NEWS PRESENCE OF ASTEROID NAMES RELATES TO ANGLES TO SPECIAL POINTS

-- COLLECTION STARTED ON FEB 15, 2022-- EVALUATED DAILY UNTIL DEC 1, 2023 --

```
(*Today's Date and Time of Collection & Reporting UTC*)Style[DateString[TimeZoneConvert[DateObject[Date[]], "UTC"]], "Subtitle"]
```

Sat 23 Sep 2023 23:48:12

```
SetDirectory["/home/rko/Documents/Wolfram Desktop/Asteroids1211"];(*use your own directory here*)
```

Collection of Data

```
sundata = Import["MinorPlanetSunData.csv"][[All ;; -2]];
```

Normalize and then average the daily article count across all individual minor planets

Extract Dates from Imported Data

```
(*dates=
  Table[DateObject[ToString[sundata[[2;;All,1]][[i]]]],{i,1,Length[sundata[[2;;All,1]]]}]//Quiet;*)

(*dates=
  Table[Interpreter["ComputedDateTime"][sundata[[2;;All,1]][[i]]<>" 12:00:00 pm London TimeZone"],{i,1,Length[sundata[[2;;All,1]]]}];*)

(*Export["noondates.m",dates]*)

dates = Import["noondates.m"];

Length[dates]
```

```
290
```

degrees-Sun -(SPECIALPOINT -Sun) = degrees - SPECIALPOINT

```
Now
```

```
Tue 26 Sep 2023 17:52:27 GMT-6
```

```
AstroAngularSeparation[Entity["Star", "Sun"], Moon PLANETARY MOON , Now]
```

```
146.014°
```

```
specialpoints = {firstpointofaries, sun, moon, mercury, venus, mars, jupiter, saturn, uranus, neptune, pluto};
specialpointsfiles = Table[ToString[specialpoints[[i]]] <> ".m", {i, Length[specialpoints]}]
specialpointsentities = {Mesarthim STAR , Sun STAR , Moon PLANETARY MOON , Mercury PLANET , Venus PLANET , Mars PLANET , Jupiter PLANET , Saturn PLANET , Uranus PLANET , Neptune PLANET , Pluto MINOR PLANET };
```

```
{firstpointofaries.m, sun.m, moon.m, mercury.m, venus.m, mars.m, jupiter.m, saturn.m, uranus.m, neptune.m, pluto.m}
```

```
{"firstpointofaries.m", "sun.m", "moon.m", "mercury.m", "venus.m", "mars.m", "jupiter.m", "saturn.m", "uranus.m", "neptune.m", "pluto.m"}
```

```
{firstpointofaries.m, sun.m, moon.m, mercury.m, venus.m, mars.m, jupiter.m, saturn.m, uranus.m, neptune.m, pluto.m}
```

```
(*For[j=1,j≤Length[specialpoints],j++,
  specialpoints[[j]]={};
  For[nowi=1,nowi≤290(*Length[do]*),nowi++,
   now=dates[[nowi]];
   AppendTo[specialpoints[[j]],QuantityMagnitude[AstroAngularSeparation[Entity["Star","Sun"],specialpointsentities[[j]],now]]];
  ];
  Export[specialpointsfiles[[j]],specialpoints[[j]]]
 ];*)
```

```
specialpoints = Table[Import[specialpointsfiles[[i]]], {i, Length[specialpoints]}];
```

```
mesarthimGEL = StarData[Mesarthim STAR , "GeocentricEclipticLongitude"]
```

```
33° 11' 2.×10^1"
```

```
StarData["Hamal", "GeocentricEclipticLongitude"]
```

```
37° 39.9'
```

```
StarData["Sheratan", "GeocentricEclipticLongitude"]
```

```
33° 58' 2.×10^1"
```

Mesarthim was chosen as it is (currently) the closest fixed star to Sidereal placement to the Sun at the point of the Vernal Equinox . It does move but very slowly over the course of thousands of years . All other fixed reference points (such as the first point of Aries, etc). should just represent a phase-shift to the Mesarthim data. As such, the Mesarthim analysis below for peak period and frequency identification, and so on applies equally to any fixed point of the zodiac.

Check whether dates are sampled regularly day by day and check number of dates

```
RegularlySampledQ[dates]
```

```
True
```

```
Length[dates]
```

```
290
```

Extract Article Counts and Angles of Namesakes to Special Points By Degree

```
toanalyse = sundata〚2 ;; All, 2 ;; All〛;

articles = Table[toanalyse〚All, i〛, {i, 1, Length[toanalyse〚1〛], 2}];

anglesdegstable = Table[Table[Mod[toanalyse〚All, i〛 - specialpoints〚j〛, 360], {i, 2, Length[toanalyse〚1〛], 2}], {j, Length[specialpoints]}];

Dimensions[anglesdegstable]
```

```
{11, 1211, 290}
```

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

```
articlesTS = Table[TimeSeries[articles〚i〛, {dates}], {i, 1, Length[articles]}];

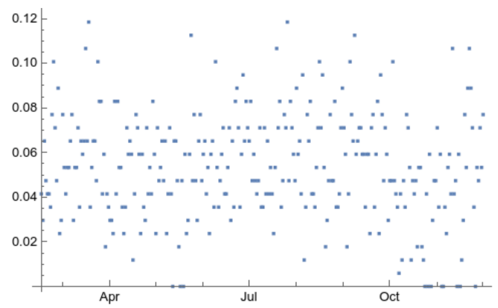
normarticlesTS = Table[Normalize[articlesTS〚i〛], {i, 1, Length[articlesTS]}];
```

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

```
normarticlesTS〚2〛
```

```
TimeSeries[ Time: 15 Feb 2022 to 01 Dec 2022
            Data points: 290 ]
```

```
ListPlot[%]
```



Similarly, Construct a Time Series for the Upper Angular Degrees to Each Special Point for Each Minor Planet

```
Length[specialpoints]
```

```
11
```

```
(*anglesTStable=Table[Table[TimeSeries[anglesdegstable⟦j,i⟧,{dates}],{i,1,290}],{j,Length[specialpoints]}];*)
```

```
(*Dimensions[anglesTStable]*)
```

```
Dimensions[anglesdegstable]
```

```
{11, 1211, 290}
```

```
justangles = Table[Flatten[Table[Mod[Ceiling[anglesdegstable⟦j, i⟧], 360], {i, 1, 1211}]], {j, Length[specialpoints]}];(*so degree within 0 to 1 would count as being at 1 degree,
29 to 30 would count as 30 degrees, because reportage of articles are read across following day,
lag of one etc.*)
```

```
Dimensions[justangles]
```

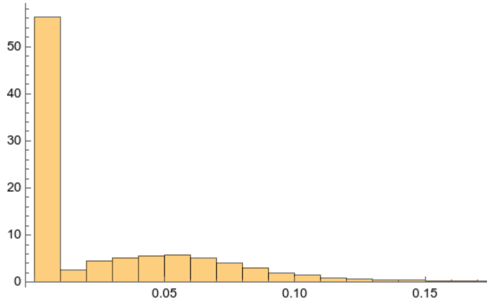
```
{11, 351 190}
```

```
justvalues = Flatten[Table[Values[normarticlesTS⟦i⟧], {i, Length[normarticlesTS]}]];
```

```
Length[justvalues]
```

```
351 190
```

```
Histogram[justvalues, Automatic, "ProbabilityDensity"](*a substantial number had no recorded articles for that name & day*)
```



Now, combine angles and article counts.

```
Dimensions[justangles]
```

```
{11, 351190}
```

```
justtable = Table[Transpose[{justangles[[j]], justvalues}], {j, Length[specialpoints]}];
```

```
Length[justtable[[1]]] (*this is the number of data points to date*)
```

```
351190
```

```
Length[dates] * Length[articles] (*confirmation of number of data points!*)
```

```
351190
```

Calculate the average normalized article count per upward degree.

```
valgrpbydegtable =
  Table[KeySort[GroupBy[N[justtable[[j]]], First → Last, Mean]], {j, Length[specialpoints]}];
```

```
Length[valgrpbydegtable[[1]]]
```

```
360
```

```
(*matable=Table[peaks=FindPeaks[MovingAverage[Values[valgrpbydegtable[[j]]],120]];ListLinePlot[{MovingAverage[Values[valgrpbydegtable[[j]]],10],peaks},
   Joined→{True,False},
   PlotStyle→{Automatic,PointSize[.03]},PlotLabel→"Moving Average Peaks for "<>CommonName[specialpointsentities[[j]]]<>"Special Point: "<>ToString[Length[peaks]],
   ImageSize→Large],{j,Length[specialpoints]}]*)
```

Filter data by applying the Wiener filter (of range 1 and fixed padding) to remove noise.

```
datatable = Table[WienerFilter[Values[valgrpbydegtable[[j]]], 1], {j, Length[specialpoints]}];

Dimensions[datatable]

{11, 360}

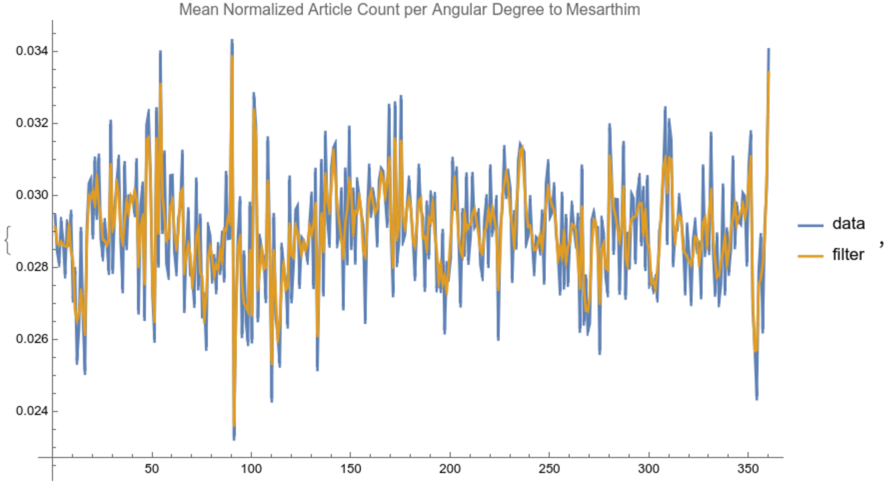
(*Export["datatable_v1.m",datatable]*)

datatable_v1.m

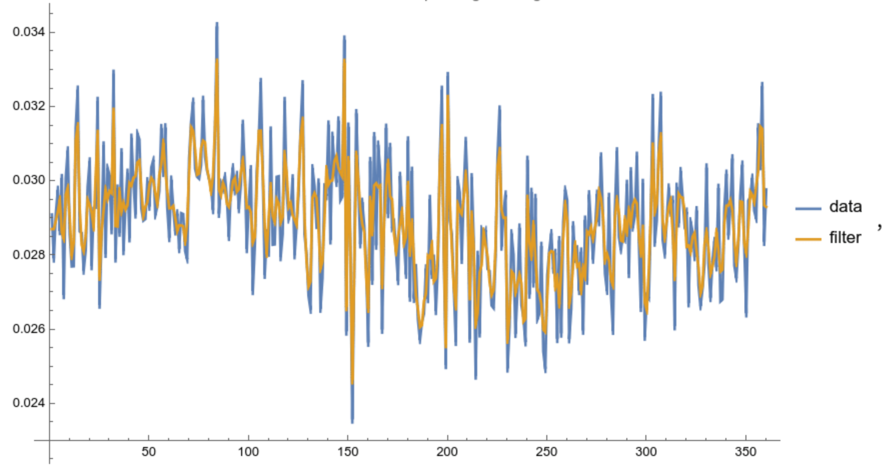
datatable = Import["datatable_v1.m"];

wftable = Table[ListLinePlot[{Values[valgrpbydegtable[[i]]], datatable[[i]]}, Filling → {2 → {1}}, PlotLegends → {"data", "filter"},
   PlotLabel → "Mean Normalized Article Count per Angular Degree to " <> CommonName[specialpointsentities[[i]]], ImageSize → Large(*,AxesLabel→{"Degree","Mean"}*)], {i, 11}]
```

