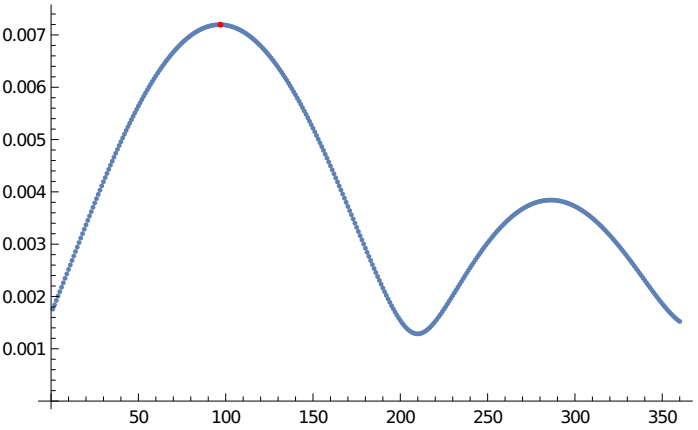
In[•]:=
```
n = 360;
```

In[•]:=
```
fr4 = Abs[Fourier[
      data * Exp[2 Pi I (pos4 - 2) N[Range[0, n - 1]] / n], FourierParameters → {0, 2 / n}]];
frpos4 = Position[fr4, Max[fr4]][[1, 1]]
```

Out[•]= 97

In[•]:=
```
Show[ListPlot[fr4], Graphics[{Red, Point[{frpos4, fr4[[frpos4]]}]}], PlotRange → All]
```

Out[•]=



In[•]:=
```
N[n / (pos4 - 2 + 2 (frpos4 - 1) / n)](*period*)
```

Out[•]=
```
8.88158
```

In[•]:=
```
{pos1, pos2, pos3, pos4}
```

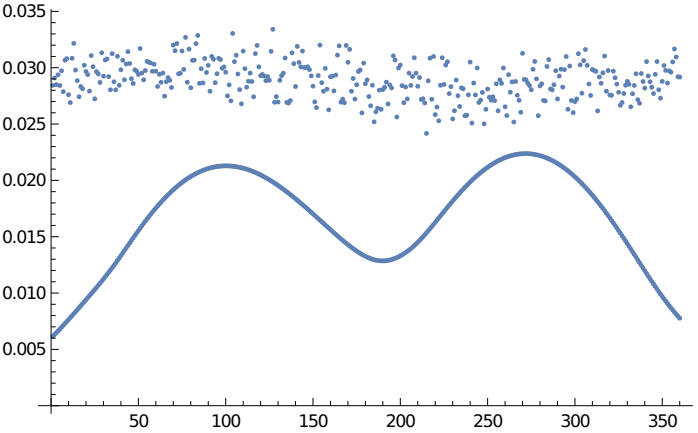
Out[•]=
```
{93, 23, 52, 42}
```

In[•]:=
```
{pos1, pos2, pos3, pos4}
```

Out[•]=
```
{93, 23, 52, 42}
```

In[•]:=
```
Show[ListPlot[fr1 + fr2 + fr3 + fr4], ListPlot[data](*,
  Graphics[{Red, Point[{frpos4, fr4[[frpos4]]}]}]*), PlotRange → All]
```

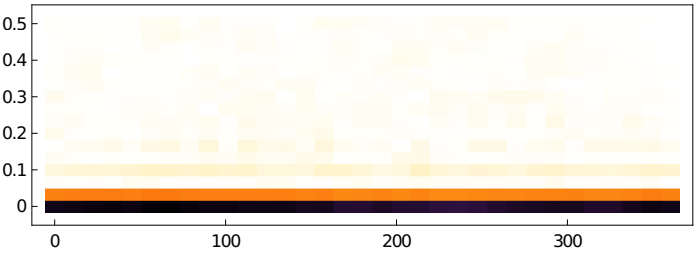
Out[•]=



A spectrogram visually confirms this frequency and period. A random data spectrogram follows for comparison.

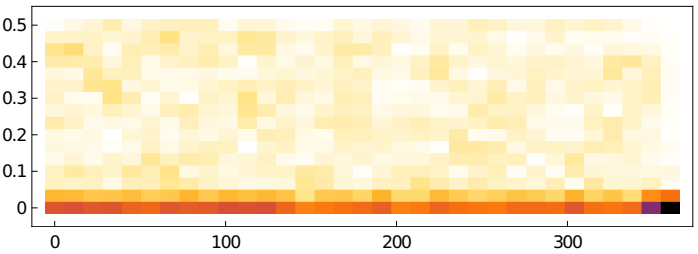
In[ ]:=
```
Spectrogram[data]
```

Out[ ]=



In[ ]:=
```
Spectrogram[RandomReal[Max[data], 360](*Length[just]*)]
```

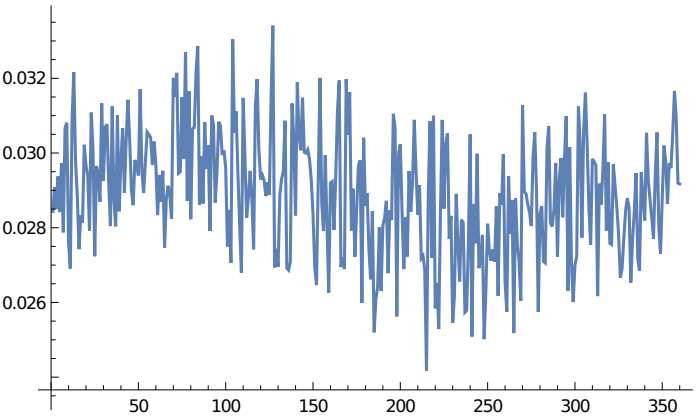
Out[ ]=



We can see more particularly the spikes directly in the Fourier transform of the data.

In[ ]:=
```
ListLinePlot[data, PlotRange → All]
```

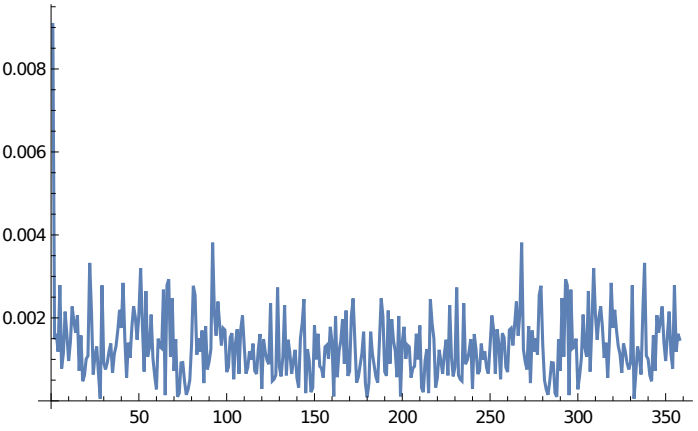
Out[ ]=



In[ ]:=

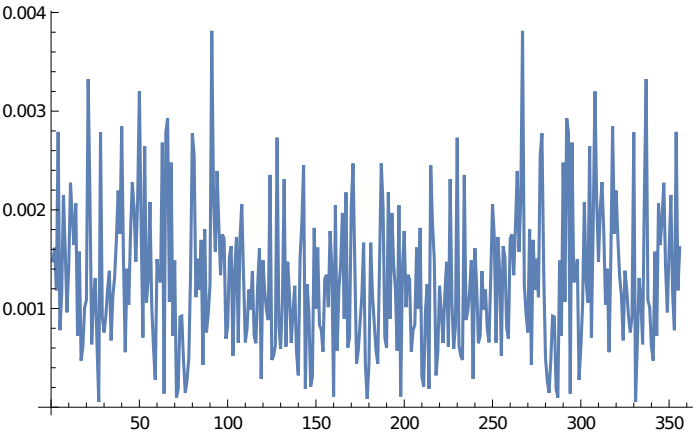
In[•]:=
```
ListLinePlot[(Abs[Fourier[data]])[[2 ;; -2]], PlotRange → All]
```

Out[•]=



In[•]:=
```
ListLinePlot[(Abs[Fourier[data]])[[3 ;; -3]], PlotRange → All]
```

Out[•]=



Going back to the data values, let's fit the results. They look like they fit well to a normal curve.

In[•]:=
```
FindDistribution[data, 3]
```

Out[•]=
```
{NormalDistribution[0.0289161, 0.00166978],
 NormalDistribution[0.0289161, 0.00166978], GammaDistribution[300.821, 0.0000962566]}
```

In[•]:=
```
dist = FindDistribution[data]
```

Out[•]=
```
NormalDistribution[0.0289161, 0.00166978]
```

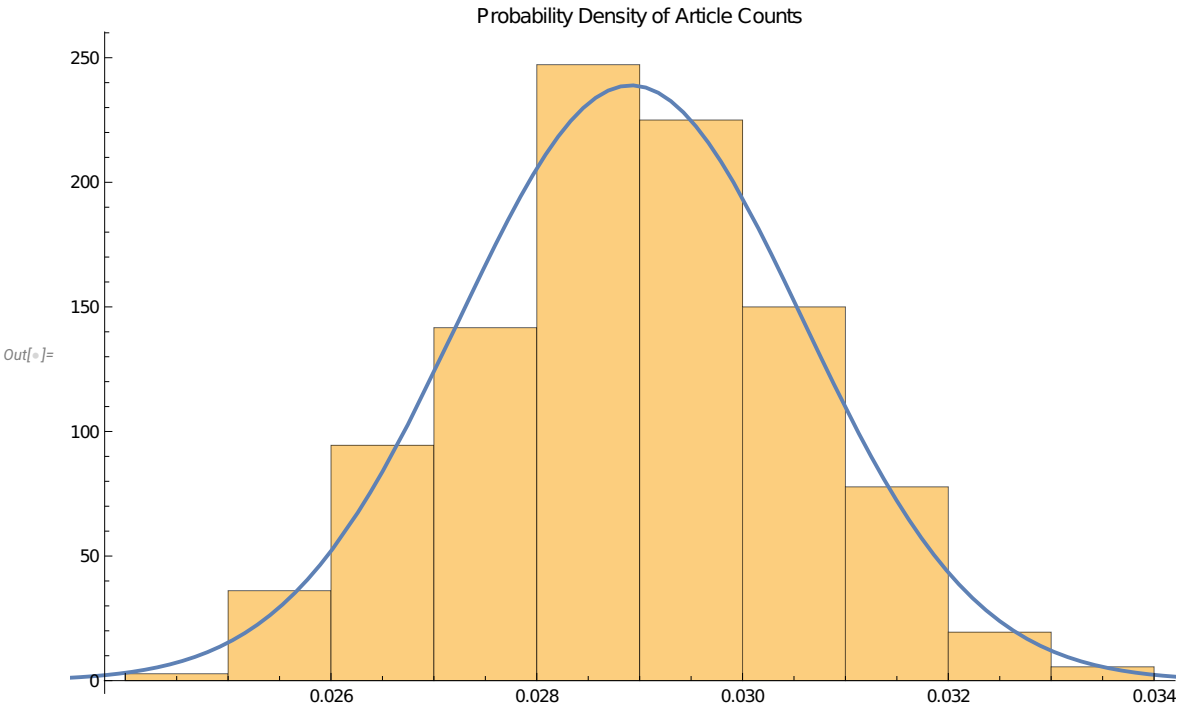
In[•]:=
```
ℋ = DistributionFitTest[data, dist, "HypothesisTestData"]; ℋ["TestDataTable", All]
```

Out[•]=

	Statistic	P-Value
Anderson-Darling	0.231796	0.979165
Baringhaus-Henze	0.129938	0.992943
Cramér-von Mises	0.0339171	0.961598
Jarque-Bera ALM	1.47197	0.455777
Kolmogorov-Smirnov	0.0275604	0.940283
Kuiper	0.0477874	0.849926
Mardia Combined	1.47197	0.455777
Mardia Kurtosis	−1.15808	0.246829
Mardia Skewness	0.221264	0.638078
Pearson χ^2	14.	0.869599
Shapiro-Wilk	0.997237	0.80798
Watson U^2	0.0325524	0.906155

In[•]:=
```
Show[Histogram[data, Automatic, "ProbabilityDensity"],
 Plot[PDF[dist, x], {x, 0, 0.4}, PlotStyle → Thick, PlotRange → All],
 PlotLabel → "Probability Density of Article Counts", ImageSize → Large]
```

Out[•]=



In[•]:=
```
FindDistribution[data]
```

Out[•]=
```
NormalDistribution[0.0289161, 0.00166978]
```

In[•]:=
```
d = DistributionFitTest[data, %, "TestDataTable"]
```

Out[•]=

	Statistic	P-Value
Cramér-von Mises	0.0339171	0.961598

In[•]:=
```
Max[data]
```

Out[•]=
```
0.0334092
```

In[•]:=
```
d = DistributionFitTest[data, UniformDistribution[{0, Max[data]}]]
```

Out[•]= 1.11022×10^{-15}

In[•]:=
```
DistributionFitTest[data, UniformDistribution[{0, Max[data]}], "TestDataTable"]
```

Out[•]=

	Statistic	P-Value
Cramér-von Mises	68.9468	1.11022×10^{-15}

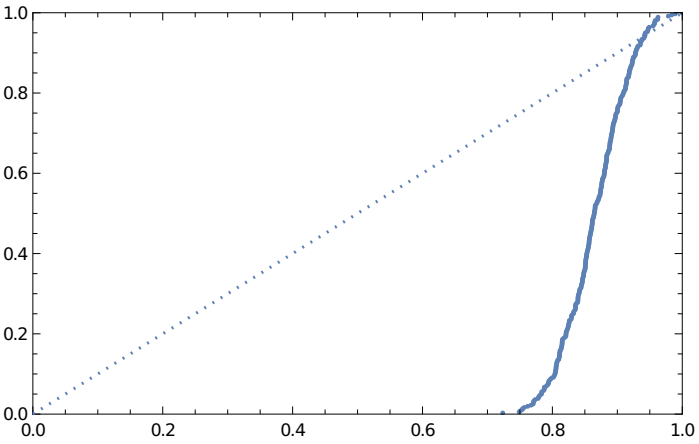
In[•]:=
```
$MinNumber
```

Out[•]= $6.229688249675322 \times 10^{-1\,355\,718\,576\,299\,610}$

The match to the normal curve is seen in a probability plot.

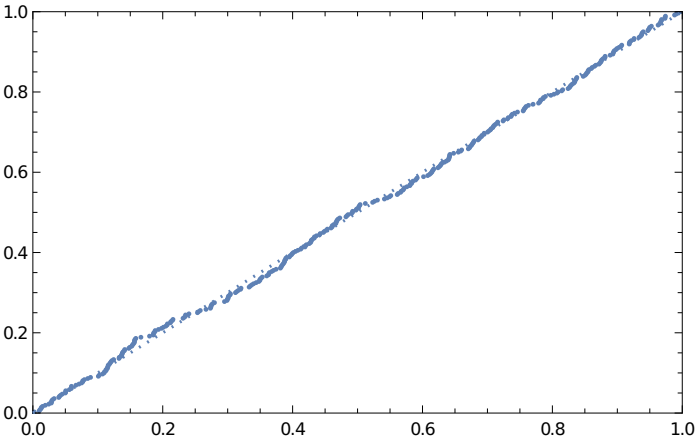
In[•]:=
```
ProbabilityPlot[data, UniformDistribution[{0, Max[data]}]]
```

Out[•]=



In[•]:=
```
ProbabilityPlot[data, dist]
```

Out[•]=



Let’s look closer at the sampling errors of the average normalized article counts. At most they are less than 1 percent of their corresponding values.