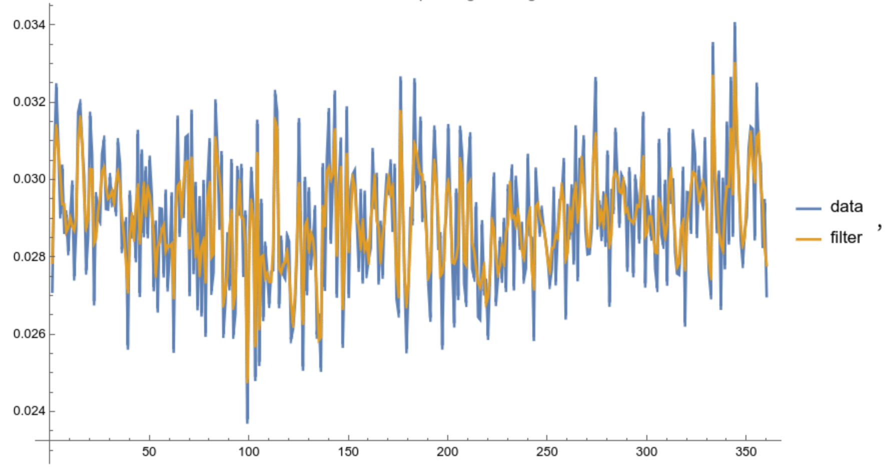
Mean Normalized Article Count per Angular Degree to Mesarthim



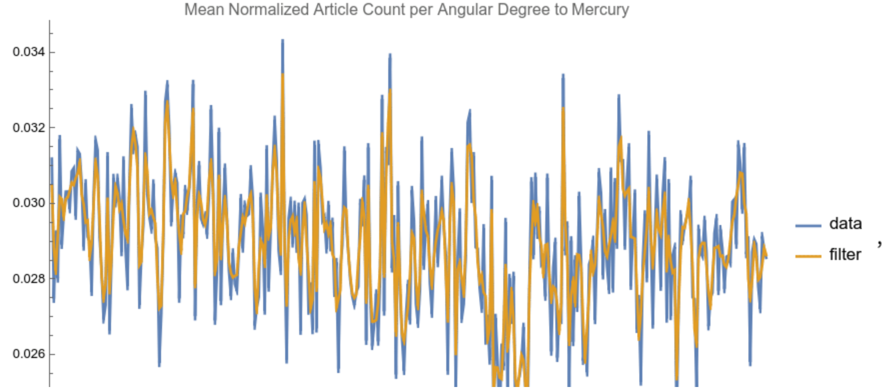
Mean Normalized Article Count per Angular Degree to Sun



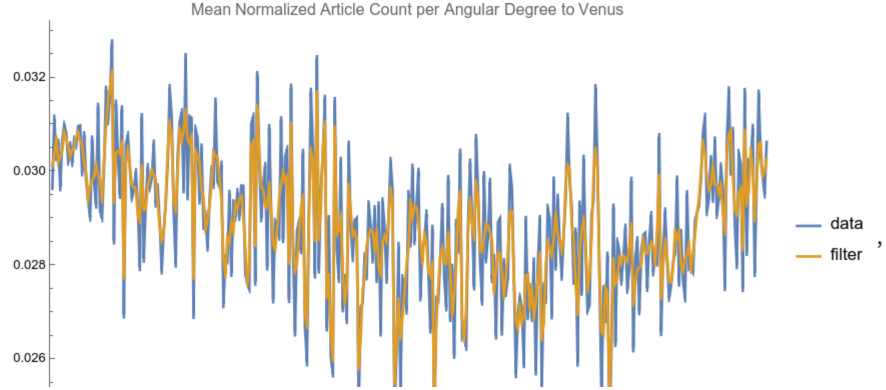
Mean Normalized Article Count per Angular Degree to Moon

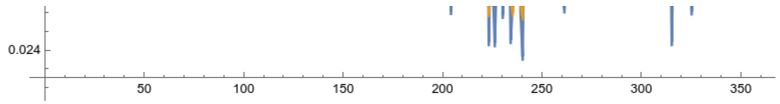


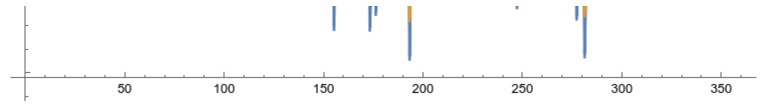
Mean Normalized Article Count per Angular Degree to Mercury



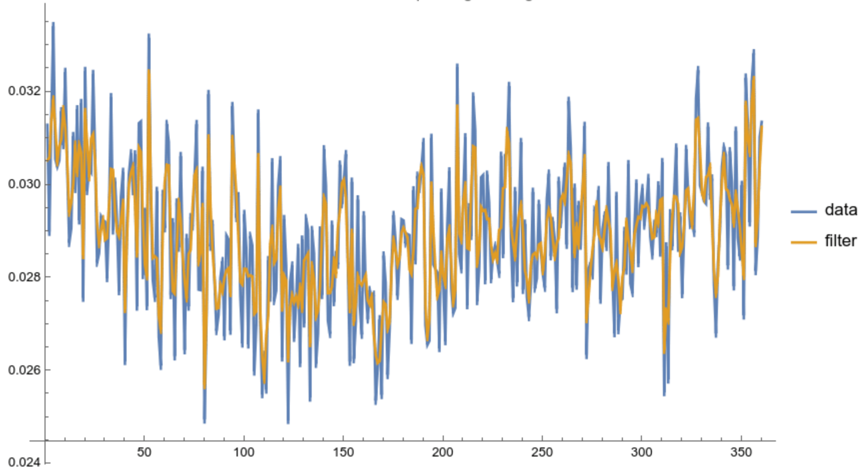
Mean Normalized Article Count per Angular Degree to Venus



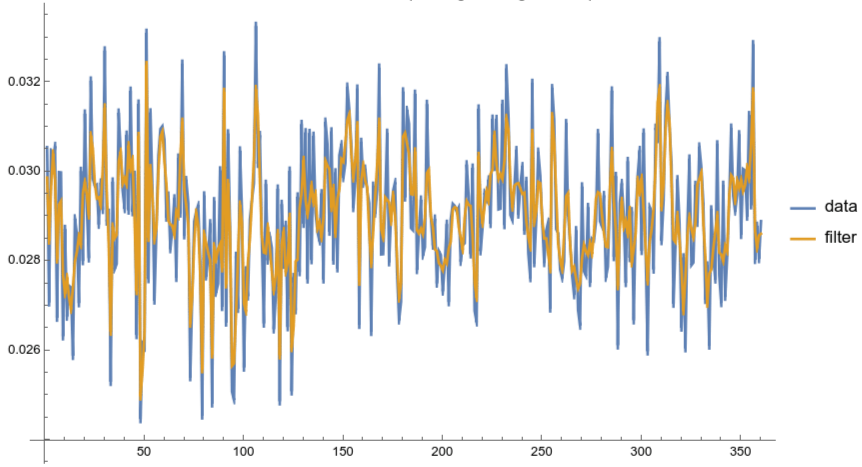




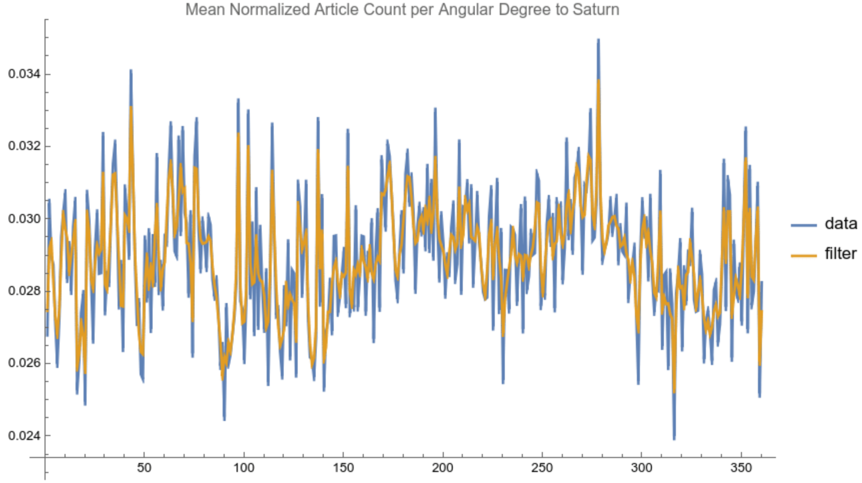
Mean Normalized Article Count per Angular Degree to Mars



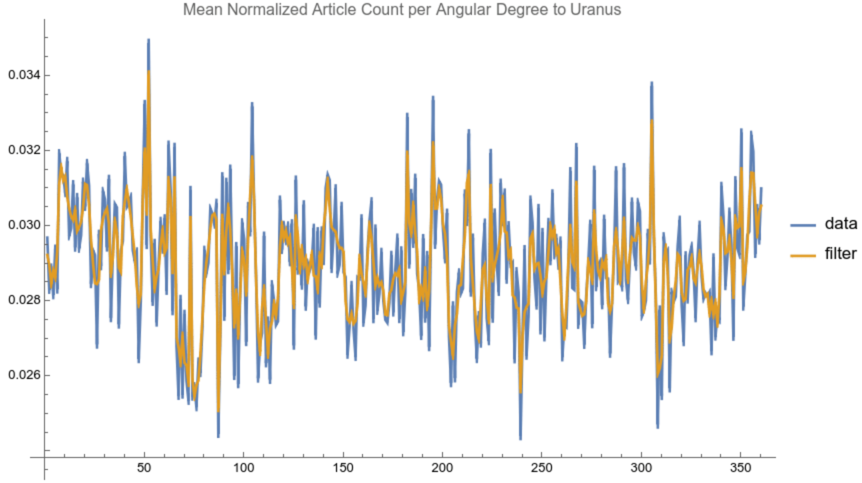
Mean Normalized Article Count per Angular Degree to Jupiter



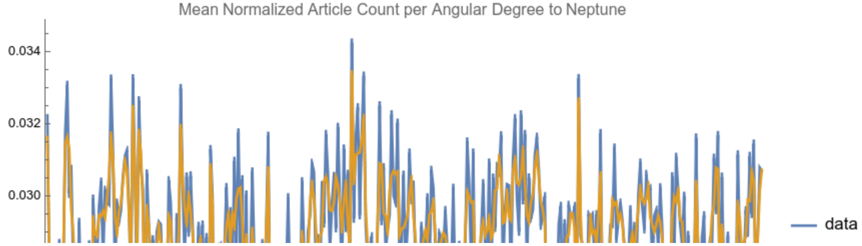
Mean Normalized Article Count per Angular Degree to Saturn