In[•]:=
```
errors = samplingerrors;
```

In[ ]:= **Mean[errors / data]**

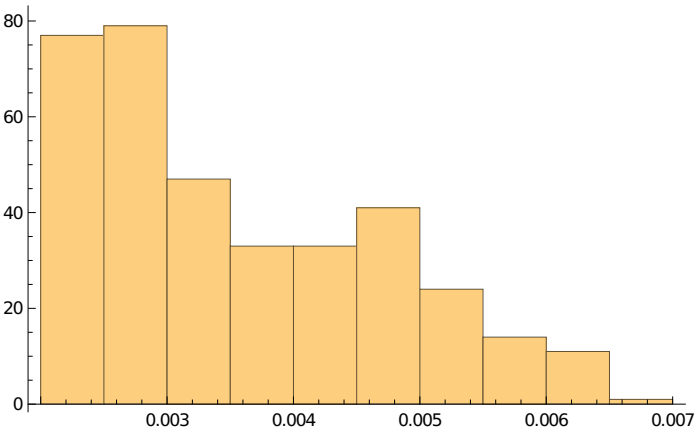
Out[ ]= 0.00355825

In[ ]:= **Max[errors / data]**

Out[ ]= 0.00660398

In[ ]:= **Histogram[errors / data]**

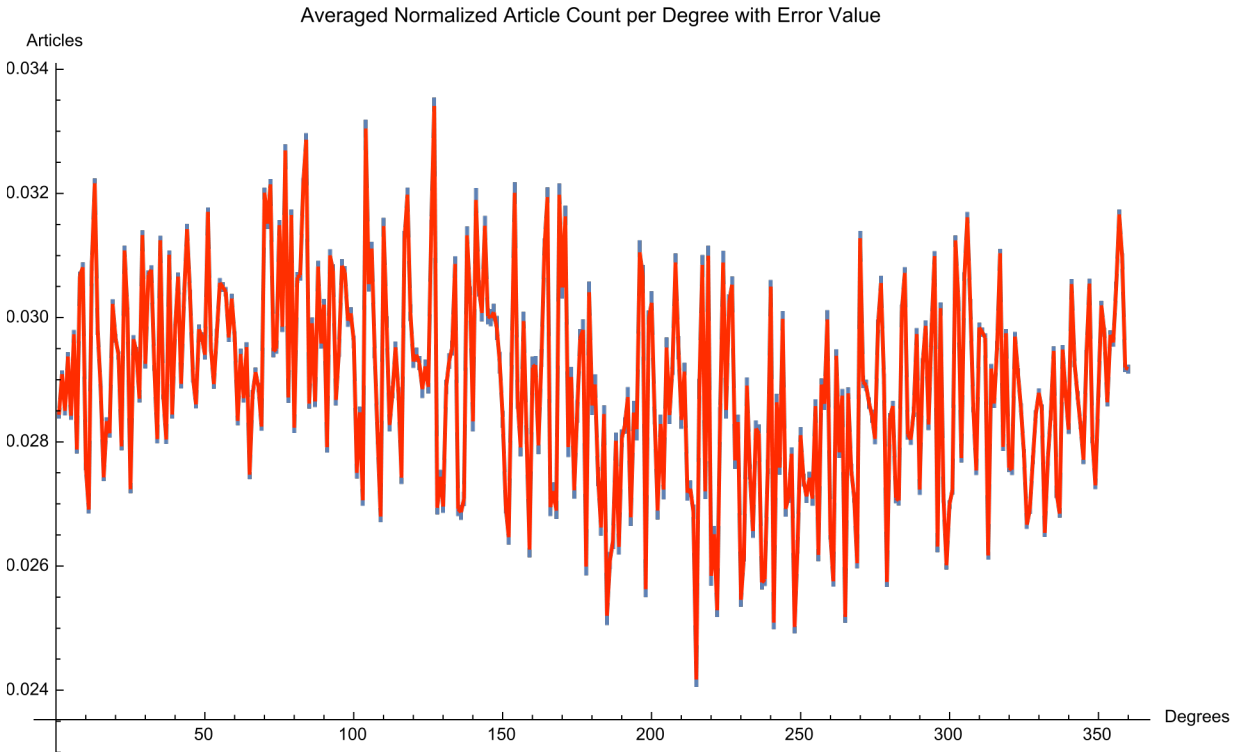
Out[ ]=



A plot of the values with error bars

In[•]:=
```
ListLinePlot[Table[Around[data[[i + 1]], errors[[i + 1]]], {i, 0, 359}],
 PlotRange → All, ColorFunction → Function[{x, y}, Hue[y]],
 PlotStyle → Thick, ColorFunctionScaling → False,
 PlotLabel → "Averaged Normalized Article Count per Degree with Error Value",
 AxesLabel → {"Degrees", "Articles"}]
```

Out[•]=



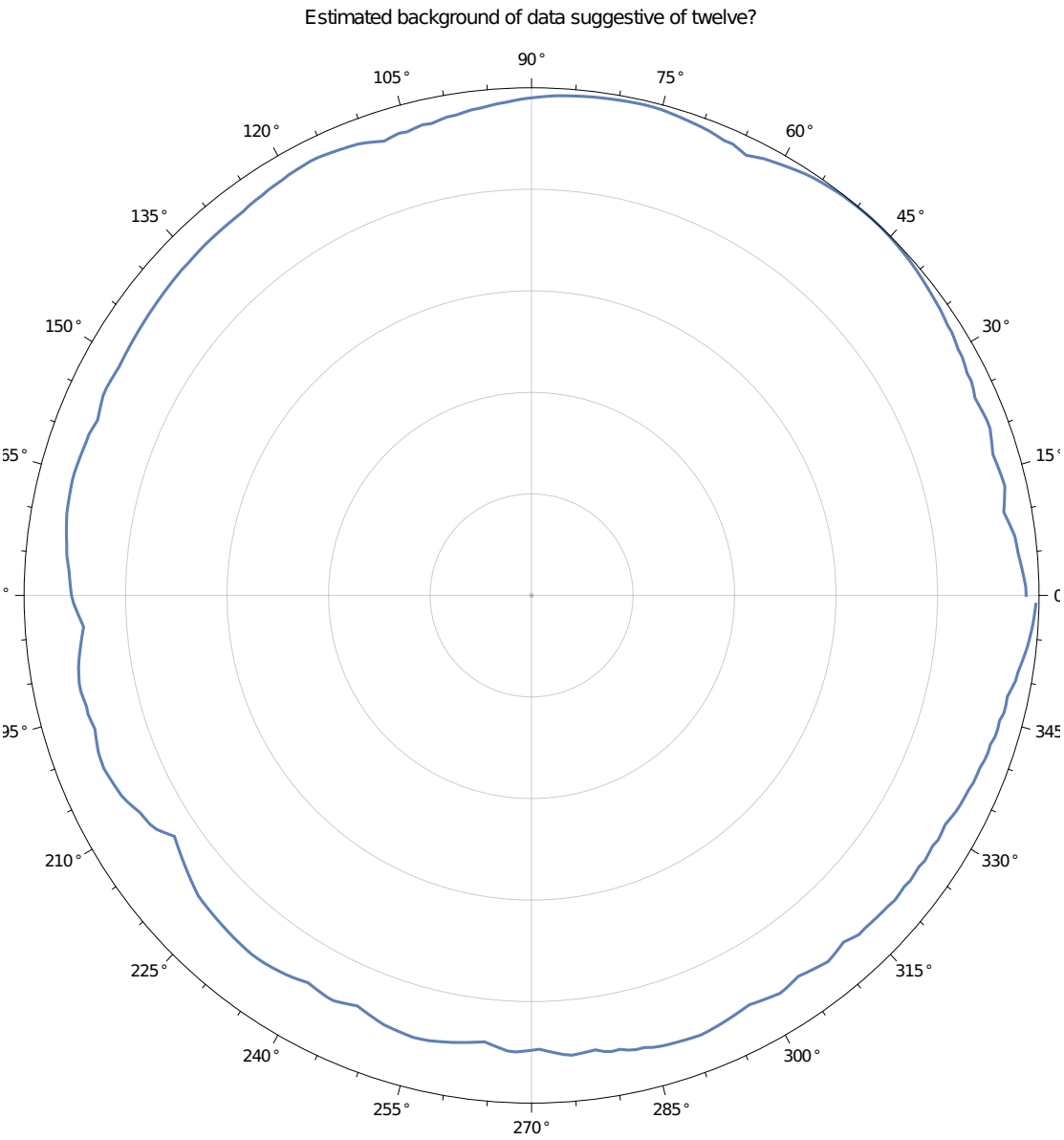
Let's look at the peaks and the base of the peaks.

In[•]:=
```
peaksB = FindPeaks[data, sd];
```

In[•]:=
```
base = EstimatedBackground[data];
```

In[ ]:=
```
ListPolarPlot[base,
 PlotLabel → "Estimated background of data suggestive of twelve?",
 PolarAxes → Automatic, PolarGridLines → {{0, Pi/2, Pi, 3 Pi/2}, Automatic},
 PolarTicks → {"Degrees", Automatic}(*,PlotLegends→{"True","False","Markers"}*),
 PlotRange → All, ImageSize → Large, Joined → True]
```

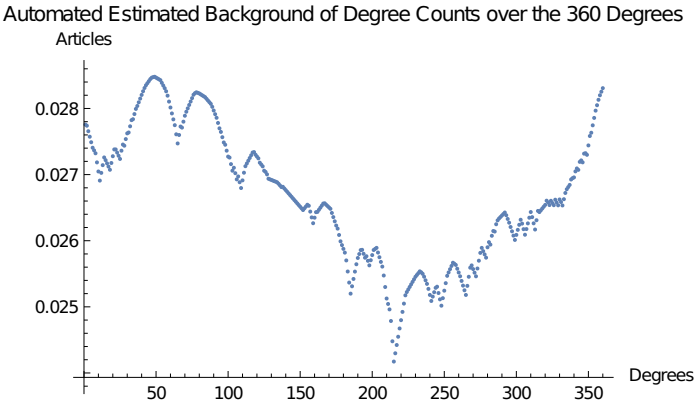
Out[ ]=



The base as a moving average with a window of 7 degrees may show 12 peaks, consistent with the Fourier transform peak above at 30 and perhaps substantiating the idea of (unequal) houses.

In[•]:=
```
ListPlot[base, PlotLabel →
  "Automated Estimated Background of Degree Counts over the 360 Degrees",
 AxesLabel → {"Degrees", "Articles"}]
```

Out[•]=

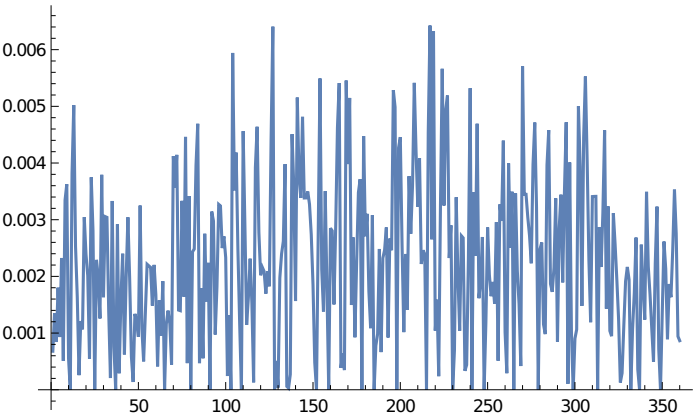



```
FindPeaks[base]
```

Out[•]=
```
{{1, 0.0277563}, {14, 0.0272593}, {22, 0.0273804}, {49, 0.0284794}, {78, 0.0282446},
 {118, 0.0273402}, {155, 0.0265441}, {167, 0.0265658}, {193, 0.0258622}, {203, 0.025892},
 {233, 0.0255366}, {245, 0.0253046}, {256, 0.0256671}, {269, 0.0256265},
 {276, 0.0258917}, {292, 0.0264265}, {303, 0.026317}, {310, 0.0264338},
 {321, 0.0266055}, {324, 0.0266036}, {327, 0.0266202}, {330, 0.026624}, {360, 0.0283071}}
```

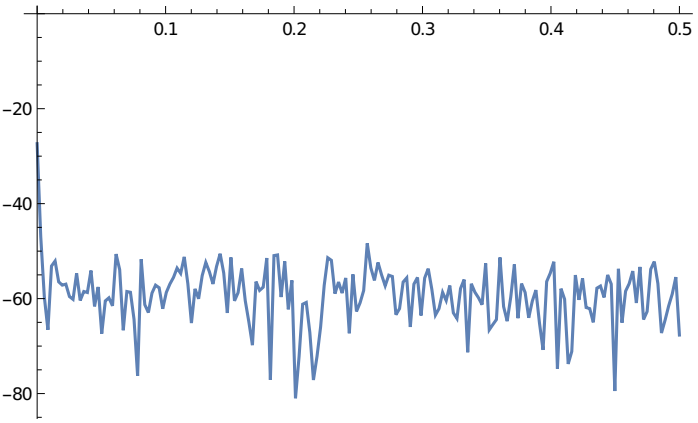
In[•]:=
```
ListLinePlot[data - base]
```

Out[•]=



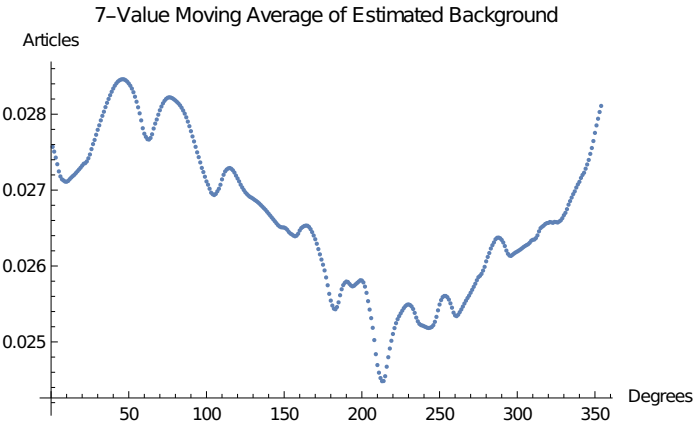
In[•]:=
```
Periodogram[data - base]
```

Out[•]=



In[•]:=
```
ListPlot[MovingAverage[base, 7],
 PlotLabel → "7-Value Moving Average of Estimated Background",
 AxesLabel → {"Degrees", "Articles"}]
```

Out[•]=

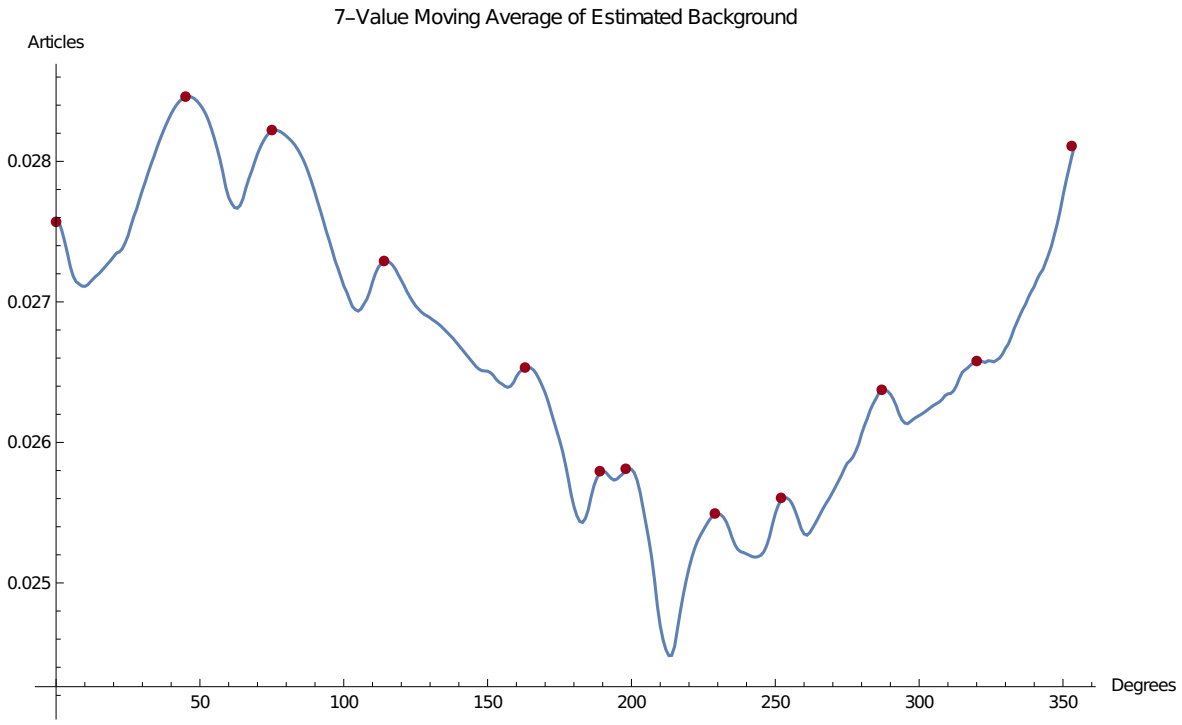


In[•]:=
```
backgroundpeaks = FindPeaks[MovingAverage[base, 7]]
```

Out[•]=
```
{{1, 0.0275694}, {46, 0.0284607}, {76, 0.0282227}, {115, 0.027291},
 {164, 0.0265328}, {190, 0.0257955}, {199, 0.0258124}, {230, 0.0254942},
 {253, 0.0256053}, {288, 0.0263744}, {321, 0.0265792}, {354, 0.0281092}}
```

In[•]:=
```
ListLinePlot[
 {MovingAverage[base, 7],
  Style[Transpose[{backgroundpeaks[[All, 1]] - 1, backgroundpeaks[[All, 2]]}], colors[[3]]]},
 Joined → {True, False},
 PlotStyle → {Automatic, PointSize[.01]},
 PlotLabel → "7-Value Moving Average of Estimated Background",
 AxesLabel → {"Degrees", "Articles"}]
```

Out[•]=



In[•]:=
```
backgroundpeaks = FindPeaks[MovingAverage[base, 7]]
```

Out[•]=
```
{{1, 0.0275694}, {46, 0.0284607}, {76, 0.0282227}, {115, 0.027291},
 {164, 0.0265328}, {190, 0.0257955}, {199, 0.0258124}, {230, 0.0254942},
 {253, 0.0256053}, {288, 0.0263744}, {321, 0.0265792}, {354, 0.0281092}}
```

In[•]:=
```
Length[FindPeaks[MovingAverage[base, 7]]]
```

Out[•]= 12

In[•]:=

In[•]:=
```
FindPeaks[MovingAverage[base, 7], StandardDeviation[MovingAverage[base, 7]]]
```