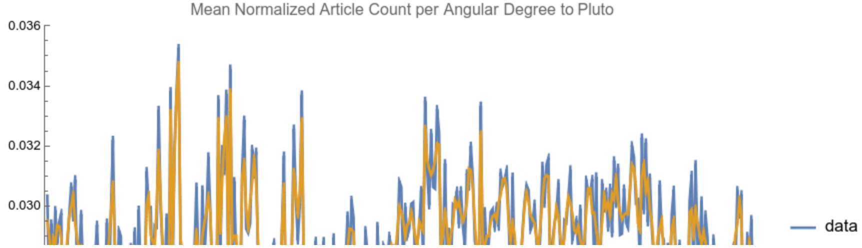
Mean Normalized Article Count per Angular Degree to Uranus

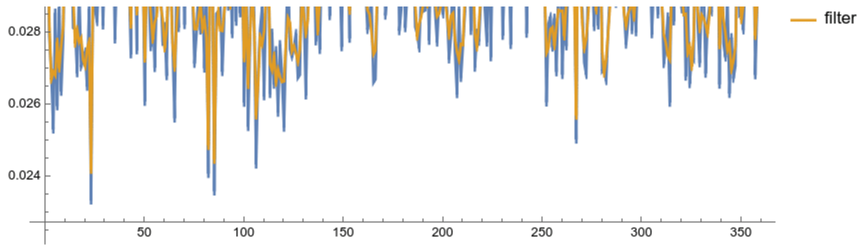


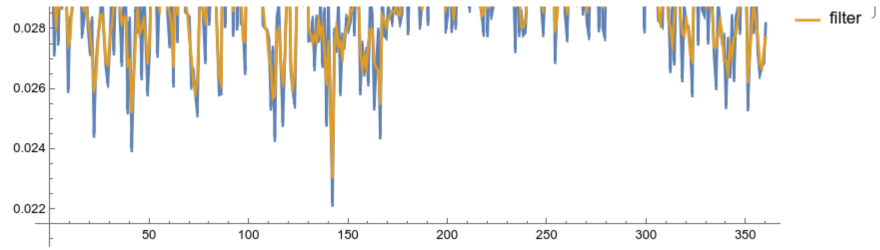
Mean Normalized Article Count per Angular Degree to Neptune



Mean Normalized Article Count per Angular Degree to Pluto





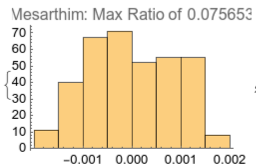


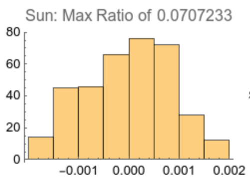

```
(*Table[Export["wienerfilter"<>CommonName[specialpointsentities[[i]]]<>".png",wftable[[i]]],{i,11}]*)
```

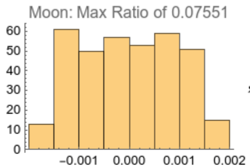
Look at the residuals.

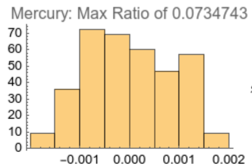
```
residuals = Table[Rest[datatable[[i]] - Values[valgrpbydegtable[[i]]]], {i, Length[datatable]}];
```

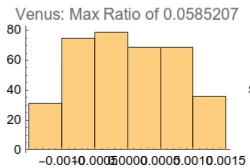
```
Table[Histogram[residuals[[i]], PlotLabel → CommonName[specialpointsentities[[i]]] <> ": Max Ratio of " <> ToString[Max[Abs[residuals[[i]]]] / Min[Abs[datatable[[i]]]]]],
 {i, 1, Length[residuals]}]
```

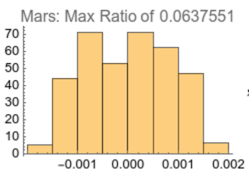


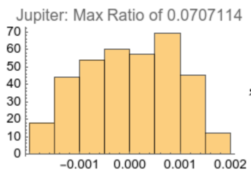


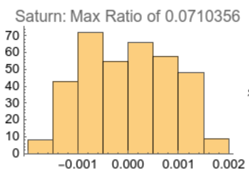


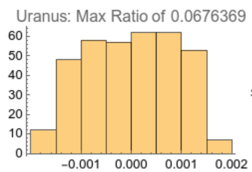


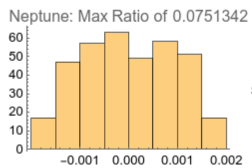


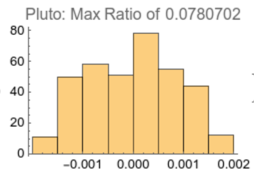













```
Table[AutocorrelationTest[residuals[[i]]], {i, 1, Length[residuals]}]
```

$\{1.72842\times10^{-36}, 3.48888\times10^{-27}, 1.39948\times10^{-42}, 5.93682\times10^{-33}, 5.99768\times10^{-32}, 1.44424\times10^{-30}, 5.75139\times10^{-42}, 1.1043\times10^{-32}, 4.27523\times10^{-39}, 1.057\times10^{-37}, 1.27227\times10^{-32}\}$

```
Table[DistributionFitTest[residuals[[i]]], {i, 1, Length[residuals]}]
```

$\{7.07795\times10^{-6}, 0.00158574, 1.81256\times10^{-7}, 0.0000448705, 0.0000396697, 3.72438\times10^{-6}, 5.10201\times10^{-6}, 0.0000269898, 2.22918\times10^{-6}, 3.74964\times10^{-6}, 0.0000370844\}$

Assumptions : Homoscedasticity : The variance of the time series should be constant over time . Normally Distributed Residuals : While this is not a strict requirement, if the residuals of the model are not approximately normally distributed, the p - values associated with the Ljung - Box statistic might not be accurate .

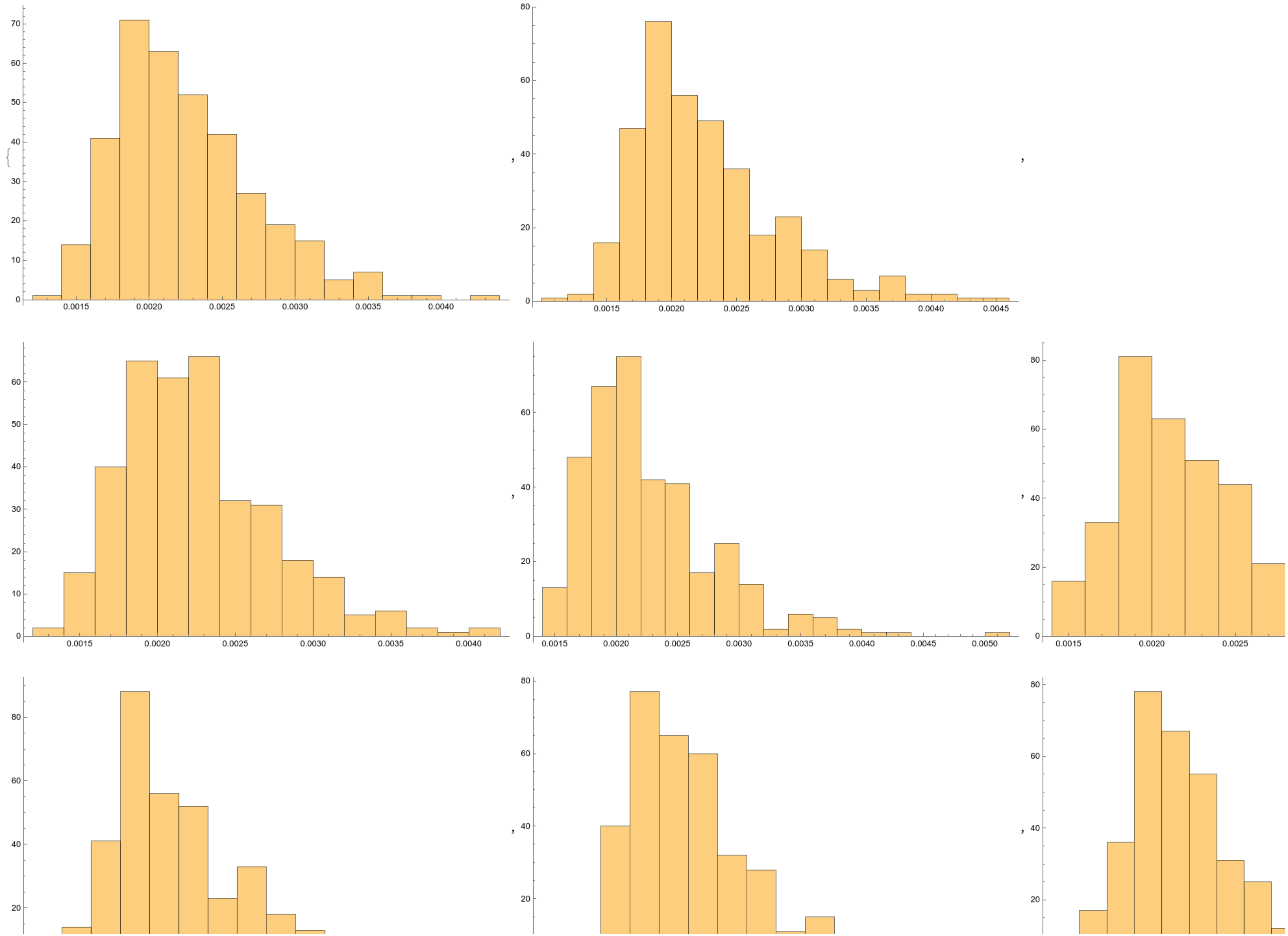
```
Values[valgrpbydegtable[[1, 1]]]
```

``` Values: The argument 0.029461288147555352` is not a valid Association or a list of rules.

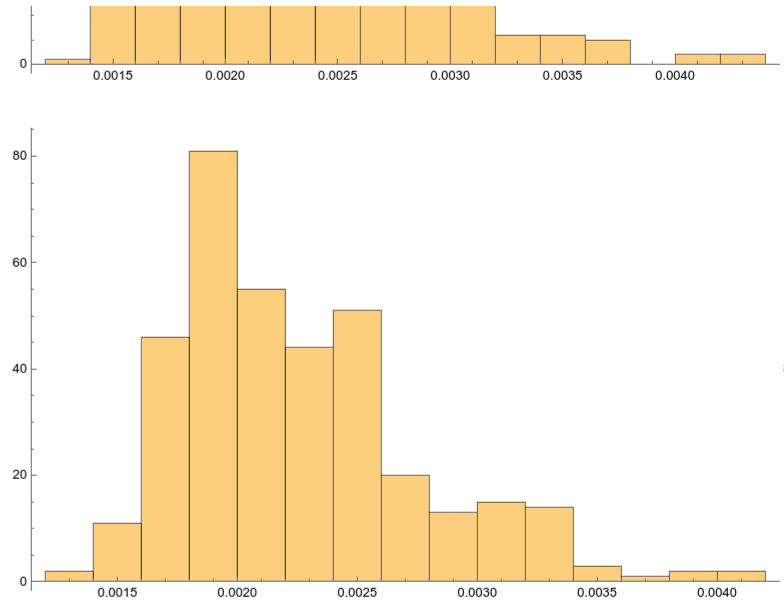
```
Values[0.0294613]
```

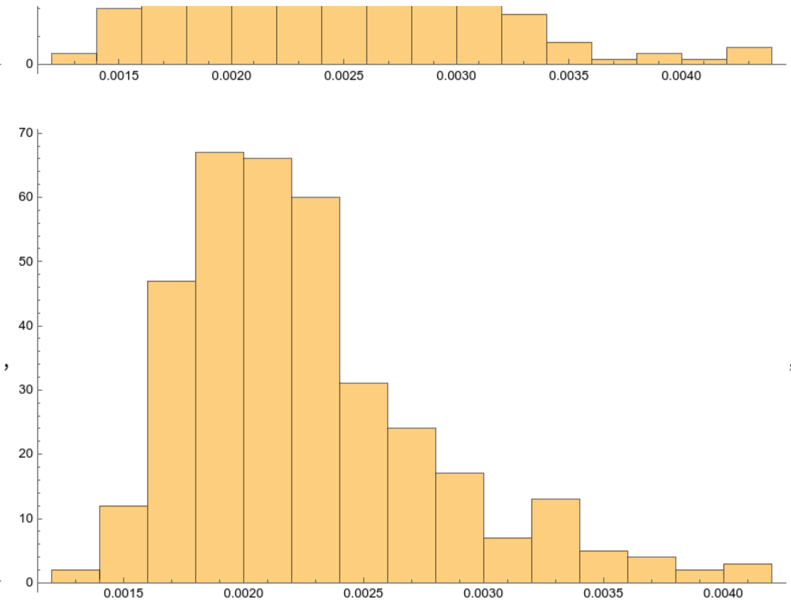
```
variances = Table[KeySort[GroupBy[N[justtable[[j]]], First → Last, Variance]], {j, Length[specialpoints]}];
```

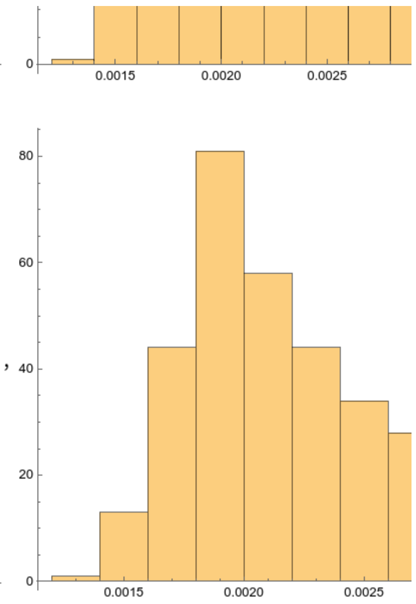
```
Table[Histogram[variances[[i]], ImageSize → Large], {i, 11}]
```
```



0 10 20 30 40 50 60 70
0.0015 0.0020 0.0025 0.0030 0.0035 0.0040
0 20 40 60 80
0.0015 0.0020 0.0025 0.0030 0.0035 0.0040 0.0045
0 10 20 30 40 50 60
0.0015 0.0020 0.0025 0.0030 0.0035 0.0040
0 20 40 60
0.0015 0.0020 0.0025 0.0030 0.0035 0.0040 0.0045 0.0050
0 20 40 60 80
0.0015 0.0020 0.0025
20 40 60 80
20 40 60 80
20 40 60 80



,


,


Test for randomness in filtered data

For a significance level of 0.05, the upper value for family-wise p-value test for significance is 0.01/22 or 0.002272727. That far exceeds by many orders of magnitude all the p-values below.

```
TableForm[
 Transpose[{CommonName[specialpointsentities], Table[AutocorrelationTest[datatable[[i]], Automatic, "HypothesisTestData"]["TestStatisticTable", "PValue"] ,
    {i, Length[specialpoints]}]}]](*TEST WHETHER NOT RANDOM: values less than 0.05 are generally understood to be associated with non-random data*)
```

Mesarthim
Statistic
Ljung-Box 111.974
7.86628*10^^-22
Sun
Statistic
Ljung-Box 280.633
1.1501*10^^-57
Moon
Statistic
Ljung-Box 114.471
2.3572*10^^-22
Mercury
Statistic
Ljung-Box 289.373
1.54657*10^^-59
Venus
Statistic
Ljung-Box 541.224
1.10073*10^^-113
Mars
Statistic

	Ljung-Box	338.364
	4.85371*10^^-70	
Jupiter		Statistic
	Ljung-Box	163.745
	9.52852*10^^-33	
Saturn		Statistic
	Ljung-Box	280.556
	1.19454*10^^-57	
Uranus		Statistic
	Ljung-Box	241.284
	2.98518*10^^-49	
Neptune		Statistic
	Ljung-Box	206.406
	8.20935*10^^-42	
Pluto		Statistic
	Ljung-Box	320.99
	2.58909*10^^-66	

Test for stationarity (cyclicity) in filtered data with accounting for an underlying nonzero mean

```
TableForm[Transpose[{CommonName[specialpointsentities], Table[TimeSeriesModelFit[datatable[[i]], "GARCH"]["BestFitParameters"], {i, Length[specialpoints]}]}]]
```

Mesarthim	0.168991
	0.14609
Sun	0.187699
	0.146063
Moon	0.16942
	0.144957
Mercury	0.209047
	0.145885
Venus	0.19487
	0.147812
Mars	0.187316
	0.146238
Jupiter	0.174484
	0.145994
Saturn	0.196982
	0.145856
Uranus	0.193661
	0.145826
Neptune	0.183616
	0.146407
Pluto	0.45969
	0.163797

```
TableForm[Transpose[{CommonName[specialpointsentities], Table[WeakStationarity[Normal[TimeSeriesModelFit[datatable[[i]], "GARCH"]]] , {i, Length[specialpoints]}]}]]
```

Mesarthim	True
Sun	True
Moon	True
Mercury	True
Venus	True
Mars	True
Jupiter	True
Saturn	True
Uranus	True
Neptune	True
Pluto	True

```
TableForm[
 Transpose[{CommonName[specialpointsentities], Table[UnitRootTest[datatable[[i]], "Constant", "HypothesisTestData"]["TestStatisticTable", "PValue"] , {i, Length[specialpoints]}]}]]
 (*TEST WHETHER UNIT
 ROOT: values greater than 0.05 are generally understood to HAVE A UNIT ROOT i.e. are non stationary so these data are all likely to be at least weakly stationary,
i.e. cyclic*)
```

Mesarthim

	Statistic
Dickey-Fuller F	-187.999

9.49505*10^^-12

Sun

	Statistic
Dickey-Fuller F	-142.285

1.48263*10^^-10

Moon

	Statistic
Dickey-Fuller F	-178.753

1.56116*10^^-11

Mercury

	Statistic
Dickey-Fuller F	-122.589

6.45372*10^^-10

Venus

	Statistic
Dickey-Fuller F	-106.273

2.64559*10^^-9

Mars

	Statistic
Dickey-Fuller F	-123.653

5.92611*10^^-10

Jupiter

	Statistic
Dickey-Fuller F	-163.365

3.79329*10^^-11

Saturn

	Statistic
Dickey-Fuller F	-130.008

3.61301*10^^-10

Uranus

	Statistic
Dickey-Fuller F	-122.162

6.68008*10^^-10

Neptune

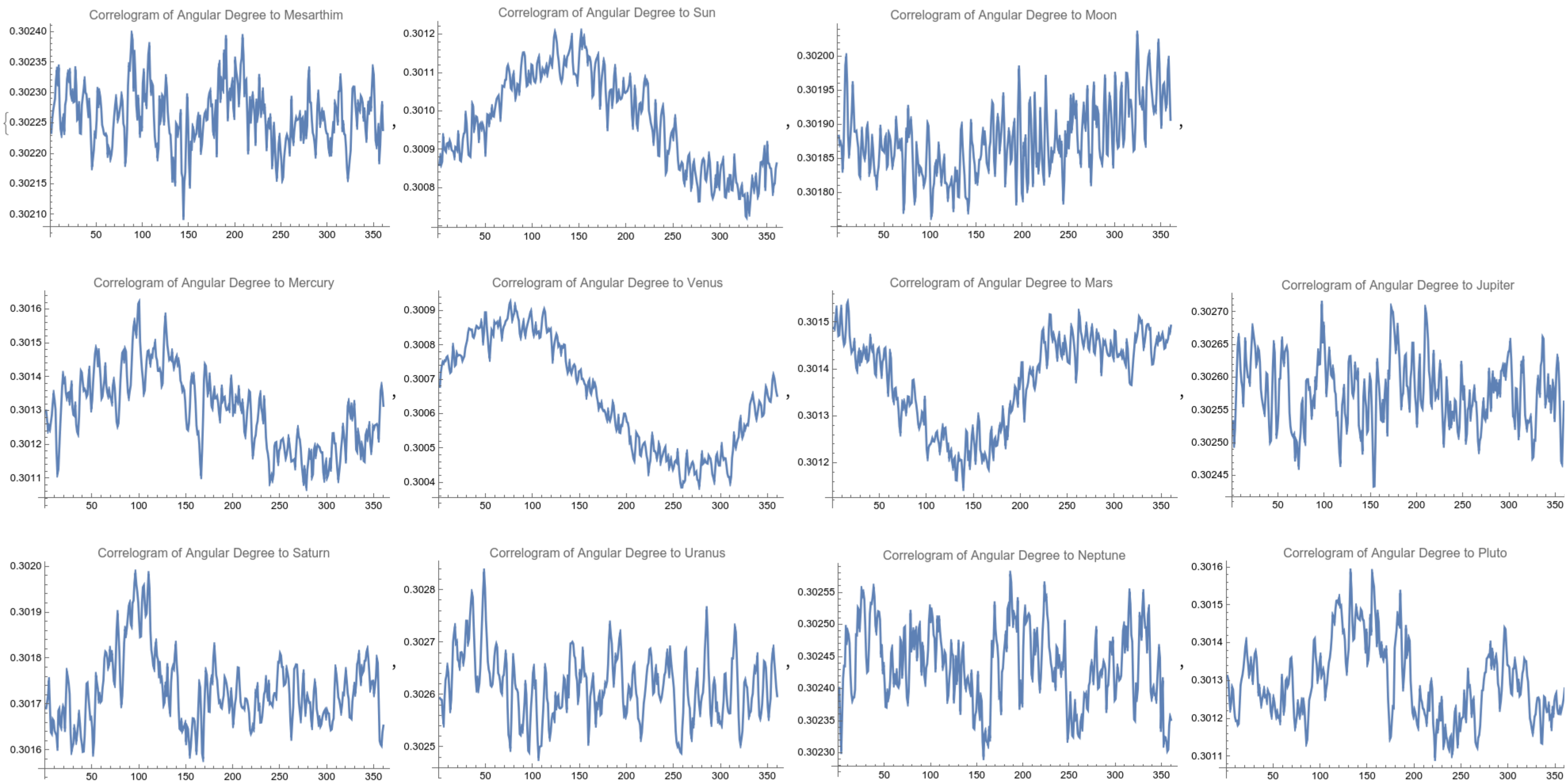
	Statistic
Dickey-Fuller F	-159.595
	4.7757*10^^-11

Pluto

	Statistic
Dickey-Fuller F	-124.408
	5.5805*10^^-10

Look at correlograms of filtered data to find hidden rhythms.

```
corrtable = Table[ListLinePlot[ListConvolve[datatable[[j]], datatable[[j]], {1, 1}], PlotLabel → "Correlogram of Angular Degree to " <> CommonName[specialpointsentities[[j]]],
  ImageSize → Medium], {j, Length[specialpointsentities]}] (*SAME AS CORRELOGRAM*) (*SUN MERCURY VENUS ARE MOST CLEAN RELATIVE SINUSOIDS VISUALLY*)
```