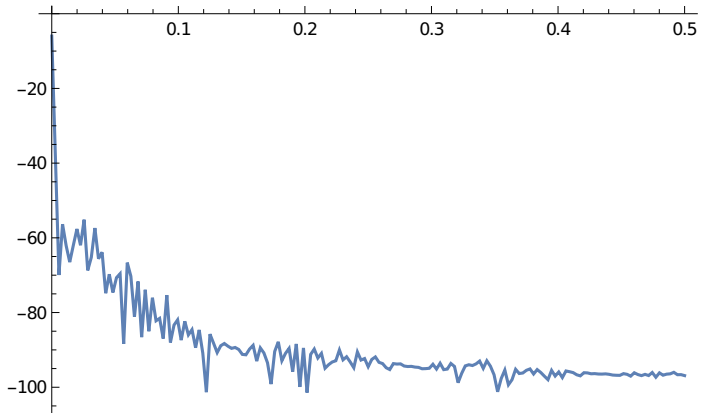
Out[•]=
```
{{1, 0.0275694}, {46, 0.0284607}, {76, 0.0282227}, {115, 0.027291}, {164, 0.0265328},
 {190, 0.0257955}, {199, 0.0258124}, {230, 0.0254942}, {253, 0.0256053},
 {288, 0.0263744}, {321, 0.0265792}, {324, 0.0265812}, {354, 0.0281092}}
```

In[•]:=
```
Length[%]
```

Out[•]= 13

In[•]:=
```
Periodogram[MovingAverage[base, 7], PlotRange → All]
```

Out[•]=



In[•]:=
```
peaksB[[All, 1]] - 1
```

Out[•]=
```
{3, 8, 12, 18, 22, 28, 31, 34, 37, 40, 43, 50, 54, 71, 76, 83, 87, 91, 95, 103,
 109, 113, 117, 126, 133, 137, 140, 143, 153, 164, 168, 170, 176, 178, 191, 195,
 199, 207, 216, 226, 231, 234, 239, 243, 249, 254, 258, 261, 265, 269, 276,
 280, 284, 288, 291, 294, 301, 305, 309, 316, 321, 329, 334, 340, 346, 350, 356}
```

In[•]:=
```
peaksB[[All, 1]] - 1
```

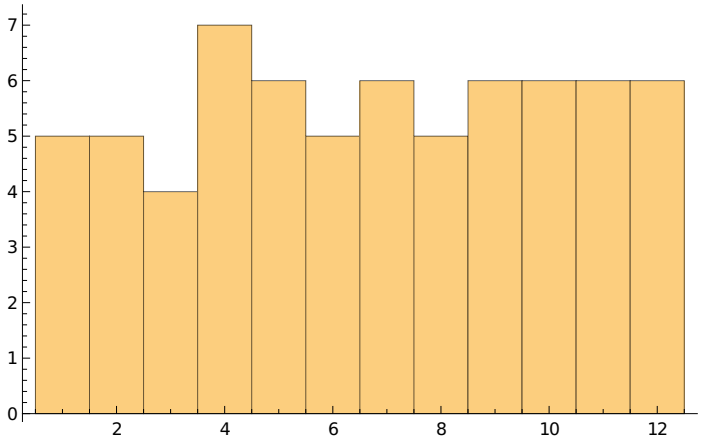
Out[•]=
```
{3, 8, 12, 18, 22, 28, 31, 34, 37, 40, 43, 50, 54, 71, 76, 83, 87, 91, 95, 103,
 109, 113, 117, 126, 133, 137, 140, 143, 153, 164, 168, 170, 176, 178, 191, 195,
 199, 207, 216, 226, 231, 234, 239, 243, 249, 254, 258, 261, 265, 269, 276,
 280, 284, 288, 291, 294, 301, 305, 309, 316, 321, 329, 334, 340, 346, 350, 356}
```

In[•]:=
```
h0 = Mod[peaksB[[All, 1]] - 1, 12] + 1
```

Out[•]=
```
{4, 9, 1, 7, 11, 5, 8, 11, 2, 5, 8, 3, 7, 12, 5, 12, 4, 8, 12, 8, 2,
 6, 10, 7, 2, 6, 9, 12, 10, 9, 1, 3, 9, 11, 12, 4, 8, 4, 1, 11, 4, 7, 12, 4,
 10, 3, 7, 10, 2, 6, 1, 5, 9, 1, 4, 7, 2, 6, 10, 5, 10, 6, 11, 5, 11, 3, 9}
```

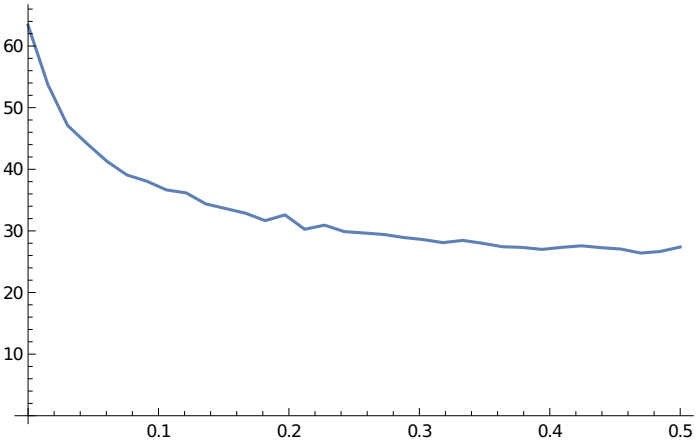
In[•]:=
```
Histogram[h0, 12]
```

Out[•]=



In[•]:=
```
Periodogram[peaksB[[All, 1]] - 1]
```

Out[•]=



In[•]:=
```
data
```

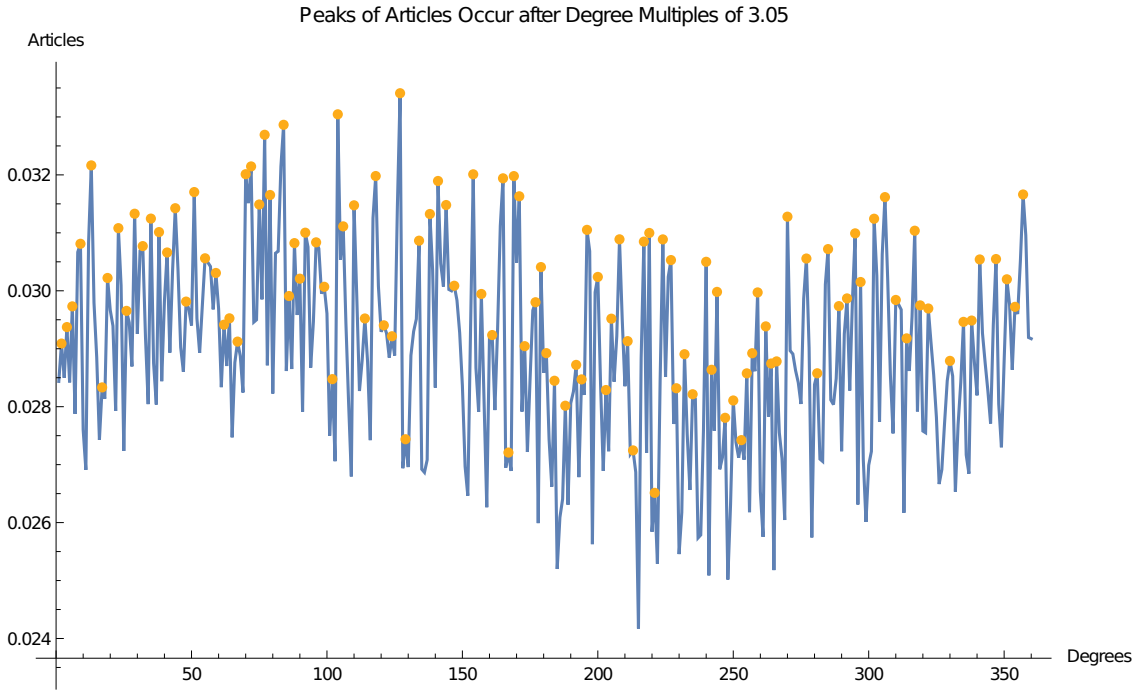
Out[•]=
```
{0.0284361, 0.0290893, 0.0284982, 0.0293737, 0.028419, 0.0297311, 0.0278757,
 0.0306673, 0.0308112, 0.0276028, 0.0269094, 0.0308375, 0.0321638, 0.0297927,
 0.0288552, 0.027427, 0.0283326, 0.0281379, 0.0302212, 0.029665, 0.0293942,
 0.0279263, 0.0310809, 0.0300927, 0.0272368, 0.0296532, 0.0294515, 0.0286947,
 0.0313297, 0.0292557, 0.0306916, 0.0307711, 0.0292105, 0.028044, 0.0312456,
 0.0287522, 0.0280377, 0.0310129, 0.0284394, 0.0298188, 0.0306607, 0.0289329,
 0.0303357, 0.0314249, 0.0303757, 0.0290256, 0.028603, 0.0298134, 0.0296852,
 0.0294014, 0.0317037, 0.029522, 0.0289287, 0.0297509, 0.0305606, 0.0304917,
 0.0304189, 0.0296792, 0.0303074, 0.0296908, 0.0283368, 0.0294147, 0.0287021,
 0.0295248, 0.0274711, 0.0287618, 0.0291229, 0.0288768, 0.028245, 0.0320116,
 0.031512, 0.0321461, 0.029459, 0.0294999, 0.031489, 0.0298521, 0.0326921, 0.028714,
 0.031653, 0.0282272, 0.0306484, 0.0306817, 0.032144, 0.0328643, 0.0286152,
 0.0299095, 0.02865, 0.0308226, 0.0295827, 0.0302089, 0.0279134, 0.0310025,
 0.0307556, 0.0286746, 0.0294689, 0.0308359, 0.0307293, 0.0299506, 0.0300688,
 0.0296063, 0.0274996, 0.0284756, 0.0270589, 0.0330454, 0.030539, 0.0311115,
 0.029443, 0.0280583, 0.0267966, 0.0314749, 0.0299161, 0.0282708, 0.0288016,
 0.0295221, 0.0287761, 0.0274223, 0.0312549, 0.0319803, 0.0300784, 0.0292927,
 0.0294041, 0.0292671, 0.0288477, 0.0292154, 0.0288835, 0.0314527, 0.0334092,
 0.0269377, 0.0274382, 0.0269577, 0.0288843, 0.0292987, 0.0295127, 0.0308645,
 0.0269208, 0.0268655, 0.0270826, 0.031325, 0.030364, 0.0283301, 0.0318948,
 0.0304712, 0.0300741, 0.0314799, 0.0300229, 0.0299988, 0.0300871, 0.0298355,
 0.0292753, 0.0283649, 0.026969, 0.0264639, 0.0293044, 0.0320098, 0.0286707, 0.02791,
 0.0299448, 0.0280975, 0.0262646, 0.0291987, 0.0292362, 0.0279413, 0.0293459,
 0.0311227, 0.0319408, 0.0269473, 0.0272084, 0.0268916, 0.0319791, 0.0304849,
 0.0316307, 0.0279149, 0.0290444, 0.0272187, 0.0284902, 0.0296621, 0.0298022,
 0.0259906, 0.0304092, 0.0285847, 0.0289238, 0.0274401, 0.0266201, 0.0284474,
 0.0251996, 0.0260894, 0.0264054, 0.0280166, 0.0263082, 0.0280608, 0.0282637,
 0.028721, 0.0267842, 0.0284708, 0.0282039, 0.0310513, 0.0306831, 0.0256274,
```

```
0.0299744, 0.0302392, 0.028411, 0.0268921, 0.0282876, 0.0272309, 0.0295187,
0.0284311, 0.0292189, 0.030888, 0.0295172, 0.0283526, 0.029131, 0.0271801,
0.0272456, 0.0268709, 0.0241725, 0.0288412, 0.0308484, 0.0272023, 0.0309978,
0.0258413, 0.0265129, 0.025288, 0.0284406, 0.030887, 0.0285126, 0.030241, 0.0305301,
0.0277015, 0.0283182, 0.0254561, 0.026178, 0.0289057, 0.0275169, 0.0265631,
0.0282146, 0.0281343, 0.0257354, 0.0257867, 0.0275971, 0.0305003, 0.0250887,
0.0286367, 0.0275837, 0.0299809, 0.0269191, 0.0271232, 0.0278081, 0.0250176,
0.0263104, 0.0281071, 0.0273854, 0.0271193, 0.0274228, 0.0270848, 0.028575,
0.0261792, 0.0289222, 0.0286117, 0.0299716, 0.0265347, 0.0257538, 0.0293858,
0.0278307, 0.0287447, 0.02518, 0.0287814, 0.0275533, 0.0271049, 0.0260446,
0.0312786, 0.0289664, 0.0289098, 0.0286249, 0.0284162, 0.028047, 0.0298645,
0.0305565, 0.0290134, 0.0257437, 0.0283821, 0.0285765, 0.0270962, 0.0270562,
0.030112, 0.0307197, 0.0281179, 0.0280355, 0.0284853, 0.0297356, 0.0272311,
0.0292573, 0.0298684, 0.0282791, 0.0298311, 0.030991, 0.0263123, 0.0301516,
0.0270942, 0.0260118, 0.0269904, 0.0272282, 0.0312433, 0.0302584, 0.0277386,
0.0306288, 0.0316165, 0.030213, 0.0285528, 0.0275391, 0.0298418, 0.0297673,
0.0296744, 0.0261693, 0.0291788, 0.0286164, 0.0295502, 0.0310366, 0.0279183,
0.0297483, 0.0275803, 0.0275507, 0.0296945, 0.0291077, 0.0285463, 0.0278181,
0.0266653, 0.0269128, 0.0277101, 0.0284481, 0.0287905, 0.0285282, 0.0265334,
0.0276891, 0.0284252, 0.0294637, 0.0271685, 0.0268438, 0.0294862, 0.0287769,
0.0281955, 0.0305408, 0.0292695, 0.0287522, 0.0282718, 0.0277104, 0.0294102,
0.0305477, 0.0280443, 0.0272991, 0.0287844, 0.0301981, 0.0297668, 0.028636,
0.0297227, 0.0295994, 0.0305125, 0.0316617, 0.0309546, 0.0291947, 0.0291727}
```

In[•]:= `colors = {■, ■, ■, ■, ■, ■, ■, ■, ■, ■, ■, ■};`

In[•]:=
```
ListLinePlot[
 {data, Style[Transpose[{peaksB[[All, 1]], peaksB[[All, 2]]}], colors[[-1]]},
 Joined → {True, False},
 PlotStyle → {Automatic, PointSize[.01]},
 PlotLabel → "Peaks of Articles Occur after Degree Multiples of 3.05",
 AxesLabel → {"Degrees", "Articles"}]
```

Out[•]=



In[•]:=
```
lmB = LinearModelFit[peaksB[[All, 1]] - 1, x, x]
```

Out[•]=
```
FittedModel[-3.66837 + 3.05648 x]
```

In[•]:=
```
lmB["BestFit"](*this implies that peaks occur about every three degrees,
 i.e. in the tenth harmonic or D10 and/or may suggest orb*)
```

Out[•]=
```
-3.66837 + 3.05648 x
```

In[•]:=
```
30^(1/2)
```

Out[•]=
$$\sqrt{30}$$

In[•]:=
```
N[√30]
```

Out[•]=
```
5.47723
```

In[ ]:= **lmB["ANOVATable"]**

Out[ ]=

	DF	SS	MS	F-Statistic	P-Value
x	1	1.1533×10^{6}	1.1533×10^{6}	79340.2	1.68631×10^{-161}
Error	112	1628.04	14.5361		
Total	113	1.15493×10^{6}			

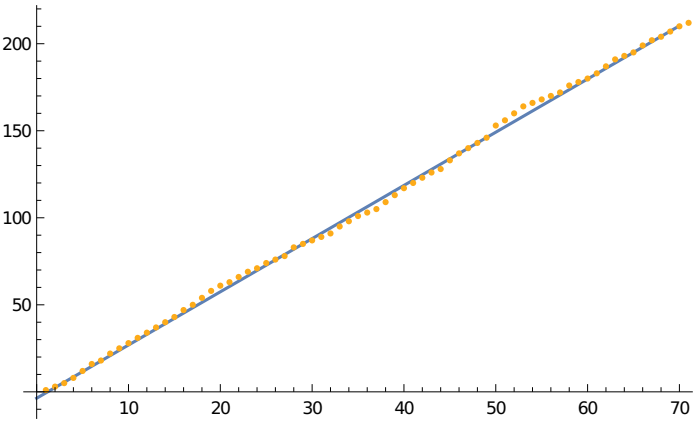
In[ ]:= **lmB["ANOVATable"] // OutputForm**

Out[ ]//OutputForm=

	DF	SS	MS	F-Statistic	P-Value
x	1	1.1533 10^{6}	1.1533 10^{6}	79340.2	1.68631 10^{-161}
Error	112	1628.04	14.5361		
Total	113	1.15493 10^{6}			

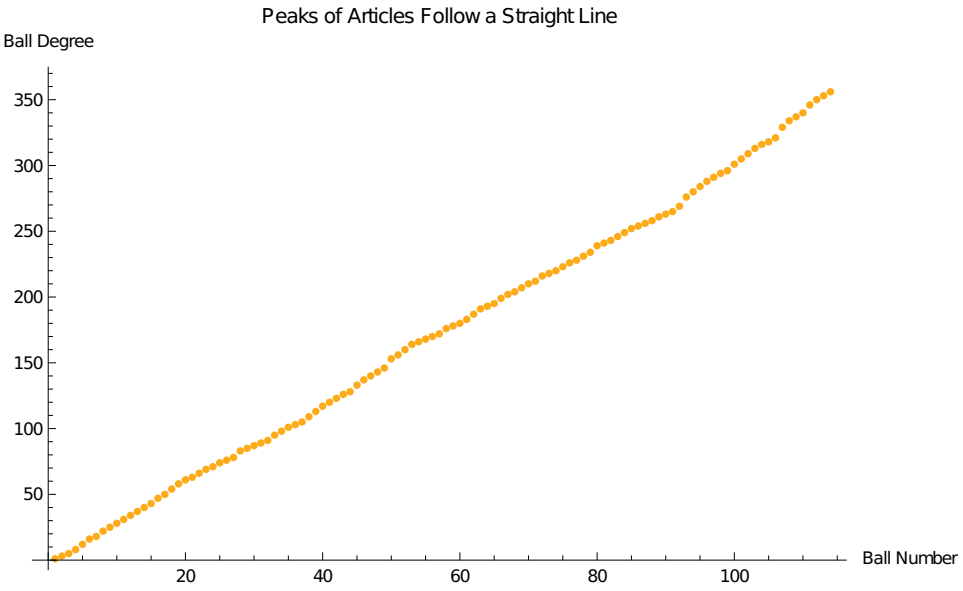
In[ ]:= **Show[Plot[lmB["BestFit"], {x, 0, 70}], ListPlot[Style[peaksB[[All, 1]] - 1, colors[[-1]]]]**

Out[ ]=



In[•]:=
```
ListPlot[Style[peaksB[[All, 1]] - 1, colors[[-1]]],
 PlotLabel → "Peaks of Articles Follow a Straight Line",
 AxesLabel → {"Ball Number", "Ball Degree"}]
```

Out[•]=

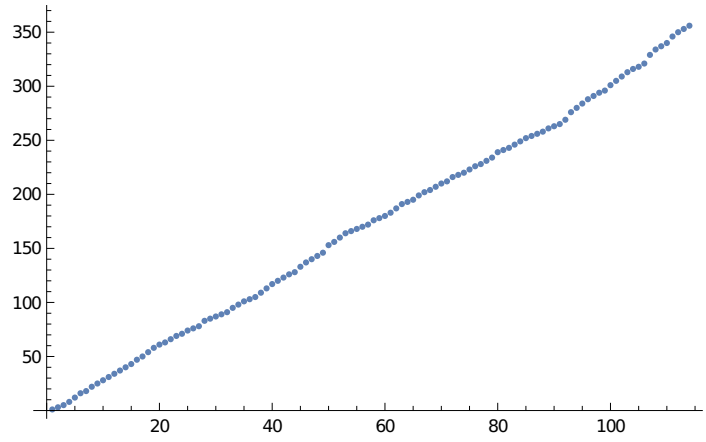


In[•]:=
```
peaksB
```

Out[•]=
```
{{2, 0.0290893}, {4, 0.0293737}, {6, 0.0297311}, {9, 0.0308112}, {13, 0.0321638},
 {17, 0.0283326}, {19, 0.0302212}, {23, 0.0310809}, {26, 0.0296532}, {29, 0.0313297},
 {32, 0.0307711}, {35, 0.0312456}, {38, 0.0310129}, {41, 0.0306607}, {44, 0.0314249},
 {48, 0.0298134}, {51, 0.0317037}, {55, 0.0305606}, {59, 0.0303074}, {62, 0.0294147},
 {64, 0.0295248}, {67, 0.0291229}, {70, 0.0320116}, {72, 0.0321461}, {75, 0.031489},
 {77, 0.0326921}, {79, 0.031653}, {84, 0.0328643}, {86, 0.0299095}, {88, 0.0308226},
 {90, 0.0302089}, {92, 0.0310025}, {96, 0.0308359}, {99, 0.0300688}, {102, 0.0284756},
 {104, 0.0330454}, {106, 0.0311115}, {110, 0.0314749}, {114, 0.0295221}, {118, 0.0319803},
 {121, 0.0294041}, {124, 0.0292154}, {127, 0.0334092}, {129, 0.0274382}, {134, 0.0308645},
 {138, 0.031325}, {141, 0.0318948}, {144, 0.0314799}, {147, 0.0300871}, {154, 0.0320098},
 {157, 0.0299448}, {161, 0.0292362}, {165, 0.0319408}, {167, 0.0272084}, {169, 0.0319791},
 {171, 0.0316307}, {173, 0.0290444}, {177, 0.0298022}, {179, 0.0304092},
 {181, 0.0289238}, {184, 0.0284474}, {188, 0.0280166}, {192, 0.028721}, {194, 0.0284708},
 {196, 0.0310513}, {200, 0.0302392}, {203, 0.0282876}, {205, 0.0295187}, {208, 0.030888},
 {211, 0.029131}, {213, 0.0272456}, {217, 0.0308484}, {219, 0.0309978}, {221, 0.0265129},
 {224, 0.030887}, {227, 0.0305301}, {229, 0.0283182}, {232, 0.0289057}, {235, 0.0282146},
 {240, 0.0305003}, {242, 0.0286367}, {244, 0.0299809}, {247, 0.0278081}, {250, 0.0281071},
 {253, 0.0274228}, {255, 0.028575}, {257, 0.0289222}, {259, 0.0299716}, {262, 0.0293858},
 {264, 0.0287447}, {266, 0.0287814}, {270, 0.0312786}, {277, 0.0305565}, {281, 0.0285765},
 {285, 0.0307197}, {289, 0.0297356}, {292, 0.0298684}, {295, 0.030991}, {297, 0.0301516},
 {302, 0.0312433}, {306, 0.0316165}, {310, 0.0298418}, {314, 0.0291788}, {317, 0.0310366},
 {319, 0.0297483}, {322, 0.0296945}, {330, 0.0287905}, {335, 0.0294637}, {338, 0.0294862},
 {341, 0.0305408}, {347, 0.0305477}, {351, 0.0301981}, {354, 0.0297227}, {357, 0.0316617}}
```

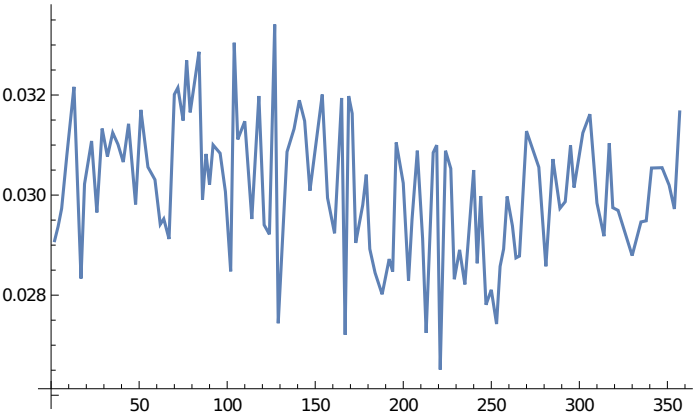
In[•]:=
```
ListPlot[peaksB[[All, 1]] - 1]
```

Out[•]=



In[•]:=
```
ListPlot[peaksB, Joined → True]
```

Out[•]=



In[•]:=
```
fp2 = FindPeaks[peaksB[[All, 2]], StandardDeviation[peaksB[[All, 2]]]]
 (*These are peaks of the peaks*)
```

Out[•]=
```
{{5, 0.0321638}, {8, 0.0310809}, {10, 0.0313297}, {12, 0.0312456}, {15, 0.0314249},
 {17, 0.0317037}, {21, 0.0295248}, {24, 0.0321461}, {26, 0.0326921},
 {28, 0.0328643}, {30, 0.0308226}, {32, 0.0310025}, {36, 0.0330454}, {38, 0.0314749},
 {40, 0.0319803}, {43, 0.0334092}, {47, 0.0318948}, {50, 0.0320098}, {53, 0.0319408},
 {55, 0.0319791}, {59, 0.0304092}, {63, 0.028721}, {65, 0.0310513}, {69, 0.030888},
 {73, 0.0309978}, {75, 0.030887}, {78, 0.0289057}, {80, 0.0305003}, {82, 0.0299809},
 {84, 0.0281071}, {88, 0.0299716}, {92, 0.0312786}, {95, 0.0307197}, {98, 0.030991},
 {101, 0.0316165}, {104, 0.0310366}, {111, 0.0305477}, {114, 0.0316617}}
```

In[•]:=
```
(*fp2=FindPeaks[peaksB[[All,2]] (*These are peaks of the peaks*)*)
```

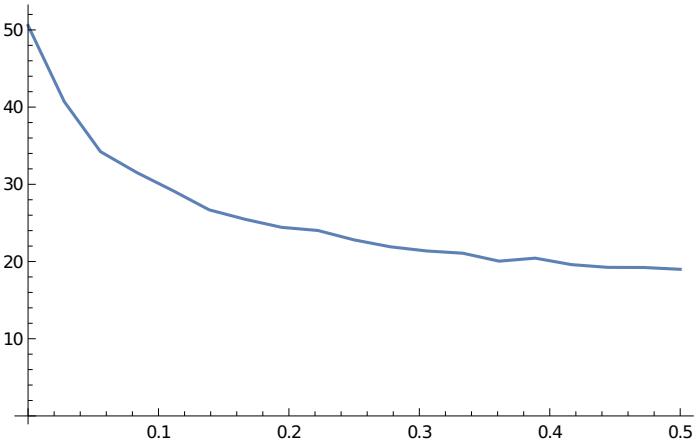
In[•]:=
```
Length[fp2]
```

Out[•]=
```
38
```

In[•]:=
```
(*fp2=FindPeaks[peaksB[[All,2]](*,StandardDeviation[peaksB[[All,2]]*)]
(*These are peaks of the peaks*)*)
```

In[•]:=
```
Periodogram[fp2[[All, 1]] - 1, PlotRange → All]
```

Out[•]=

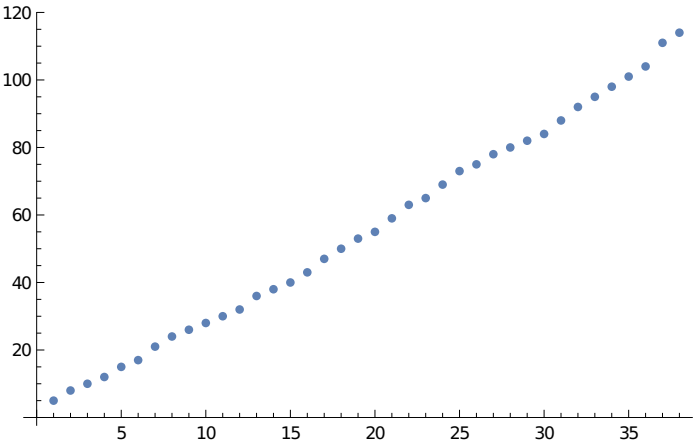


In[•]:=
```
f = Abs[Fourier[fp2[[All, 1]]]];
peaksize = Last[TakeLargest[f, 7]];
peaks = Flatten[Position[f, x_ /; x ≥ peaksize]]
```

Out[•]= {1, 2, 3, 4, 36, 37, 38}

In[•]:=
```
ListPlot[fp2[[All, 1]]]
```

Out[•]=

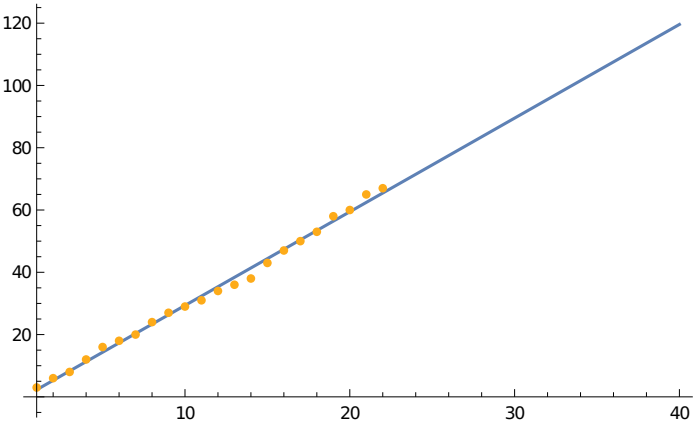


In[•]:=
```
LinearModelFit[fp2[[All, 1]], x, x]["BestFit"]
```

Out[•]= −0.727273 + 3.00791 x

In[•]:=
```
Show[Plot[%, {x, 1, 40}], ListPlot[Style[fp2[[All, 1]], colors[[-1]]]]
```

Out[•]=



In[•]:=
```
LinearModelFit[fp2[[All, 1]], x, x]
```

Out[•]= FittedModel[−0.640114 + 2.89517 x]

In[•]:=
```
LinearModelFit[fp2[[All, 1]], x, x]["ANOVATable"]
```

Out[•]=

	DF	SS	MS	F-Statistic	P-Value
x	1	38301.7	38301.7	11685.4	7.82079×10^{-47}
Error	36	117.999	3.27775		
Total	37	38419.7			

In[•]:=
```
LinearModelFit[fp2[[All, 1]], x, x]["ANOVATable"] // OutputForm
```

Out[•]//OutputForm=

	DF	SS	MS	F-Statistic	P-Value
x	1	38301.7	38301.7	11685.4	$7.82079\ 10^{-47}$
Error	36	117.999	3.27775		
Total	37	38419.7			

In[•]:=
```
bffp2 = LinearModelFit[fp2[[All, 1]] - 1, x, x]["BestFit"]
```

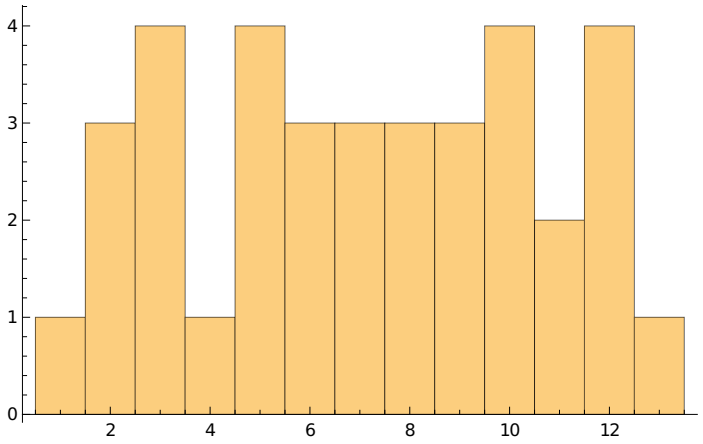
Out[•]=
$$-1.64011 + 2.89517\ x$$

In[•]:=
```
FullSimplify[-1.7272727272727202` + 3.0079051383399205` x]
```

Out[•]=
$$-1.72727 + 3.00791\ x$$

In[•]:=
```
Histogram[Round[Mod[Table[-12.2607 + 8.84903 x, {x, 1, 36}], 12] + 1], 12]
```

Out[•]=



In[•]:=
```
h = Table[Mod[Floor[bffp2 - 1], 12] + 1, {x, 1, 30}]
```

Out[•]=
```
{1, 4, 7, 10, 1, 4, 7, 10, 1, 4, 7, 10, 1,
 4, 7, 10, 1, 4, 7, 10, 1, 4, 7, 10, 1, 4, 7, 10, 1, 4}
```

In[•]:=
```
fp2
```

Out[•]=
```
{{3, 0.0321638}, {6, 0.0313297}, {8, 0.0312456}, {12, 0.0317037}, {16, 0.0328643},
 {18, 0.0310025}, {20, 0.0330454}, {24, 0.0334092}, {27, 0.0318948},
 {29, 0.0320098}, {31, 0.0319791}, {34, 0.0304092}, {36, 0.0310513},
 {38, 0.030888}, {43, 0.0305003}, {47, 0.0299716}, {50, 0.0312786}, {53, 0.0307197},
 {58, 0.0316165}, {60, 0.0310366}, {65, 0.0305477}, {67, 0.0316617}}
```

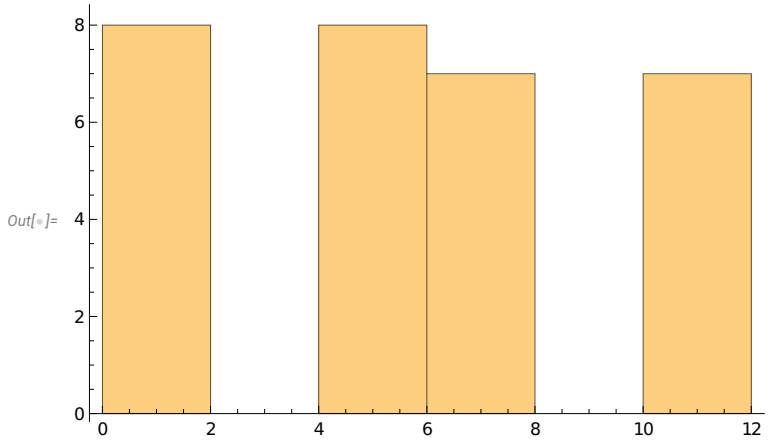
In[•]:=
```
h1 = Mod[fp2[[All, 1]] - 1, 12] + 1
```

Out[•]=
```
{3, 6, 8, 12, 4, 6, 8, 12, 3, 5, 7, 10, 12, 2, 7, 11, 2, 5, 10, 12, 5, 7}
```

Peaks of peaks may land in house 1, 4, 7, 10; i.e. the square houses a.k.a. kendras.