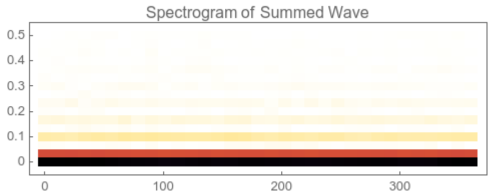


```
(*Table[Export["correlogram"<>CommonName[specialpointsentities[[i]]]<>".png",corrtable[[i]]],{i,11}]*)
```

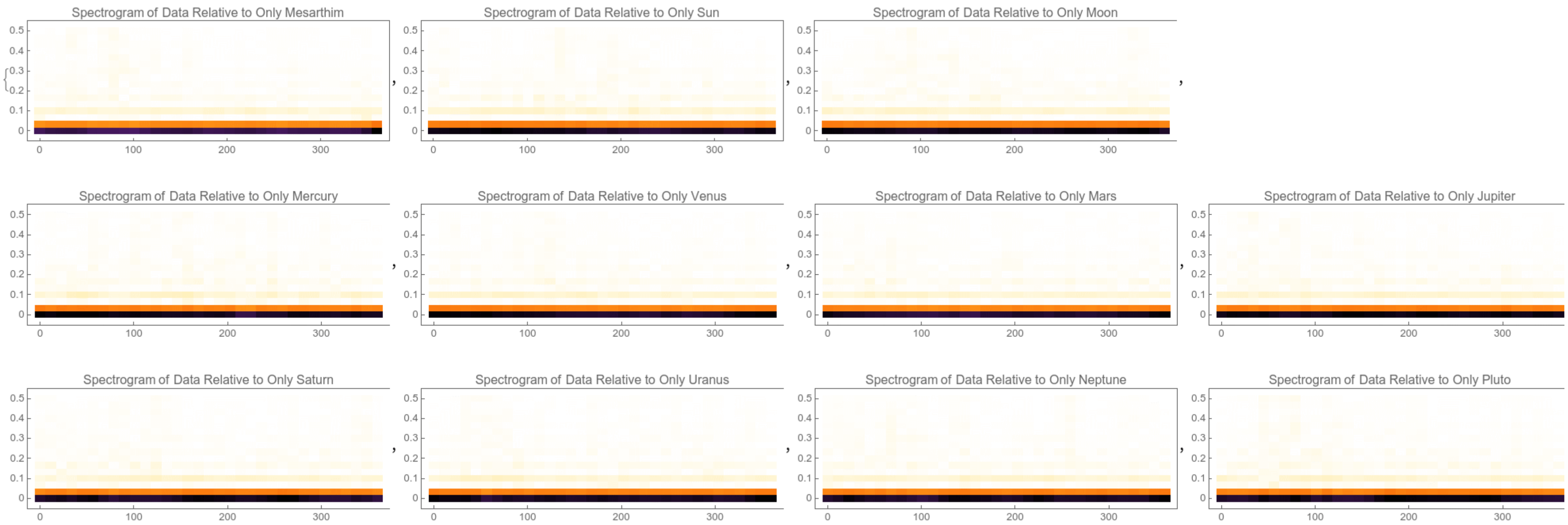
Look at spectrograms of filtered data.

```
sumtable = Total[datatable[[2 ;; All]]];

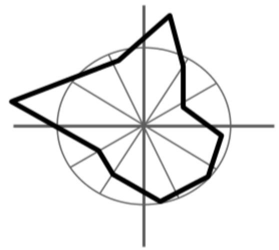
Spectrogram[sumtable, PlotLabel → "Spectrogram of Summed Wave"(*,PlotRange→{0,0.4}*)]
```




```
Table[Spectrogram[datatable[[i]], PlotLabel → "Spectrogram of Data Relative to Only " <> CommonName[specialpointsentities[[i]]], ImageSize → Medium(*,PlotRange→{0,0.2}*)], {i, 11}]
```



Gauquelin sectors have peaks in the 9th and 12th sectors out of 12, at approximately 260 degrees and 345 degrees.



en. wikipedia org/wiki/Astrological_aspect

```
phi = 0.618034
gc1 = Table[Mod[360 (1 - phi) + i * 90, 360], {i, 4}]
gc3 = Table[Mod[360 phi + i * 90, 360], {i, 4}]
g3 = Table[Mod[360 * (phi - (1 - phi)) + i * 90, 360], {i, 4}]
oct = Table[Mod[360 * (1 - (phi - (1 - phi))) + i * 90, 360], {i, 4}]
```

```
0.618034

{227.508, 317.508, 47.5078, 137.508}

{312.492, 42.4922, 132.492, 222.492}

{174.984, 264.984, 354.984, 84.9845}

{5.01552, 95.0155, 185.016, 275.016}
```

```
gc1
```

```
{227.508, 317.508, 47.5078, 137.508}
```

```
Divisors[Round[gc1]]
```

```
{{1, 2, 3, 4, 6, 12, 19, 38, 57, 76, 114, 228}, {1, 2, 3, 6, 53, 106, 159, 318}, {1, 2, 3, 4, 6, 8, 12, 16, 24, 48}, {1, 2, 3, 6, 23, 46, 69, 138}}
```

```
N[360 / Divisors[Round[gc1]]]
```

```
{{360., 180., 120., 90., 60., 30., 18.9474, 9.47368, 6.31579, 4.73684, 3.15789, 1.57895}, {360., 180., 120., 60., 6.79245, 3.39623, 2.26415, 1.13208},
 {360., 180., 120., 90., 60., 45., 30., 22.5, 15., 7.5}, {360., 180., 120., 60., 15.6522, 7.82609, 5.21739, 2.6087}}
```

```
gc3
```

```
{312.492, 42.4922, 132.492, 222.492}
```

```
Divisors[Round[gc3]]

{{1, 2, 3, 4, 6, 8, 12, 13, 24, 26, 39, 52, 78, 104, 156, 312}, {1, 2, 3, 6, 7, 14, 21, 42}, {1, 2, 3, 4, 6, 11, 12, 22, 33, 44, 66, 132}, {1, 2, 3, 6, 37, 74, 111, 222}}

N[360 / Divisors[Round[gc3]]]

{{360., 180., 120., 90., 60., 45., 30., 27.6923, 15., 13.8462, 9.23077, 6.92308, 4.61538, 3.46154, 2.30769, 1.15385}, {360., 180., 120., 60., 51.4286, 25.7143, 17.1429, 8.57143},
 {360., 180., 120., 90., 60., 32.7273, 30., 16.3636, 10.9091, 8.18182, 5.45455, 2.72727}, {360., 180., 120., 60., 9.72973, 4.86486, 3.24324, 1.62162}}

g3

{174.984, 264.984, 354.984, 84.9845}

Divisors[Round[g3]]

{{1, 5, 7, 25, 35, 175}, {1, 5, 53, 265}, {1, 5, 71, 355}, {1, 5, 17, 85}}

N[360 / Divisors[Round[g3]]]

{{360., 72., 51.4286, 14.4, 10.2857, 2.05714}, {360., 72., 6.79245, 1.35849}, {360., 72., 5.07042, 1.01408}, {360., 72., 21.1765, 4.23529}}

oct

{5.01552, 95.0155, 185.016, 275.016}

Divisors[Round[oct]]

{{1, 5}, {1, 5, 19, 95}, {1, 5, 37, 185}, {1, 5, 11, 25, 55, 275}}

N[360 / Divisors[Round[oct]]]

{{360., 72.}, {360., 72., 18.9474, 3.78947}, {360., 72., 9.72973, 1.94595}, {360., 72., 32.7273, 14.4, 6.54545, 1.30909}}

astropds = N[360 * Mod[{1 / 1, 1 / 2, 1 / 3, 1 / 4, 1 / 8, 1 / 16, 1 / 6, 1 / 12, 1 / 24, 1 / 5, 1 / 15, 1 / 20, 1 / 40, 1 / 7, 1 / 14, 1 / 9, 1 / 18, 1 / 36, 1 / 11, 1 / 8, 1 / 10}, 360]]

{360., 180., 120., 90., 45., 22.5, 60., 30., 15., 72., 24., 18., 9., 51.4286, 25.7143, 40., 20., 10., 32.7273, 45., 36.}

Union[N[Flatten[Join[Union[astropds], Divisors[Round[gc1]], Divisors[Round[gc3]], Divisors[Round[g3]], Divisors[Round[oct]]]]]]

{1., 2., 3., 4., 5., 6., 7., 8., 9., 10., 11., 12., 13., 14., 15., 16., 17., 18., 19., 20., 21., 22., 22.5, 23., 24., 25., 25.7143,
 26., 30., 32.7273, 33., 35., 36., 37., 38., 39., 40., 42., 44., 45., 46., 48., 51.4286, 52., 53., 55., 57., 60., 66., 69., 71., 72., 74., 76.,
 78., 85., 90., 95., 104., 106., 111., 114., 120., 132., 138., 156., 159., 175., 180., 185., 222., 228., 265., 275., 312., 318., 355., 360.}

Length[%]
```

```
astrofreq =
 Union[
  Round[
   Mod[Flatten[1/{1/1, 1/2, 1/3, 1/4, 1/8, 1/16, 1/6, 1/12, 1/24, 1/5, 1/15, 1/20, 1/40, 1/7, 1/14, 1/9, 1/18, 1/36, 1/11, 1/8, 1/10,
       1/Divisors[Round[gc1]], 1/Divisors[Round[gc3]], 1/Divisors[Round[g3]], 1/Divisors[Round[oct]]}], 360]]]
```

```
{1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19, 20, 21, 22, 23, 24, 25, 26, 33, 35, 36, 37, 38, 39, 40, 42,
 44, 46, 48, 52, 53, 55, 57, 66, 69, 71, 74, 76, 78, 85, 95, 104, 106, 111, 114, 132, 138, 156, 159, 175, 185, 222, 228, 265, 275, 312, 318, 355}
```

```
Length[astrofreq]
```

```
66
```

```
(*Table[ListPlot[Total[Table[0.5+0.5Sin[(Flatten[astrofreq][[i]])*x Degree+90Degree],{i,Length[Flatten[astrofreq]]-j},{x,1,360}]],PlotRange→All],
 {j,0,Length[Flatten[astrofreq]]-5}]*)
```

```
N[Flatten[360 Mod[{1/1, 1/2, 1/3, 1/4, 1/8, 1/16, 1/6, 1/12, 1/24, 1/5, 1/15, 1/20, 1/40, 1/7, 1/14, 1/9, 1/18, 1/36, 1/11, 1/8, 1/10}, 360]]]
```

```
{360., 180., 120., 90., 45., 22.5, 60., 30., 15., 72., 24., 18., 9., 51.4286, 25.7143, 40., 20., 10., 32.7273, 45., 36.}
```

```
astropds =
 N[
  Union[
   Flatten[360 Mod[{1/1, 1/2, 1/3, 1/4, 1/8, 1/16, 1/6, 1/12, 1/24, 1/5, 1/15, 1/20, 1/40, 1/7, 1/14, 1/9, 1/18, 1/36, 1/11, 1/8, 1/10,
       1/Divisors[Round[gc1]], 1/Divisors[Round[gc3]], 1/Divisors[Round[g3]], 1/Divisors[Round[oct]]}, 360]]]]
```

```
{1.01408, 1.13208, 1.15385, 1.30909, 1.35849, 1.57895, 1.62162, 1.94595, 2.05714, 2.26415, 2.30769, 2.6087, 2.72727, 3.15789, 3.24324, 3.39623, 3.46154, 3.78947, 4.23529, 4.61538,
 4.73684, 4.86486, 5.07042, 5.21739, 5.45455, 6.31579, 6.54545, 6.79245, 6.92308, 7.5, 7.82609, 8.18182, 8.57143, 9., 9.23077, 9.47368, 9.72973, 10., 10.2857, 10.9091,
 13.8462, 14.4, 15., 15.6522, 16.3636, 17.1429, 18., 18.9474, 20., 21.1765, 22.5, 24., 25.7143, 27.6923, 30., 32.7273, 36., 40., 45., 51.4286, 60., 72., 90., 120., 180., 360.}
```

Note that Fourier Transforms of filtered data show frequency peaks, the periods of which match the divisors of major astrological angles (trines, squares, quintiles, deciles, Golden angles).

Reconstitute signals in the summed MAJOR planet data to start of Aries via Mesarthim.

```
datatable = Import["datatable_v1.m"];
```

```
sumtable = Total[datatable[[2 ;; All]]];
```

```
samplingRate = 360;
t = sumtable - 10 datatable[[1]];

(*Compute the DFT*)
dft = Fourier[t];

length = Length[t];
frequencies = Range[1, length] * (samplingRate / length);

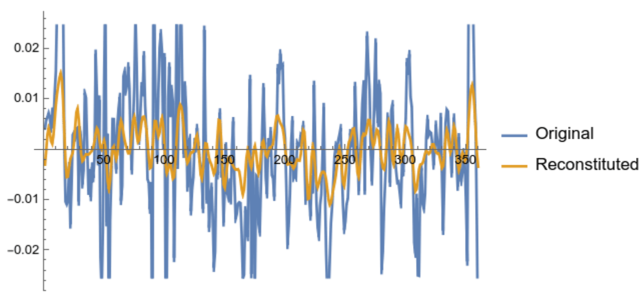
threshold = 1;
peakIndices = Flatten[Position[Abs[dft], _?(# > 0.02 &)]];
peakIndices = Cases[peakIndices, _?(# ≤ 180 &)];

peakFrequencies = frequencies[[peakIndices]];
peakAmplitudes = Abs[dft[[peakIndices]]];
peakPeriods = N[360 / peakFrequencies];
peakPhases = Arg[dft[[peakIndices]]];

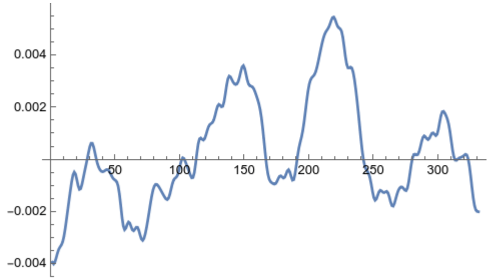
(*Zero out non-peak frequencies*)
modifiedDFT = ConstantArray[0 + 0 I, Length[dft]];
modifiedDFT[[peakIndices]] = dft[[peakIndices]];

(*Use InverseFourier to reconstruct the signal*)
reconstitutedWave = Re[InverseFourier[modifiedDFT]];

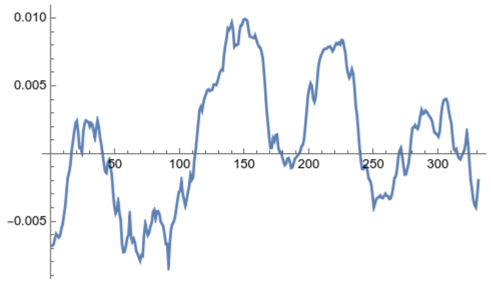
(*Plot the original and reconstituted waves*)
ListLinePlot[{t, reconstitutedWave}, PlotLegends → {"Original", "Reconstituted"}]
```




```
ListLinePlot[MovingAverage[-reconstitutedWave, 30]]
```



```
ListLinePlot[MovingAverage[-t, 30]]
```



(Minor Planets - Major Planets) - (Minor Planets -Mesarthim) = - Major Planets + Mesarthim = - (Major Planets - Mesarthim) = -(Sum of MAJOR Planets to zero degrees of the zodiac) + 10*mesarthimGEL , so the focus here is on houses, ie the angular degrees of MAJOR planets to zero degrees Aries minus a constant. Rotating the resulting graph to account for this constant, i.e., the phase shift of Mesarthim x 1/10, the Gauquelin image is reproduced. Appropriately substituting in the sidereal placement just changes that constant, and the same net graph is reproduced which is a great confirmation.

```
mesarthimGEL = QuantityMagnitude[UnitConvert[StarData[Mesarthim STAR, "GeocentricEclipticLongitude"], "Degrees"]] (*http://stars.astro.illinois.edu/sow/mesarthim.html*)

33.188

vernalequinox2022 =
 QuantityMagnitude[
  UnitConvert[
   StarData["Sun", EntityProperty["Star", "GeocentricEclipticLongitude",
     {"Date" → DateObject[{2022, 3, 20, 11, 33}, TimeZone → LocalTimeZone[Richmond CITY, DateObject[{2022, 3, 20, 11, 33}]]], "Location" → Richmond CITY}]], "Degrees"]]
 (*the Sun is at zero degrees at Spring Equinox of 2022.*)

0.00040925

Mod[0.1 mesarthimGEL * 1211, 360]

59.0488

ClearAll[ayanamsha]
```

```
getAyanamsha = NSolve[Mod[0.1 * (mesarthimGEL - ayanamsha) * 1211., 360.] == Mod[0.1 * mesarthimGEL * 1211., 360.] && ayanamsha > 23. && ayanamsha < 30., {ayanamsha}, Reals]
 (*Exact match for Lahiri ayanamsha of 2022, the year of our collection*)

{{ayanamsha → 23.782}, {ayanamsha → 26.7547}, {ayanamsha → 29.7275}}

ayanamsha = Values[getAyanamsha[[-3]]][[1]]

23.782

fixeddate = DateObject[{2022, 6, 25}, TimeZone → "UTC"];
T = DateDifference[DateObject[{2000, 1, 1, 11, 58.816}, TimeZone → "UTC"], fixeddate] / Quantity[36 525, "Days"];
delta = UnitConvert[Quantity[5028.796195 * T + 1.1054348 * T ^ 2, "ArcSeconds"], "Degrees"];
ayanamActual = QuantityMagnitude[Quantity[23.439291111, "Degrees"] + delta];

delta

0.314024°

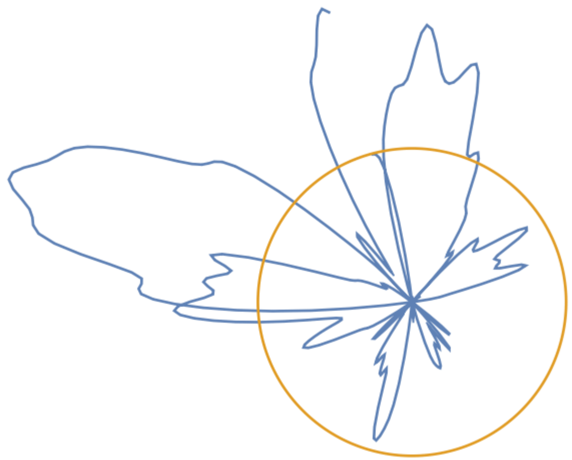
ayanamActual

23.7533

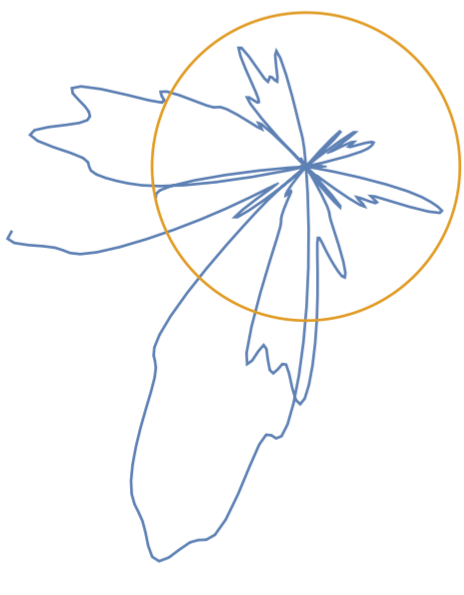
(ayanamsha - ayanamActual) / ayanamActual

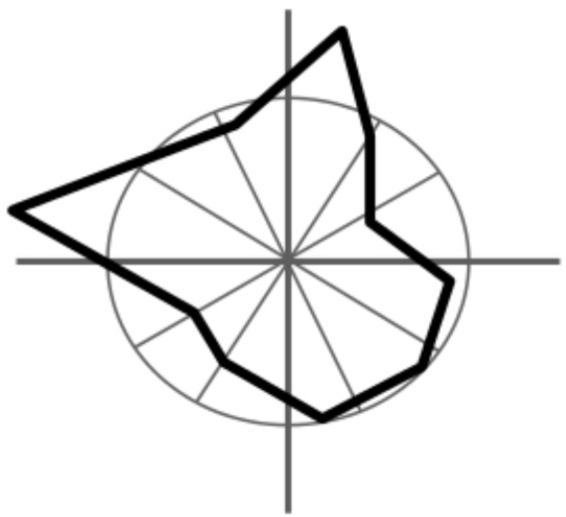
0.00120873

Rotate[Rotate[ListPolarPlot[{MovingAverage[reconstitutedWave, 30], ConstantArray[0.002, 360]}, PlotRange → All, Joined → {True, True}, Axes → False],
  - (0.1 mesarthimGEL * 1211) Degree], (180 - 15) Degree] (*shirt logo for mahat.io*)
(*Tropical*)
```

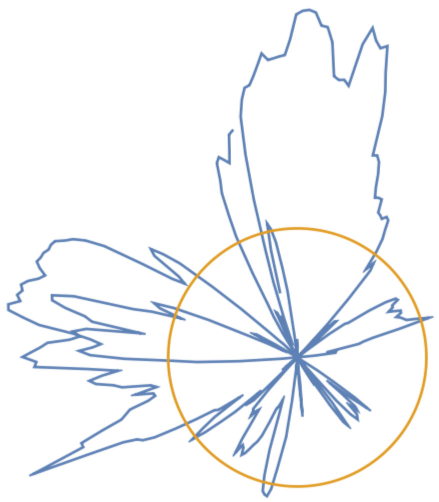


```
Rotate[Rotate[ListPolarPlot[{MovingAverage[reconstitutedWave, 30], ConstantArray[0.002, 360]}, PlotRange → All, Joined → {True, True}, Axes → False],
  - (0.1 (mesarthimGEL - ayanamActual) * 1211) Degree], (180 - 15) Degree] (*Sidereal*)
(*MATCHES (as it should)!*)
```





```
Rotate[Rotate[ListPolarPlot[{MovingAverage[t, 30], ConstantArray[0.0037, 360]}, PlotRange → All, Joined → {True, True}, Axes → False], -(0.1 mesarthimGEL * 1211) Degree],
 (180 - 15) Degree] (*Tropical*)
(*unsmoothed*)
```