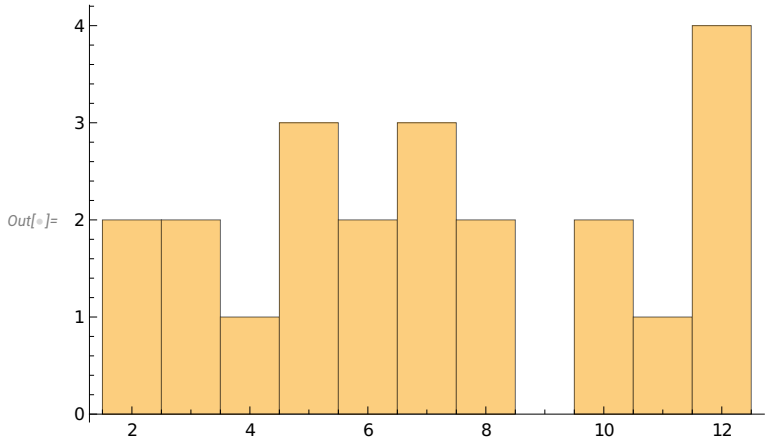
In[•]:=
```
Histogram[h, 12](*modeled peaks of peaks*)
```

Out[•]=



In[•]:=
```
Histogram[h1, {1}](*actual peaks of peaks*)
```

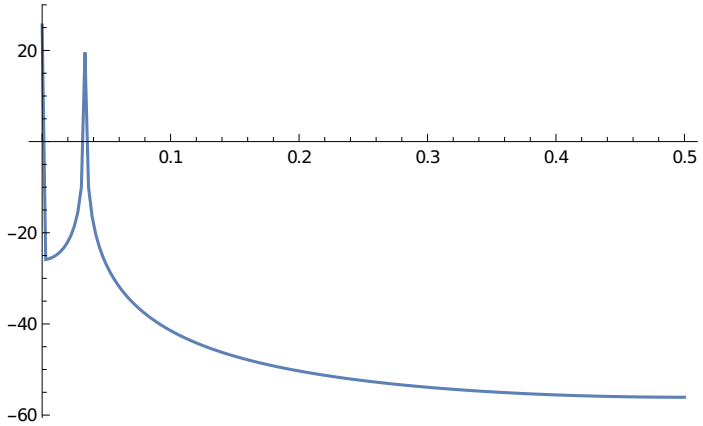
Out[•]=



Idealized Theoretical Result

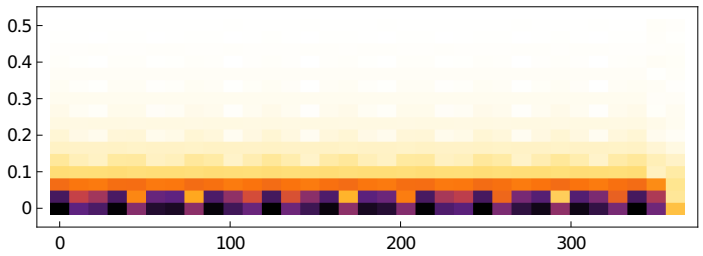
In[•]:=
```
Periodogram[Table[Sin[360 * (i - 30) / 30] + 1, {i, 0, 2 Pi, 2 Pi / 360}], PlotRange → All]
```

Out[•]=



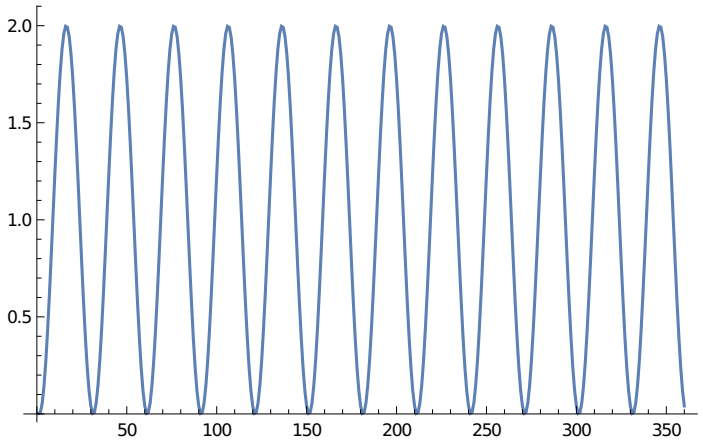
In[•]:=
```
Spectrogram[Table[Sin[360 * (i - 30) / 30] + 1, {i, 0, 2 Pi, 2 Pi / 360}]]
```

Out[•]=



In[•]:=
```
ListPlot[Table[Sin[(360 * (i - 30) / 30)] + 1, {i, 2 Pi / 360, 2 Pi, 2 Pi / 360}], Joined → True]
```

Out[•]=



In[•]:=
```
sinpeaks = FindPeaks[N[Table[Sin[(360 * (i - 30) / 30)] + 1, {i, 2 Pi / 360, 2 Pi, 2 Pi / 360}]]]
```

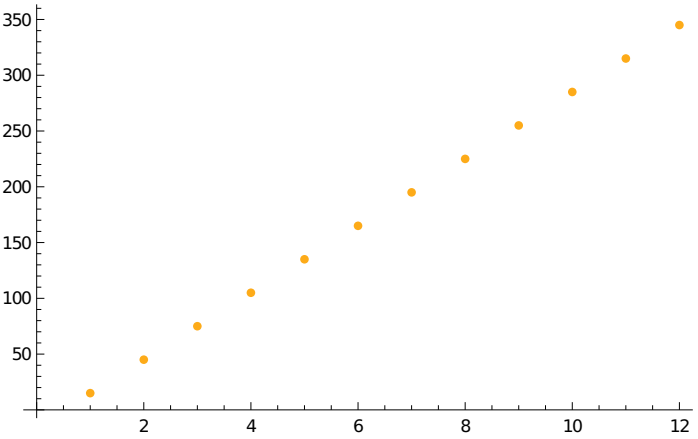
Out[•]=
```
{{16, 1.99694}, {46, 1.99694}, {76, 1.99694}, {106, 1.99694},
 {136, 1.99694}, {166, 1.99694}, {196, 1.99694}, {226, 1.99694},
 {256, 1.99694}, {286, 1.99694}, {316, 1.99694}, {346, 1.99694}}
```

In[•]:=
```
sinpeaks[[All, 1]] - 1
```

Out[•]=
```
{15, 45, 75, 105, 135, 165, 195, 225, 255, 285, 315, 345}
```

In[•]:=
```
ListPlot[Style[sinpeaks[[All, 1]] - 1, colors[[-1]]]]
```

Out[•]=

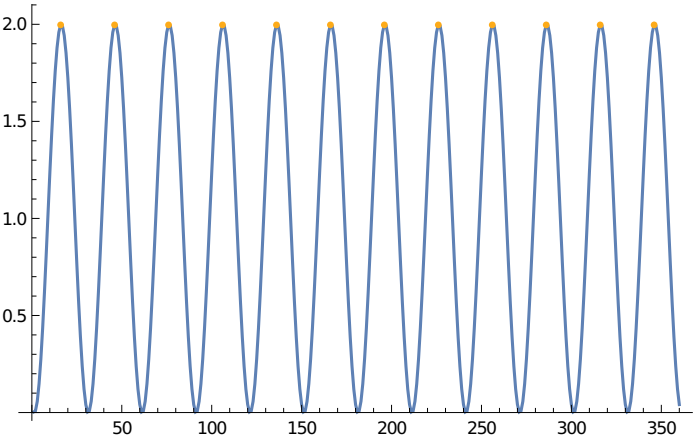


In[•]:=
```
LinearModelFit[sinpeaks[[All, 1]] - 1, x, x]
```

Out[•]=
```
FittedModel[ -15. + 30. x ]
```

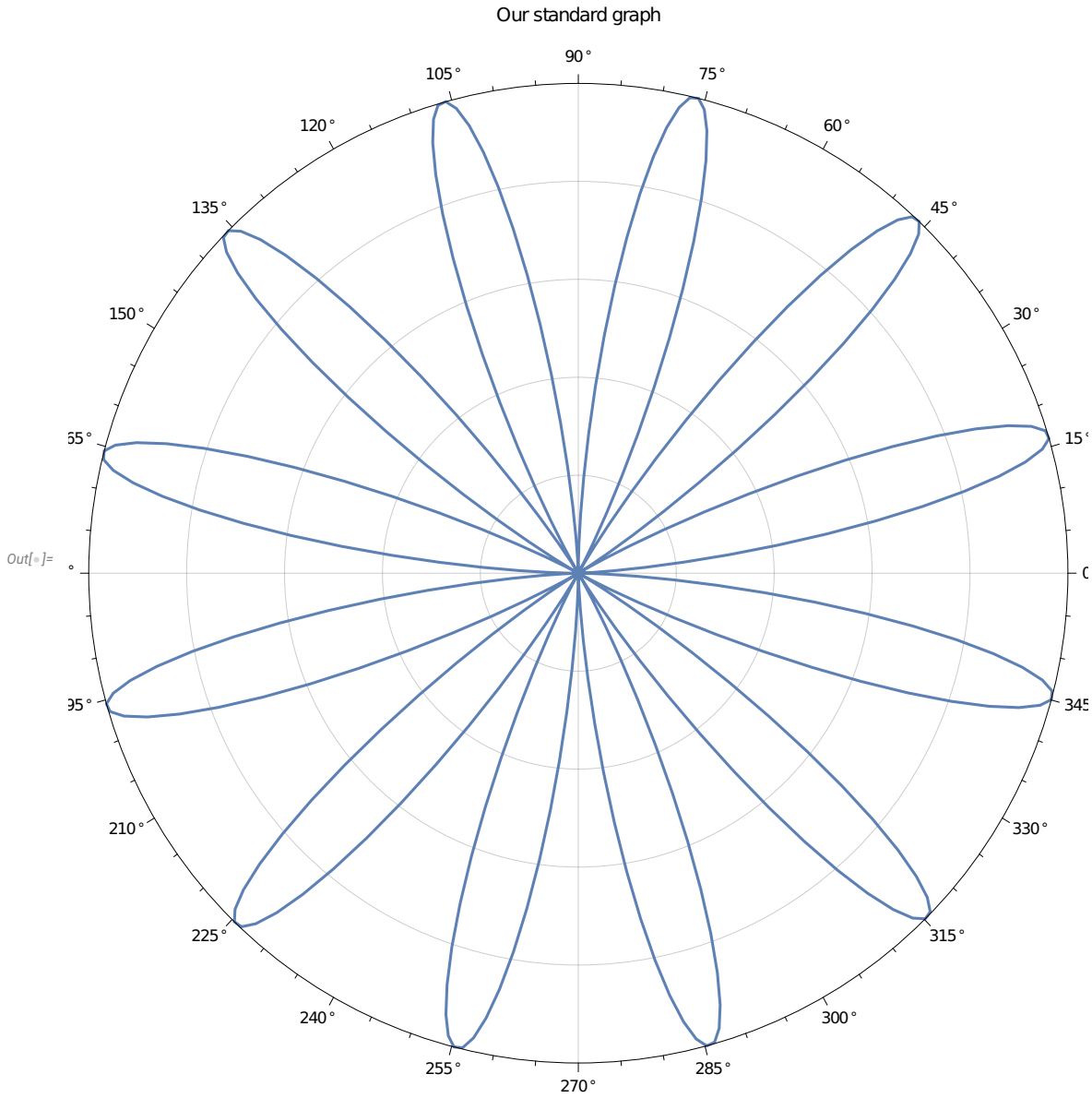
In[•]:=
```
ListLinePlot[
 {N[Table[Sin[360 * (i - 30) / 30] + 1, {i, 2 Pi / 360, 2 Pi, 2 Pi / 360}]],
  Style[sinpeaks, colors[[-1]]]},
 Joined → {True, False},
 PlotStyle → {Automatic, PointSize[.01]}]
```

Out[•]=



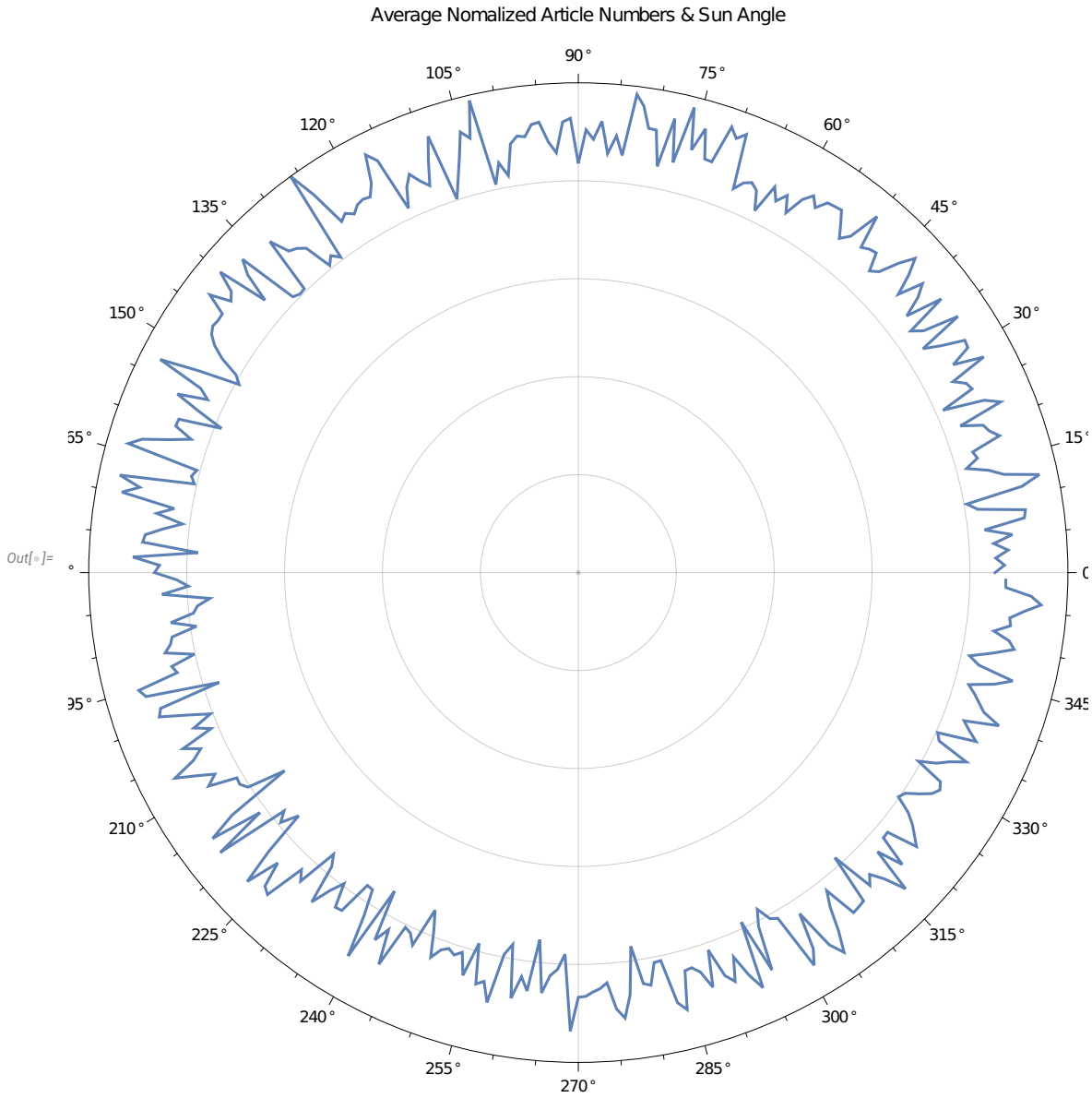
In[•]:=
```
ListPolarPlot[Table[Sin[360 * (i - 30) / 30] + 1, {i, 0, 2 Pi, 2 Pi / 360}],
 PlotLabel → "Our standard graph", PolarAxes → Automatic,
 PolarGridLines → {{0, Pi / 2, Pi, 3 Pi / 2}, Automatic},
 PolarTicks → {"Degrees", Automatic}(*,PlotLegends→{"True","False","Markers"}*),
 PlotRange → All, ImageSize → Large, Joined → True]
```