Reconstitute signals in the summed minor planet data to all relative special points (major planets). So this is the sum of all effects except Mesarthim.

```
datatable = Import["datatable_v1.m"];

sumtable = Total[datatable⟦2 ;; All⟧];
```

```
samplingRate = 360;
t = sumtable;

(*Compute the DFT*)
dft = Fourier[t];

length = Length[t];
frequencies = Range[1, length] * (samplingRate / length);

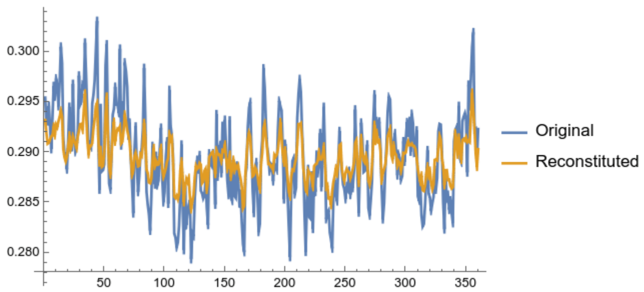
threshold = 1;
peakIndices = Flatten[Position[Abs[dft], _?(# > 0.003 &)]];
peakIndices = Cases[peakIndices, _?(# ≤ 180 &)];

peakFrequencies = frequencies⟦peakIndices⟧;
peakAmplitudes = Abs[dft⟦peakIndices⟧];
peakPeriods = N[360 / peakFrequencies];
peakPhases = Arg[dft⟦peakIndices⟧];

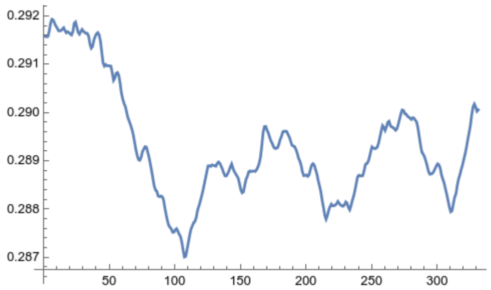
(*Zero out non-peak frequencies*)
modifiedDFT = ConstantArray[0 + 0 I, Length[dft]];
modifiedDFT⟦peakIndices⟧ = dft⟦peakIndices⟧;

(*Use InverseFourier to reconstruct the signal*)
reconstitutedWave = Re[InverseFourier[modifiedDFT]];

(*Plot the original and reconstituted waves*)
ListLinePlot[{t, reconstitutedWave}, PlotLegends → {"Original", "Reconstituted"}]
```




```
ListLinePlot[MovingAverage[reconstitutedWave, 30]]
```




```
peakIndices

{1, 2, 3, 4, 5, 6, 8, 9, 10, 11, 12, 13, 15, 16, 17, 19, 20, 21, 23, 24, 25, 26, 28, 29, 30, 31, 32, 33, 34, 35, 37, 38, 39, 40, 41,
 43, 44, 46, 47, 48, 50, 51, 52, 53, 54, 57, 58, 59, 64, 66, 67, 71, 76, 77, 78, 79, 81, 83, 88, 93, 95, 103, 107, 109, 110, 128, 133, 139, 158, 166}

Length[peakIndices]

70

(*ListPolarPlot[{reconstitutedWave}]*)

(*Compute the DFT*)dft = Fourier[t];

(*Determine frequency bins*)
length = Length[t];
frequencies = Range[1, Floor[length(*/2*)]] * (samplingRate / length);

(*Extract values at peakIndices*)
peakFrequencies = frequencies[[peakIndices]];
peakAmplitudes = Abs[dft[[peakIndices]]];
peakPeriods = N[360 / peakFrequencies];
peakPhases = Arg[dft[[peakIndices]]];

(*Display the results*)
TableForm[Transpose[{peakFrequencies, peakAmplitudes, peakPeriods, UnitConvert[Quantity[peakPhases, "Radians"], "Degree"]}],
 TableHeadings → {None, {"Frequency (1/Deg)", "Amplitude", "Period (Deg)", "Phase Shift"}}]
```

Frequency (1/Deg)	Amplitude	Period (Deg)	Phase Shift
1	5.49257	360.	0.°
2	0.023778	180.	15.1592°
3	0.0188621	120.	55.6922°
4	0.0138932	90.	128.023°
5	0.00823414	72.	25.4332°
6	0.0111071	60.	-21.1143°

8	0.00775999	45.	-62.1887°
9	0.00347149	40.	35.8635°
10	0.00694348	36.	-148.335°
11	0.00659734	32.7273	-26.8946°
12	0.00381675	30.	11.3446°
13	0.00378722	27.6923	50.3268°
15	0.00392605	24.	-132.632°
16	0.00647366	22.5	-168.232°
17	0.00950555	21.1765	-179.822°
19	0.0076028	18.9474	128.813°
20	0.00502491	18.	60.4437°
21	0.00665383	17.1429	-125.513°
23	0.00946361	15.6522	-47.0874°
24	0.0083137	15.	-155.337°
25	0.00704839	14.4	64.0482°
26	0.00997652	13.8462	-80.3153°
28	0.00917756	12.8571	-118.238°
29	0.00803816	12.4138	90.3199°
30	0.00501358	12.	-179.923°
31	0.00412462	11.6129	165.659°
32	0.00681014	11.25	-75.2251°
33	0.00710886	10.9091	90.179°
34	0.00353746	10.5882	141.536°
35	0.0109093	10.2857	-19.8334°
37	0.00506867	9.72973	73.5717°
38	0.0056058	9.47368	117.263°
39	0.00450366	9.23077	95.8848°
40	0.00375544	9.	149.801°
41	0.00689316	8.78049	176.253°
43	0.00475199	8.37209	-39.2248°
44	0.00373356	8.18182	-3.0526°
46	0.00433996	7.82609	95.872°
47	0.00679261	7.65957	142.822°
48	0.00651291	7.5	-138.79°
50	0.00331891	7.2	2.40736°
51	0.00520877	7.05882	123.383°
52	0.00319832	6.92308	-48.7828°
53	0.00661194	6.79245	53.3845°
54	0.00460563	6.66667	32.1527°
57	0.00590556	6.31579	26.3393°
58	0.00458832	6.2069	-52.5642°
59	0.00776223	6.10169	49.5183°
64	0.00323621	5.625	-52.1541°
66	0.00441472	5.45455	74.1843°

67	0.00349236	5.37313	47.2576°
71	0.00441089	5.07042	-50.8146°
76	0.00562121	4.73684	-95.2779°
77	0.00355806	4.67532	2.93208°
78	0.00312115	4.61538	11.1222°
79	0.00331144	4.55696	8.00787°
81	0.00424767	4.44444	125.869°
83	0.00410434	4.33735	-100.301°
88	0.00378433	4.09091	36.7019°
93	0.00413548	3.87097	-44.7452°
95	0.00345353	3.78947	160.996°
103	0.00318925	3.49515	95.5375°
107	0.0032724	3.36449	11.643°
109	0.00329376	3.30275	-43.1873°
110	0.00404636	3.27273	14.1111°
128	0.00311893	2.8125	6.49778°
133	0.00313905	2.70677	-51.9481°
139	0.00372976	2.58993	-164.283°
158	0.00328946	2.27848	1.1993°
166	0.00313837	2.16867	67.4957°

```
sumWave = Reverse[SortBy[Transpose[{peakPeriods, UnitConvert[Quantity[peakPhases, "Radians"], "Degree"], peakAmplitudes}], Last]]⟦1 ;; 6⟧
```

```
{{360., 0.°, 5.49257}, {180., 15.1592°, 0.023778}, {120., 55.6922°, 0.0188621}, {90., 128.023°, 0.0138932}, {60., -21.1143°, 0.0111071}, {10.2857, -19.8334°, 0.0109093}}
```

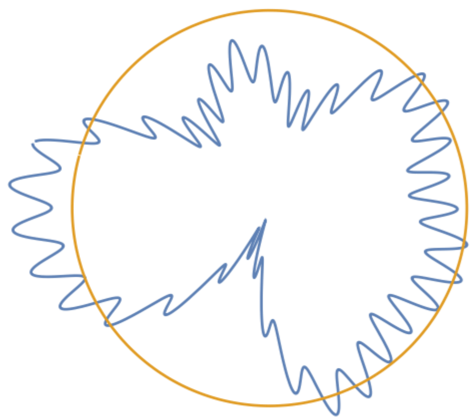
```
%⟦1 ;; 6, 1⟧
```

```
{360., 180., 120., 90., 60., 10.2857}
```

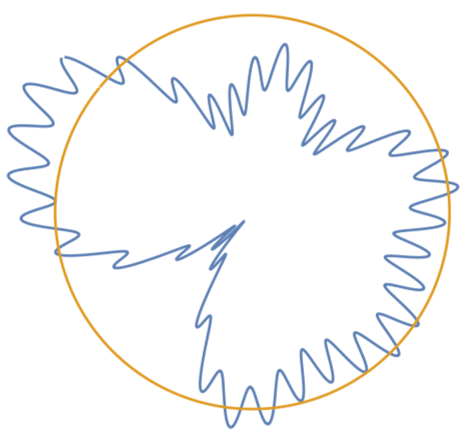
```
sumSumWave = Total[Table[sumWave⟦i⟧⟦3⟧ (0.5 + 0.5 Sin[(360 / sumWave⟦i⟧⟦1⟧) * x + (90 - QuantityMagnitude[sumWave⟦i⟧⟦2⟧]) Degree]), {i, 1, Length[sumWave]}]];
```

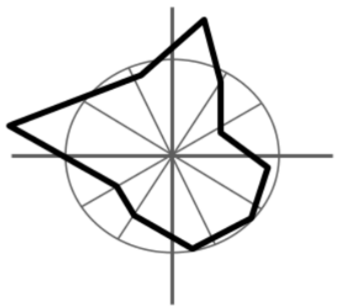
```
sumSumWave1 = Total[Table[sumWave⟦i⟧⟦3⟧ (0.5 + 0.5 Sin[(360 / sumWave⟦i⟧⟦1⟧) * x + (90 - QuantityMagnitude[sumWave⟦i⟧⟦2⟧]) Degree]), {i, 2, Length[sumWave]}]];
```

```
Rotate[Rotate[PolarPlot[{sumSumWave1, 0.05}, {x, 0 Degree, 359 Degree}, Axes → False], 0 Degree], (180 - 15) Degree] (*Tropical*)
```



```
Rotate[Rotate[PolarPlot[{sumSumWave1, 0.05}, {x, 0 Degree, 359 Degree}, Axes → False], -(ayanamActual) Degree], (180 - 15) Degree] (*Tropical*)
```





Reconstitute signals in the Mesarthim data.

```
(*Generate a sample signal*) samplingRate = 360;
(*t=sumtable;*)
t = datatable[[1]];
(*Compute the DFT*)
dft = Fourier[t];

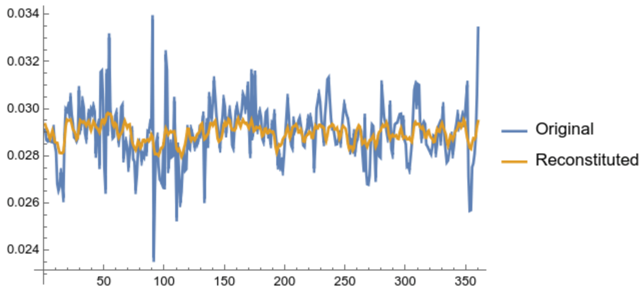
(*Identify peaks-for this example,we'll consider magnitudes greater than a threshold*)
(*threshold=0.008;
peakIndices=Flatten[Position[Abs[dft],_?(#>threshold&)]];*)
length = Length[t];
frequencies = Range[1, Floor[length / 2]] * (samplingRate / length);

threshold = 1;
peakIndices = Flatten[Position[Abs[dft], _ ? (# > 0.002 &)]];
peakIndices = Cases[peakIndices, _ ? (# ≤ 180 &)];
(*Print[peakIndices]
  peakIndices= Flatten[Cases[peakIndices,_?(Floor[#]≥1&)]];
Print[peakIndices]*)
(*Extract values at peakIndices*)
peakFrequencies = frequencies[[peakIndices]];
peakAmplitudes = Abs[dft[[peakIndices]]];
peakPeriods = N[360 / peakFrequencies];
peakPhases = Arg[dft[[peakIndices]]];

(*Zero out non-peak frequencies*)
modifiedDFT = ConstantArray[0 + 0 I, Length[dft]];
modifiedDFT[[peakIndices]] = dft[[peakIndices]];

(*Use InverseFourier to reconstruct the signal*)
reconstitutedWave = Re[InverseFourier[modifiedDFT]];

(*Plot the original and reconstituted waves*)
ListLinePlot[{t, reconstitutedWave}, PlotRange → All, PlotLegends → {"Original", "Reconstituted"}]
```




```
{Mean[t], Mean[reconstitutedWave]}
```

```
{0.0289761, 0.0289761}
```

```
(*ListPolarPlot[{reconstitutedWave}]*)

(*Compute the DFT*)dft = Fourier[t];

(*Determine frequency bins*)
length = Length[t];
frequencies = Range[1, Floor[length(*/2*)]] * (samplingRate / length);

(*Extract values at peakIndices*)
peakFrequencies = frequencies[[peakIndices]];
peakAmplitudes = Abs[dft[[peakIndices]]];
peakPeriods = N[360 / peakFrequencies];
peakPhases = Arg[dft[[peakIndices]]];

(*Display the results*)
TableForm[Transpose[{peakFrequencies, peakAmplitudes, peakPeriods, UnitConvert[Quantity[peakPhases, "Radians"], "Degree"]}],
 TableHeadings → {None, {"Frequency (1/Deg)", "Amplitude", "Period (Deg)", "Phase Shift"}}]
```