Out[•]=



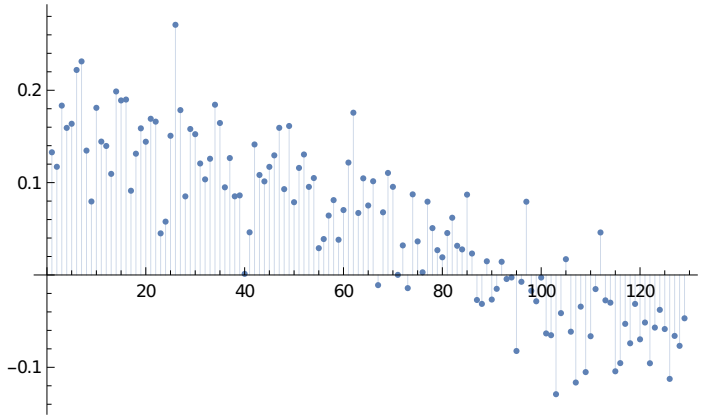
In[•]:=
```
lpp = ListPolarPlot[data, PlotLabel → (*TextWords[sundata[[1]][[1*2]][[1]]<>*)
  "Average Nomalized Article Numbers & Sun Angle",
 PolarAxes → Automatic, PolarGridLines → {{0, Pi/2, Pi, 3 Pi/2}, Automatic},
 PolarTicks → {"Degrees", Automatic}(*,PlotLegends→{"True","False","Markers"}*),
 PlotRange → All, ImageSize → Large, Joined → True]
```

Out[•]=



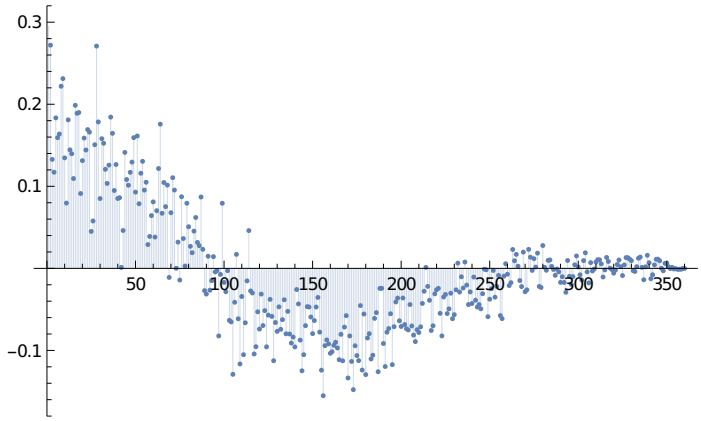
In[•]:=
```
ListPlot[CorrelationFunction[data, {2, 130}], Filling → 0, PlotRange → All]
```

Out[•]=



In[•]:=
```
ListPlot[CorrelationFunction[data, {359}], Filling → 0(*,PlotRange→All*)]
```

Out[•]=



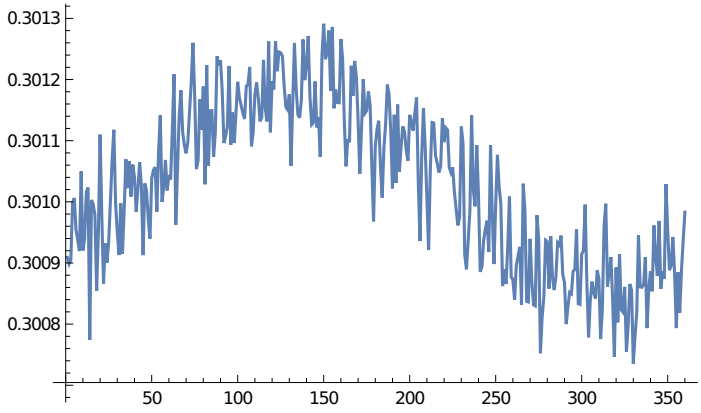
In[•]:=
```
ListPlot[CorrelationFunction[#, {10}], PlotLabel → Head[#], Filling → 0] & /@ candidates
```

Out[•]=
```
candidates
```

https://reference.wolfram.com/language/guide/Wavelets.html

In[•]:=
```
ListLinePlot[ListConvolve[data, data, {1, 1}]](* Autocorrelation*)
```

Out[•]=



In[•]:=
```
AutocorrelationTest[data]
```

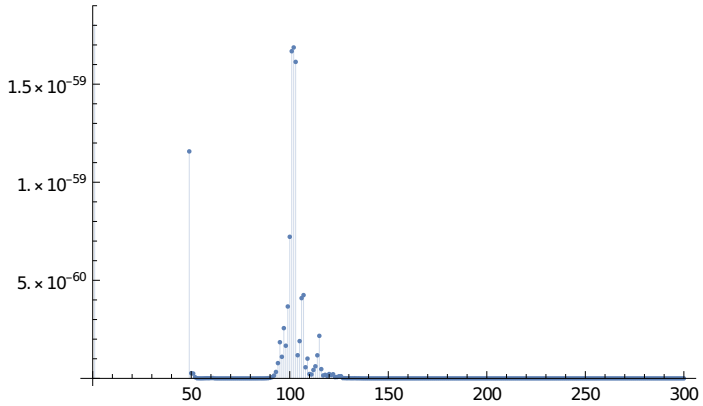
Out[•]= 4.53681×10^{-13}

In[•]:=
```
Table[AutocorrelationTest[data, i], {i, 20}]
```

Out[•]= $\{2.19348 \times 10^{-7}, 5.94288 \times 10^{-8}, 2.45687 \times 10^{-8}, 2.70887 \times 10^{-10}, 1.26845 \times 10^{-11}, 4.53681 \times 10^{-13}, 3.2275 \times 10^{-16}, 1.09275 \times 10^{-19}, 1.77508 \times 10^{-20}, 2.18975 \times 10^{-20}, 2.65556 \times 10^{-22}, 2.52247 \times 10^{-23}, 2.98179 \times 10^{-24}, 1.28123 \times 10^{-24}, 4.56319 \times 10^{-27}, 3.08164 \times 10^{-29}, 1.92264 \times 10^{-31}, 1.53524 \times 10^{-31}, 2.5221 \times 10^{-32}, 1.01259 \times 10^{-33}\}$

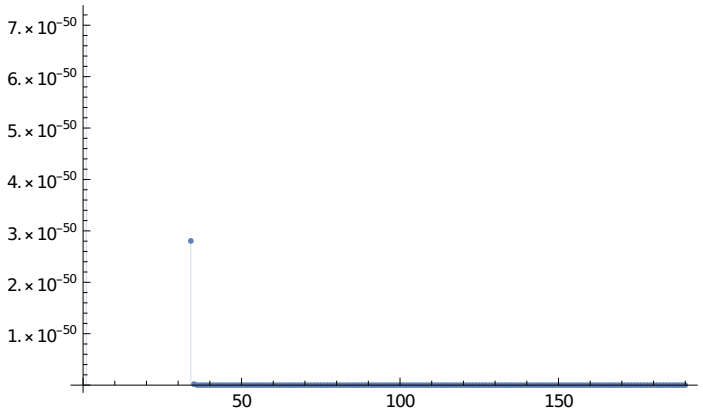
In[•]:=
```
ListPlot[Table[AutocorrelationTest[data, i], {i, 1, 300}],
 Filling → Axis(*,PlotRange→All*)]
```

Out[•]=

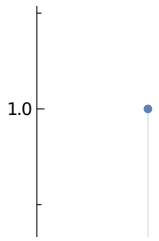


In[•]:=
```
ListPlot[Table[AutocorrelationTest[data, i], {i, 1, 190}],
 Filling → Axis(*,PlotRange→All*)]
```

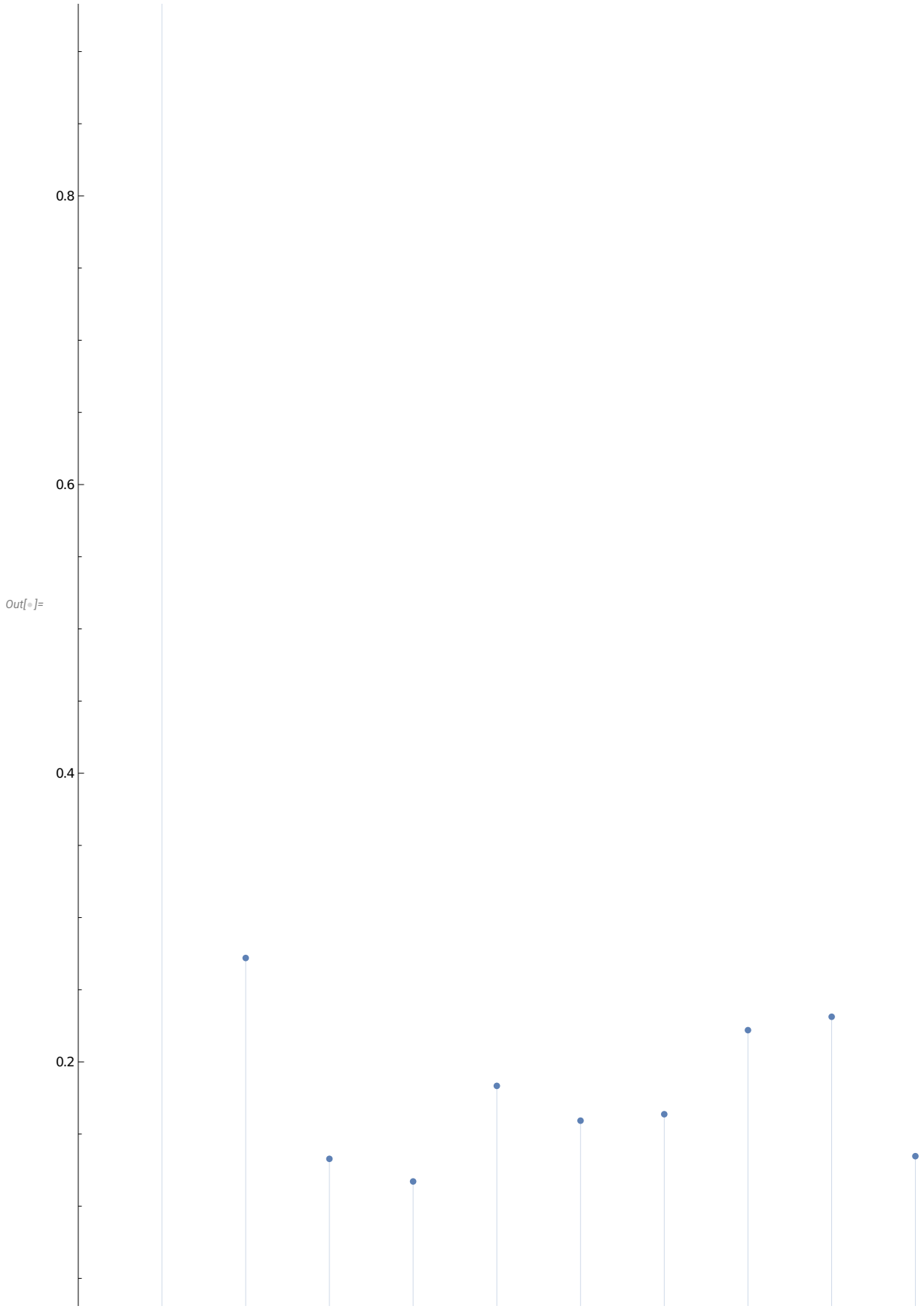
Out[•]=

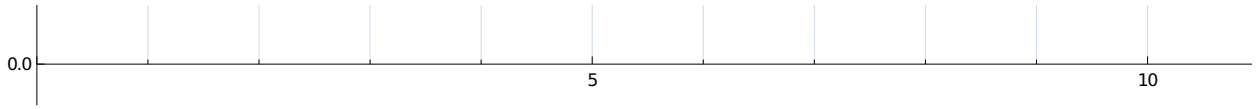


In[•]:=
```
ListPlot[CorrelationFunction[data, {0, 30}], Filling → Axis,
 PlotRange → {{0, 30}, All}, PlotStyle → PointSize[Medium]]
```



Out[•]=

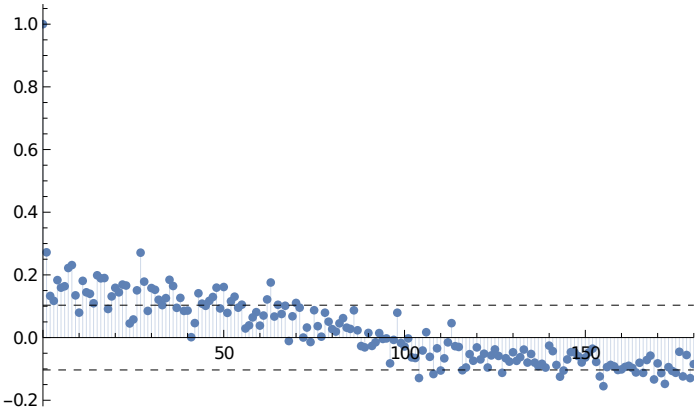




In[•]:=
```
acf[data_, lmax_, clev_ : 0.95] :=
 Show[ListPlot[CorrelationFunction[data, {0, lmax}], Filling → Axis,
   PlotRange → {{0, lmax}, All}, PlotStyle → PointSize[Medium]],
  Graphics[{Dashed, Line[{{0, #}, {lmax, #}}]} & /@ (Quantile[NormalDistribution[],
      {(1 - clev) / 2, 1 - (1 - clev) / 2}] / Sqrt[data["PathLengths"][[1]]])]
```

In[•]:=
```
acf[TimeSeries[data], 180, .95]
```

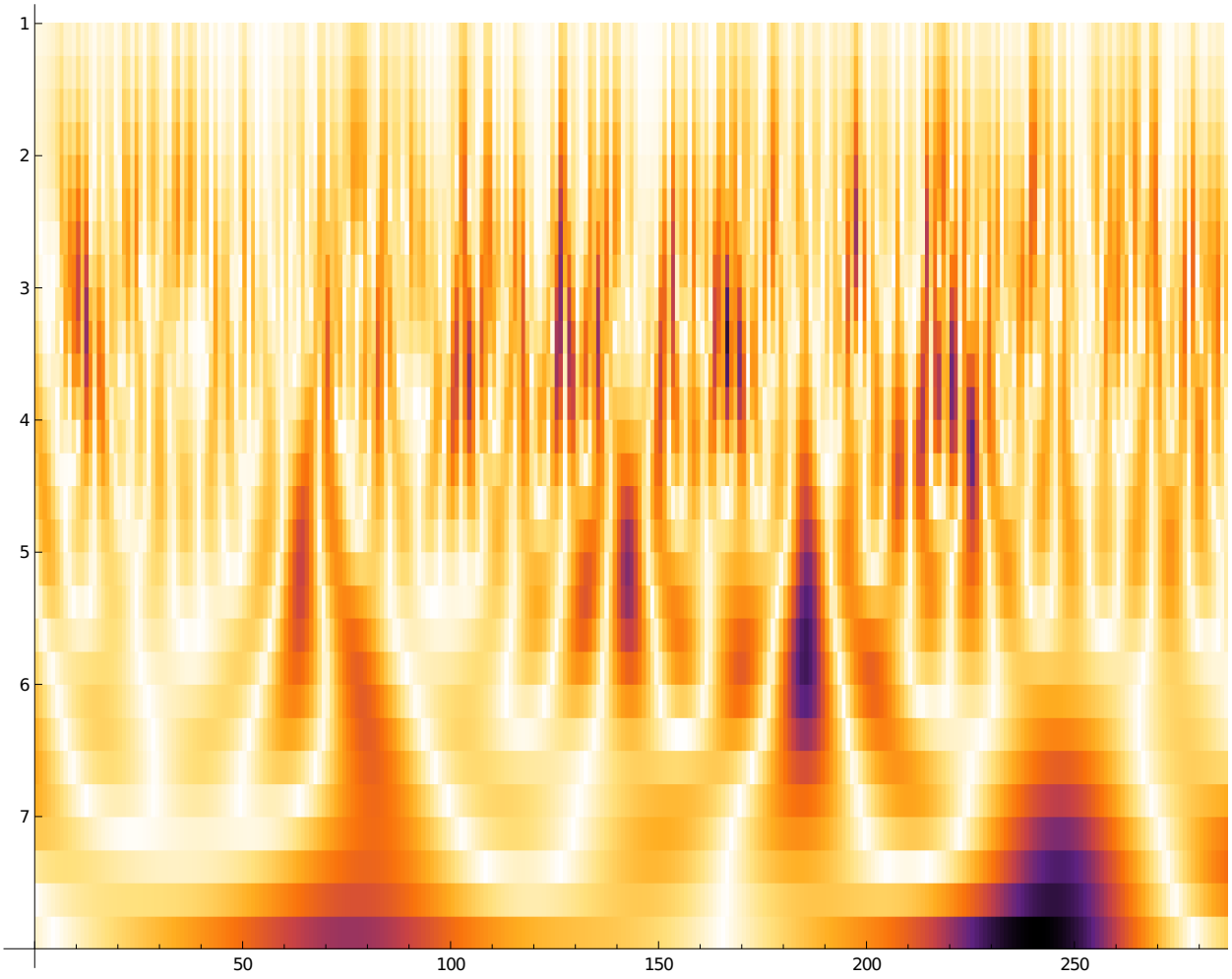
Out[•]=



Reasons why we can't go down to one hundredths of a degree: I suspect that precision largely does not reflect the multi-day process of the news publication cycle, also sampling errors would be too high. Both are good reasons to avoid it.

In[•]:=
```
WaveletScalogram[ContinuousWaveletTransform[data]]
```

Out[•]=

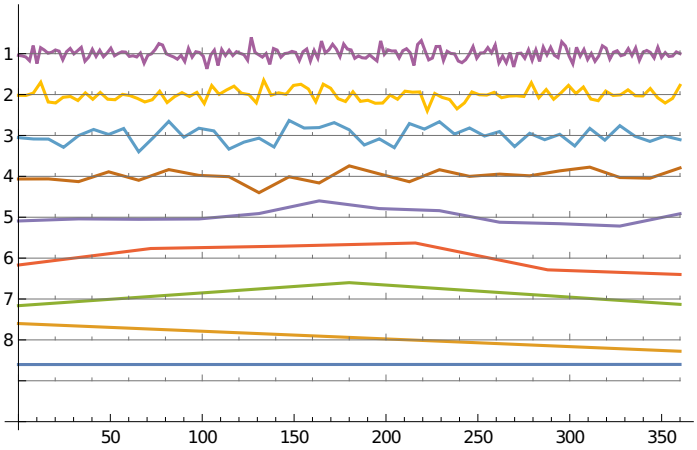


In[•]:=
```
dwd = DiscreteWaveletTransform[data]
```

Out[•]=
```
DiscreteWaveletData[ ⊞ Data dimensions: {360}
                     Refinements: 8 ]
```

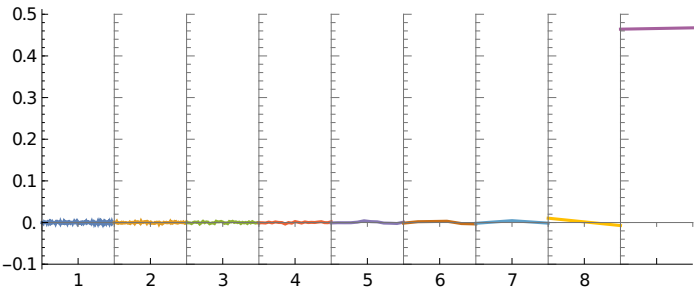
In[•]:=
```
WaveletListPlot[dwd]
```

Out[•]=



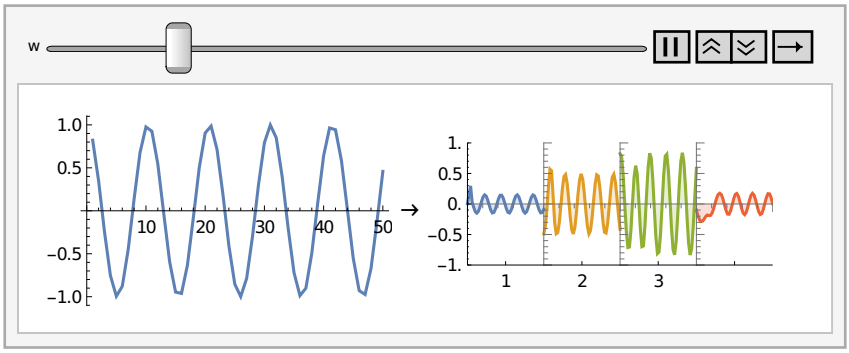
In[•]:=
```
WaveletListPlot[dwd, PlotLayout → "CommonYAxis"]
```

Out[•]=

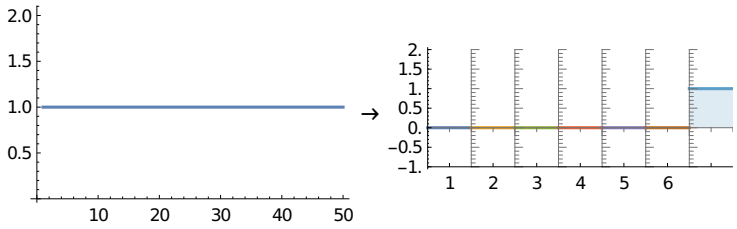


In[•]:=
```
Animate[d = Cos[w Range[50]];
  ListLinePlot[d] → WaveletListPlot[
    StationaryWaveletTransform[d, DaubechiesWavelet[], 3], PlotLayout → "CommonYAxis",
    PlotRange → 1, Filling → Axis, AspectRatio → 1/GoldenRatio], {w, 0, π}]
```

Out[•]=



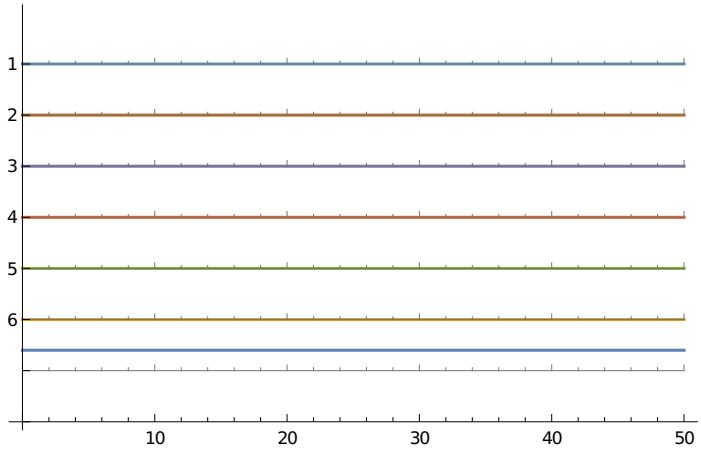
In[•]:=
```
ListLinePlot[d] →
 WaveletListPlot[StationaryWaveletTransform[d], PlotLayout → "CommonYAxis",
  (*PlotRange→1,*)Filling → Axis, AspectRatio → 1 / GoldenRatio]
```

Out[•]=


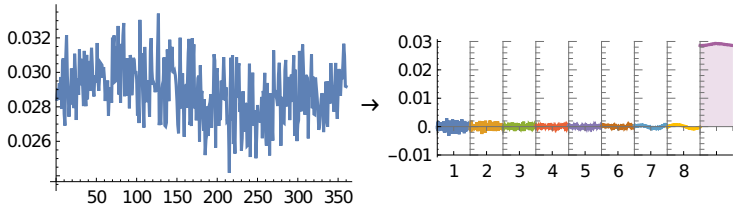
In[•]:=
```
cwd = ContinuousWaveletTransform[data]
```

Out[•]=
```
ContinuousWaveletData[ ⊞ Octaves: 7  Voices: 4
                       Data points: 360 ]
```

In[•]:=
```
WaveletListPlot[StationaryWaveletTransform[d]]
```

Out[•]=


In[•]:=
```
d = data;
ListLinePlot[d] →
 WaveletListPlot[StationaryWaveletTransform[d], PlotLayout → "CommonYAxis",
  (*PlotRange→1,*)Filling → Axis, AspectRatio → 1 / GoldenRatio]
```

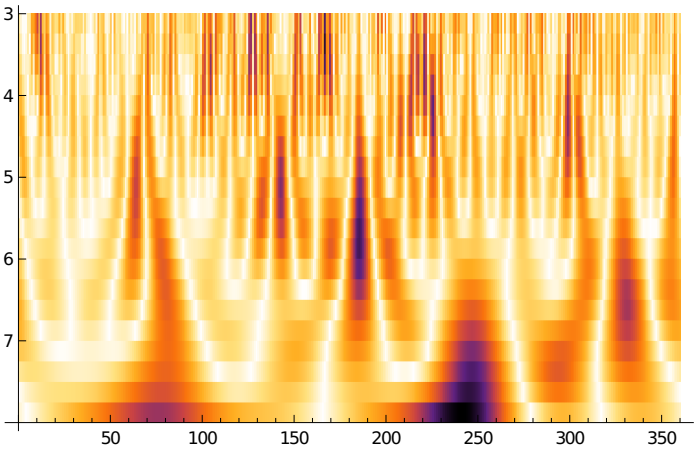
Out[•]=


In[•]:=
```
freq = (#1[[1]] → 8192 / #1[[2]] &) /@ cwd["Scales"];
```

In[•]:=
```
WaveletScalogram[cwd, {1 | 2 | 3, _}]
```

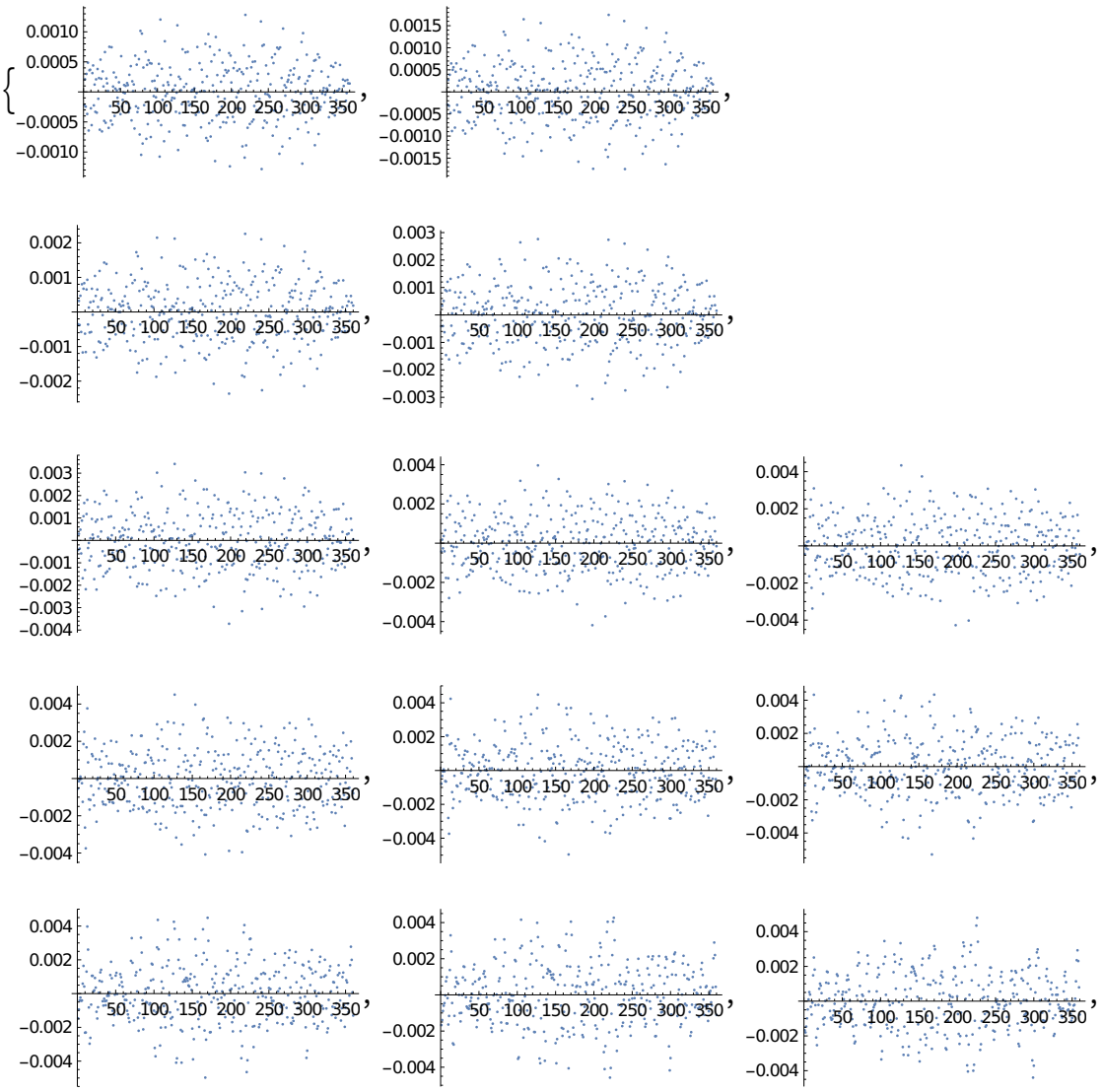
In[•]:=
```
WaveletScalogram[cwd, {3 | 4 | 5 | 6 | 7, _}]
```

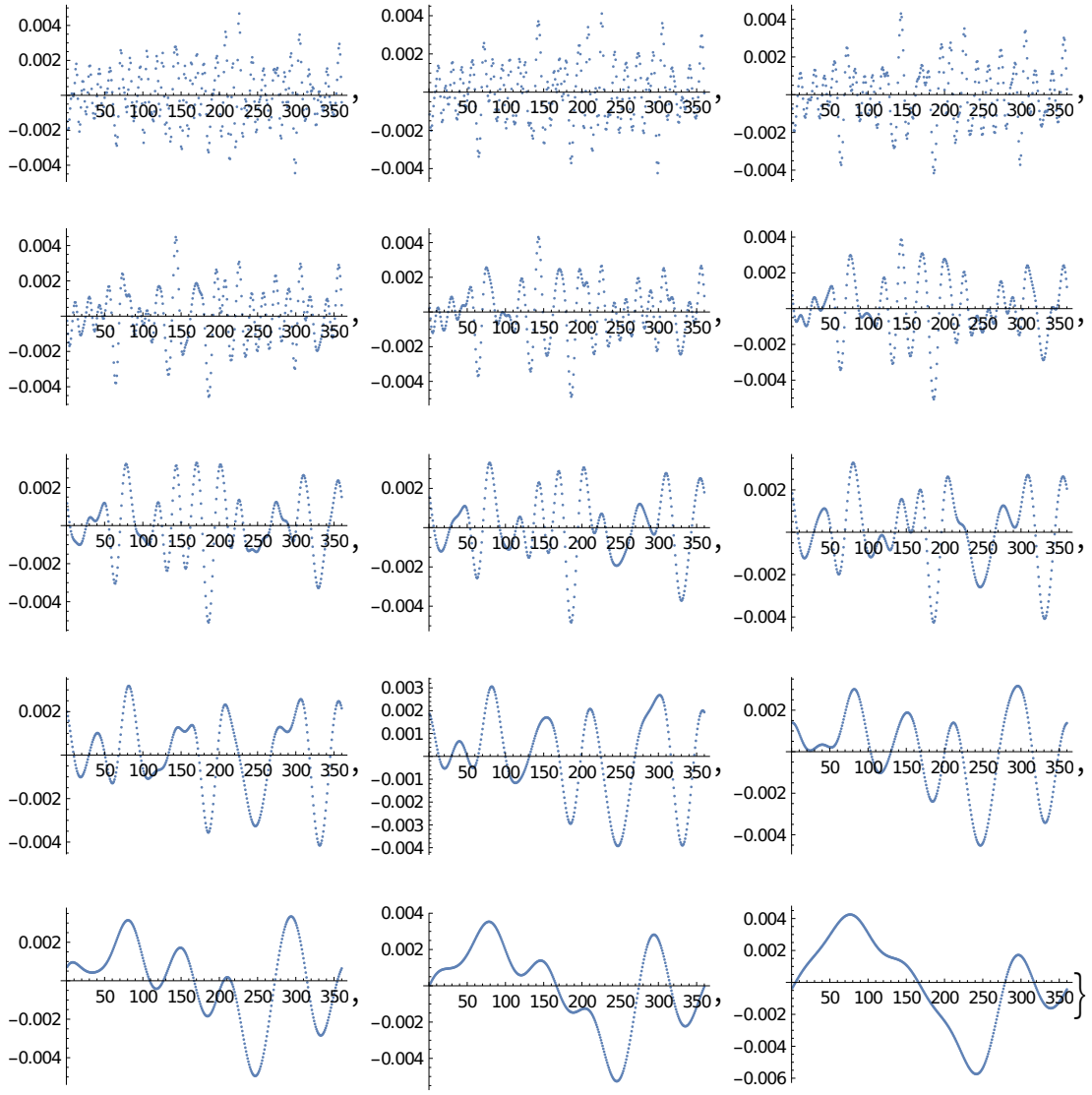
Out[•]=



In[•]:=
```
Table[ListPlot[cwd[All, "Values"][[i]]], {i, Length[cwd[All, "Values"]]}]
```

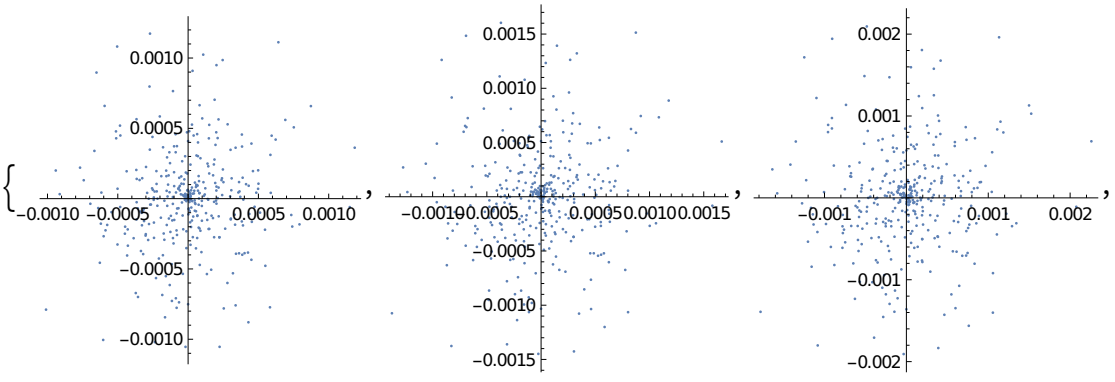
Out[•]=

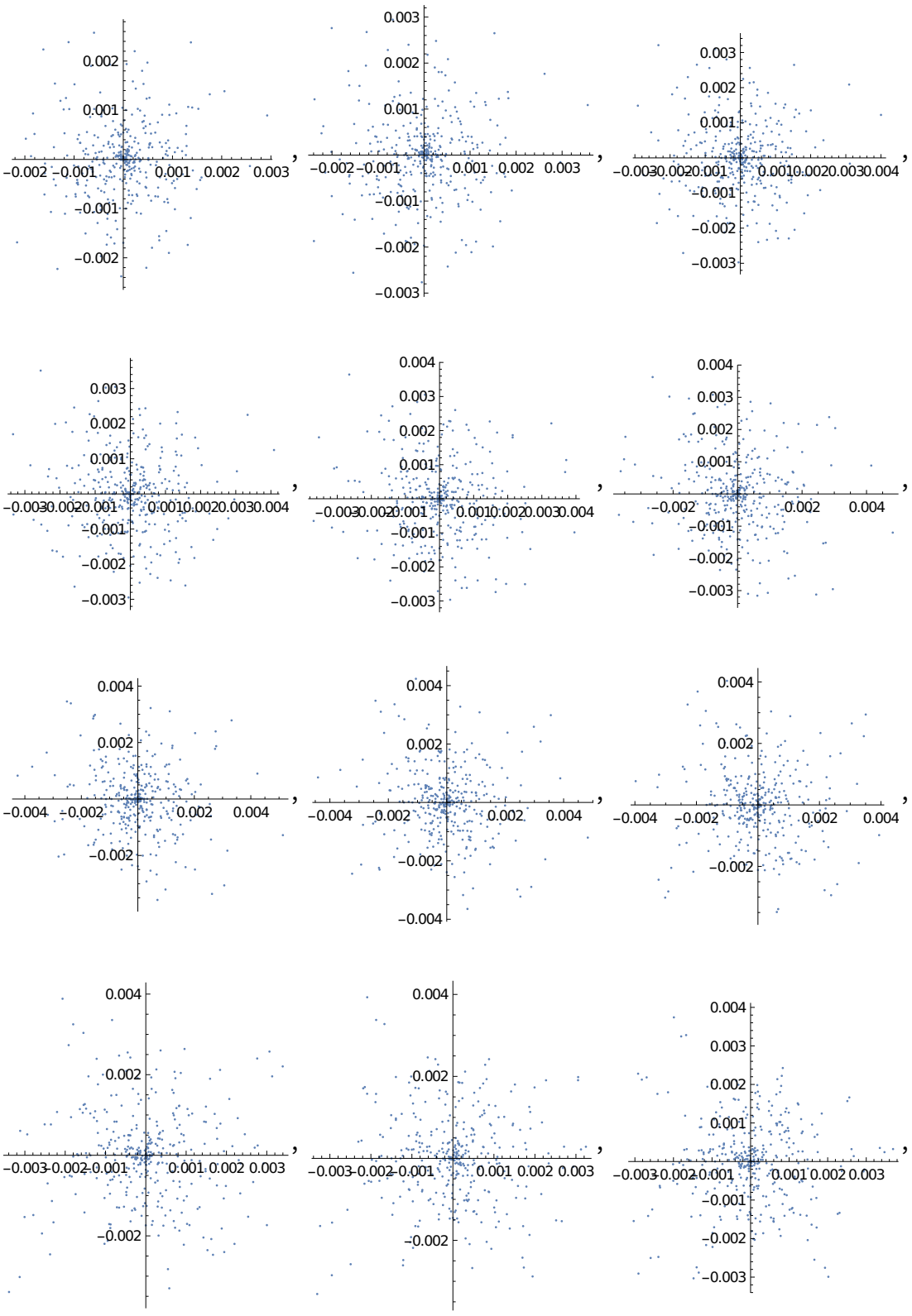


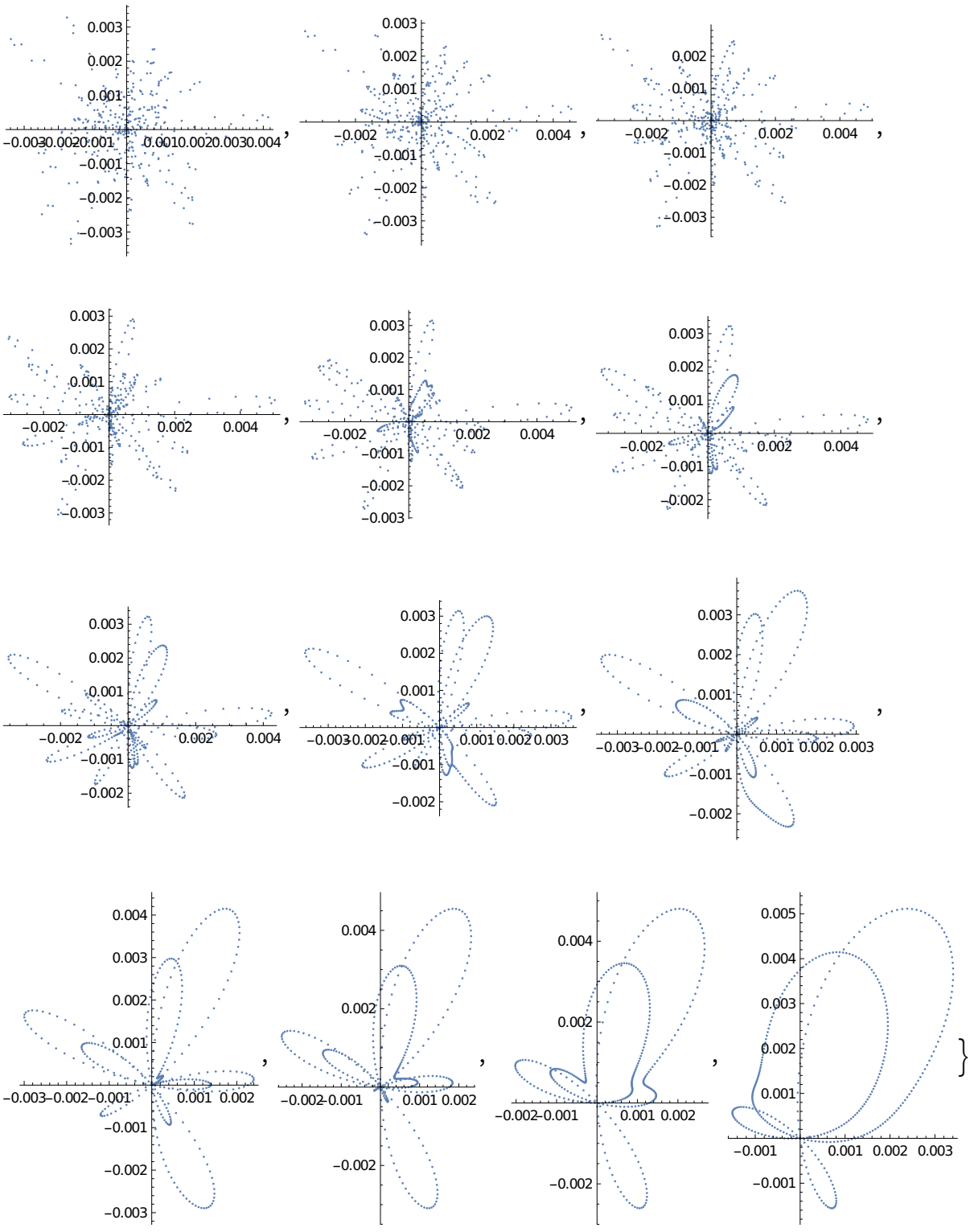


In[•]:=
```
Table[ListPolarPlot[cwd[All, "Values"][[i]]], {i, Length[cwd[All, "Values"]]}]
```

Out[•]=







(Dialog) In[•]:=

```
1 - N[-1 + Sqrt[5]]
```

(Dialog) Out[•]=

```
-0.236068
```

(Dialog) In[•]:=

```
-1 + N[-1 + Sqrt[5]]
```

(Dialog) Out[•]=

```
0.236068
```

In[•]:=

```
(1 + N[Sqrt[5]]) / 2
```

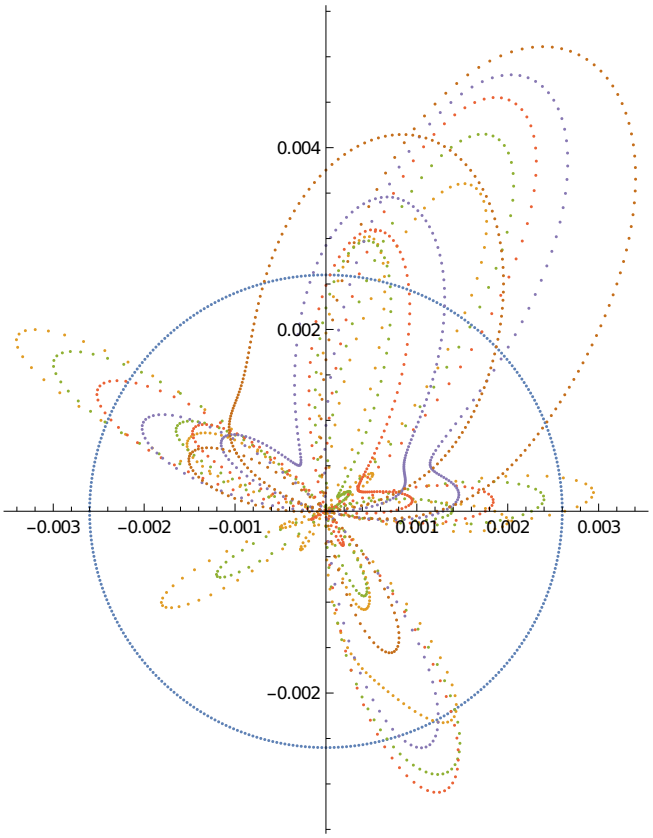
Out[•]=

```
1.61803
```

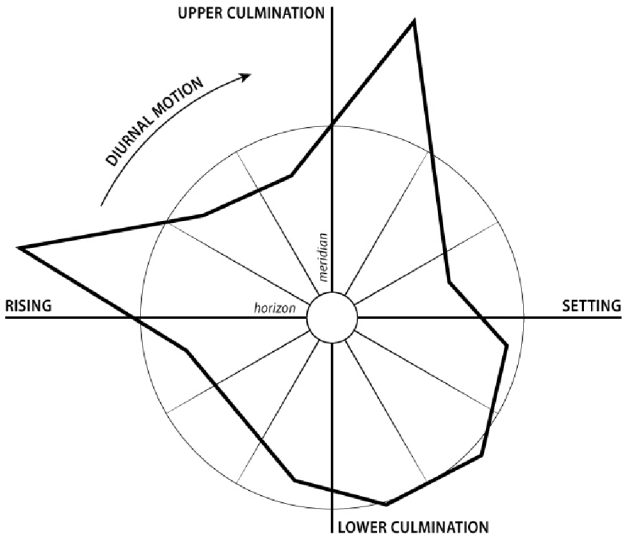
In[•]:=

```
ListPolarPlot[Join[{ConstantArray[0.0052 / 2, 360]}, cwd[All, "Values"][[-5 ;; -1]]]]
```

Out[•]=



In[•]:=



Phi Golden Angles (Landscheidt's grand crosses, etc.)

In[•]:= **gc1 = {137.5, 47.5, 227.5, 317.5}; (*minor golden cross: 360*.382 + squares*)**

In[•]:= **gc1 = Table[Mod[360 * .382 + i * 90, 360], {i, 0, 3}]**

Out[•]= {137.52, 227.52, 317.52, 47.52}

In[•]:= **gc2 = {68.8, 158.8, 248.8, 338.8}; (*minor golden cross: 180*.382 + squares*)**

In[•]:= **gc2 = Table[Mod[180 * .382 + i * 90, 360], {i, 0, 3}]**

Out[•]= {68.76, 158.76, 248.76, 338.76}

In[•]:= **gc3 = {222.5, 132.5, 42.5, 312.5};(*major golden cross: 360*.618 + squares*)**

In[•]:= **gc3 = Table[Mod[360 * .618 + i * 90, 360], {i, 0, 3}]**

Out[•]= {222.48, 312.48, 42.48, 132.48}

In[•]:= **gc4 = {111.2, 21.2, 201.2, 291.2};(*major golden cross: 180*.618 + squares*)**

In[•]:= **gc4 = Table[Mod[180 * .618 + i * 90, 360], {i, 0, 3}]**

Out[•]= {111.24, 201.24, 291.24, 21.24}

In[•]:= **g3 = Table[Mod[360 * (.236) + i * 90, 360], {i, 0, 3}]**
(*special empirical angles that Lanscheidt came up with*)

Out[•]= {84.96, 174.96, 264.96, 354.96}

In[•]:=
```
r = Join[Table[Mod[120. + i * 90, 360], {i, 0, 3}], Table[Mod[90. + i * 90, 360], {i, 0, 3}]]
 (*my observations that we need to include squares and trines*)
```

Out[•]=
```
{120., 210., 300., 30., 90., 180., 270., 0.}
```

```
Union[Flatten[{gc1, gc2, gc3, gc4, g3, r, 360 - g3}]]
```

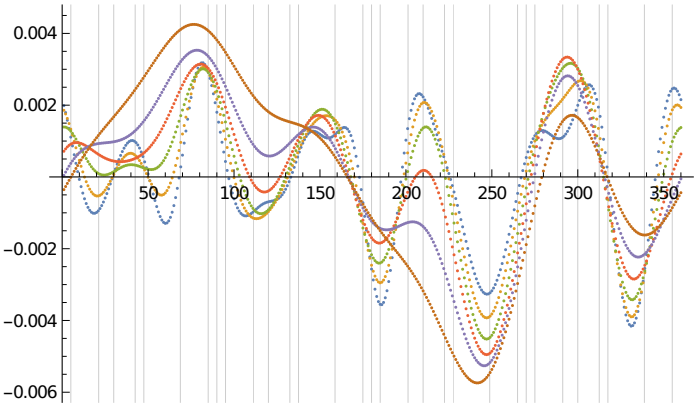
Out[•]=
```
{0., 5.04, 21.24, 30., 42.48, 47.52, 68.76, 84.96, 90., 95.04, 111.24, 120.,
 132.48, 137.52, 158.76, 174.96, 180., 185.04, 201.24, 210., 222.48, 227.52,
 248.76, 264.96, 270., 275.04, 291.24, 300., 312.48, 317.52, 338.76, 354.96}
```

In[•]:=
```
Length[%]
```

Out[•]=
```
32
```

```
ListPlot[ContinuousWaveletTransform[data][All, "Values"][[-6 ;; -1]],
 GridLines → {Union[Flatten[{gc1, gc2, gc3, gc4, g3, r, 360 - g3}]]}, ImageSize → Large]
```

Out[•]=



Monte Carlo Simulation to get a sense of the p-value of such successful intersections

```
In[•]:= (*SimulationResults={};
  simulatedgraphpoints=Table[RandomReal[{0,360},33],{i,1000000}];
  orb=5;
  For[i=1,i≤1000000,i++,
   randomvaluesforangles=RandomReal[{0,1},2];
   simulatedangles=
    Union[Join[Table[Mod[360*(1-randomvaluesforangles[[1]])+i*90,360],{i,0,3}],
      Table[Mod[180*(1-randomvaluesforangles[[1]])+i*90,360],{i,0,3}],
      Join[Table[Mod[360*(randomvaluesforangles[[1]])+i*90,360],{i,0,3}],
       Table[Mod[180*(randomvaluesforangles[[1]])+i*90,360],{i,0,3}]],
      Table[Mod[360*(randomvaluesforangles[[2]])+i*90,360],{i,0,3}],
      360-Table[Mod[360*(randomvaluesforangles[[2]])+i*90,360],{i,0,3}],r]];
   count=0;
   For[k=1,k≤33,k++,
    count1=0;
    For[j=1,j≤Length[simulatedangles],j++,
     If[Mod[Abs[simulatedgraphpoints[[i,k]]-simulatedangles[[j]]],360]≤orb||
       360-Mod[Abs[simulatedgraphpoints[[i,k]]-simulatedangles[[j]]],360]≤orb,count1=1]];
    count=count+count1;
   ];
   AppendTo[SimulationResults,count];
  ];*)

In[•]:= (*i*)

In[•]:= (*Dimensions[simulatedgraphpoints]*)

In[•]:= (*Length[simulatedangles]*)

In[•]:= (*Histogram[SimulationResults]*)

In[•]:= (*Count[SimulationResults,u_/;u≥30]*)

In[•]:= (*phat=N[13268/1000001]*)

In[•]:= (*Count[SimulationResults,u_/;u≥32]*)

In[•]:= (*Count[SimulationResults,u_/;u≥33]*)

In[•]:= (*phat=N[154/1000001]*)

In[•]:= (*NProbability[a≥33,a≈EmpiricalDistribution[SimulationResults]]*)

In[•]:= (*finsimulationdistribution=FindDistribution[SimulationResults]*)

In[•]:= (*NProbability[a≥33,a≈finsimulationdistribution]*)
```