Frequency (1/Deg)	Amplitude	Period (Deg)	Phase Shift
1	0.549784	360.	0.°
3	0.00275873	120.	21.6558°
4	0.0032632	90.	127.702°
5	0.00386468	72.	-152.832°
7	0.00229217	51.4286	-78.1744°
11	0.00223377	32.7273	-101.373°
15	0.00219288	24.	12.7788°
19	0.00234113	18.9474	70.2309°
22	0.0035262	16.3636	25.9167°
23	0.00280194	15.6522	55.938°
31	0.00236449	11.6129	-133.982°
34	0.00202425	10.5882	-51.4212°
37	0.00262904	9.72973	-45.5943°

62	0.00236537	5.80645	-7.49959°
97	0.00205094	3.71134	-135.81°

```
MesarthimWave = Reverse[SortBy[Transpose[{peakPeriods, UnitConvert[Quantity[peakPhases, "Radians"], "Degree"], peakAmplitudes}], Last]][[1 ;; 6]]
```

```
{{360., 0.°, 0.549784}, {72., -152.832°, 0.00386468}, {16.3636, 25.9167°, 0.0035262}, {90., 127.702°, 0.0032632}, {15.6522, 55.938°, 0.00280194}, {120., 21.6558°, 0.00275873}}
```

```
%[[1 ;; 6, 1]]
```

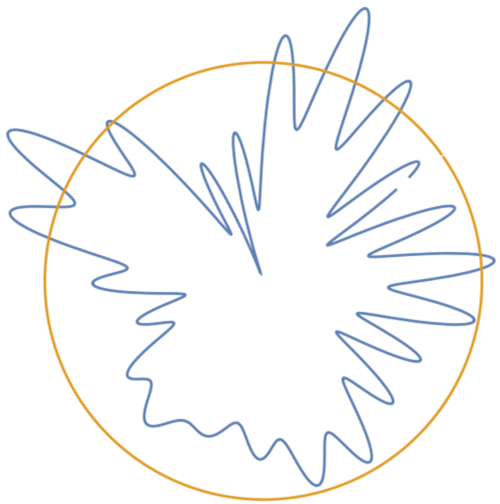
```
{360., 72., 16.3636, 90., 15.6522, 120.}
```

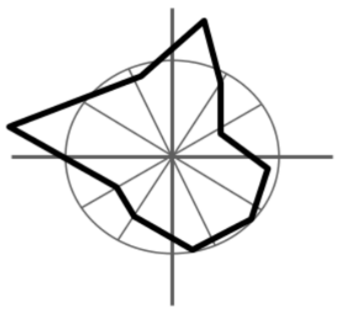
```
mesSumWave = Total[Table[MesarthimWave[[i]][[3]] (0.5 + 0.5 Sin[(360 / MesarthimWave[[i]][[1]]) * x + (90 - QuantityMagnitude[MesarthimWave[[i]][[2]]) Degree]), {i, 1, Length[MesarthimWave]}]];
```

```
mesSumWave1 = Total[Table[MesarthimWave[[i]][[3]] (0.5 + 0.5 Sin[(360 / MesarthimWave[[i]][[1]]) * x + (90 - QuantityMagnitude[MesarthimWave[[i]][[2]]) Degree]), {i, 2, Length[MesarthimWave]}]];
(*do not include the very dominant background base wave*)
```

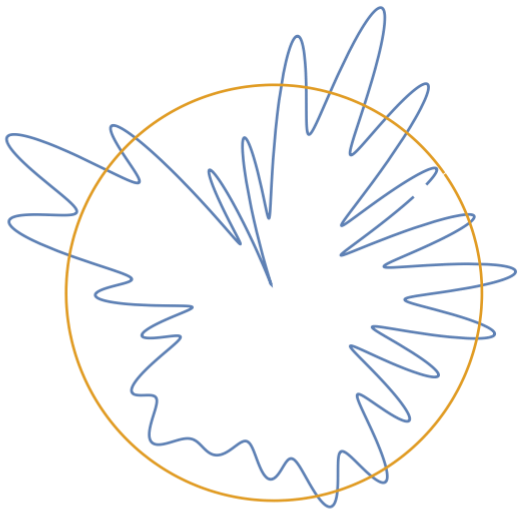
(Minor Planets - Mesarthim), so the focus here is on houses, ie the angular degrees of MAJOR planets to a phase shift to Mesarthim. The Gauquelin image is reproduced.

```
Rotate[Rotate[PolarPlot[{mesSumWave1, 0.011}, {x, 0 Degree, 359 Degree}, Axes → False], ((mesarthimGEL) * 1211) Degree], (180 - 15) Degree](*Tropical*) (*this one is good too!*)
```





```
Rotate[Rotate[PolarPlot[{mesSumWave1, 0.01}, {x, 0 Degree, 359 Degree}, Axes → False], ((mesarthimGEL - ayanamsha) * 1211) Degree], (180 - 15) Degree] (*Sidereal*)
```



Reconstitute signals in the Sun data.

```
(*Generate a sample signal*) samplingRate = 360;
(*t=sumtable;*)
t = datatable⟦2⟧;
(*Compute the DFT*)
dft = Fourier[t];

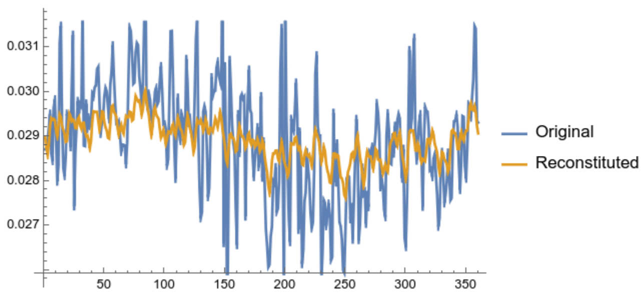
(*Identify peaks-for this example,we'll consider magnitudes greater than a threshold*)
(*threshold=0.008;
peakIndices=Flatten[Position[Abs[dft],_?(#>threshold&)]];*)
length = Length[t];
frequencies = Range[1, Floor[length / 2]] * (samplingRate / length);

threshold = 1;
peakIndices = Flatten[Position[Abs[dft], _? (# > 0.002 &)]];
peakIndices = Cases[peakIndices, _? (# ≤ 180 &)];
(*Print[peakIndices]
  peakIndices= Flatten[Cases[peakIndices,_?(Floor[#]≥1&)]];
Print[peakIndices]*)
(*Extract values at peakIndices*)
peakFrequencies = frequencies⟦peakIndices⟧;
peakAmplitudes = Abs[dft⟦peakIndices⟧];
peakPeriods = N[360 / peakFrequencies];
peakPhases = Arg[dft⟦peakIndices⟧];

(*Zero out non-peak frequencies*)
modifiedDFT = ConstantArray[0 + 0 I, Length[dft]];
modifiedDFT⟦peakIndices⟧ = dft⟦peakIndices⟧;

(*Use InverseFourier to reconstruct the signal*)
reconstitutedWave = Re[InverseFourier[modifiedDFT]];

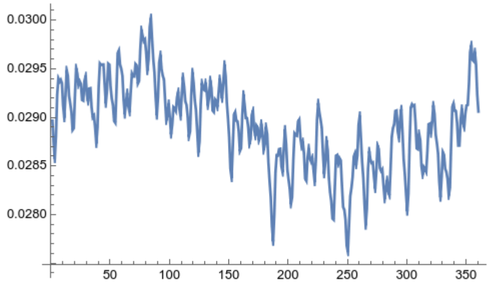
(*Plot the original and reconstituted waves*)
ListLinePlot[{t, reconstitutedWave}, PlotLegends → {"Original", "Reconstituted"}]
```




```
{Mean[t], Mean[reconstitutedWave]}

{0.0289143, 0.0289143}
```

```
ListLinePlot[{reconstitutedWave}]
```




```
(*ListPolarPlot[{reconstitutedWave}]*)

(*Compute the DFT*) t = datatable⟦2⟧; dft = Fourier[t];

(*Determine frequency bins*)
length = Length[t];
frequencies = Range[1, Floor[length (*/2*)]] * (samplingRate / length);

(*Extract values at peakIndices*)
peakFrequencies = frequencies⟦peakIndices⟧;
peakAmplitudes = Abs[dft⟦peakIndices⟧];
peakPeriods = N[360 / peakFrequencies];
peakPhases = Arg[dft⟦peakIndices⟧];

(*Display the results*)
TableForm[Transpose[{peakFrequencies, peakAmplitudes, peakPeriods, UnitConvert[Quantity[peakPhases, "Radians"], "Degree"]}],
 TableHeadings → {None, {"Frequency (1/Deg)", "Amplitude", "Period (Deg)", "Phase Shift"}}]
```

Frequency (1/Deg)	Amplitude	Period (Deg)	Phase Shift
1	0.54861	360.	0.°
2	0.00908042	180.	66.9345°
6	0.00287751	60.	15.4501°
9	0.0021185	40.	-63.8873°
13	0.002452	27.6923	-121.488°
23	0.00341866	15.6522	-108.77°
24	0.00235939	15.	169.95°
30	0.00219447	12.	-165.422°
42	0.00281253	8.57143	-166.785°
52	0.00265652	6.92308	-56.9803°
93	0.00210458	3.87097	24.385°

```
SunWave = Reverse[SortBy[Transpose[{peakPeriods, UnitConvert[Quantity[peakPhases, "Radians"], "Degree"], peakAmplitudes}], Last]]
```

```
{{360., 0.°, 0.54861}, {180., 66.9345°, 0.00908042}, {15.6522, -108.77°, 0.00341866},
 {60., 15.4501°, 0.00287751}, {8.57143, -166.785°, 0.00281253}, {6.92308, -56.9803°, 0.00265652}, {27.6923, -121.488°, 0.002452},
 {15., 169.95°, 0.00235939}, {12., -165.422°, 0.00219447}, {40., -63.8873°, 0.0021185}, {3.87097, 24.385°, 0.00210458}}
```

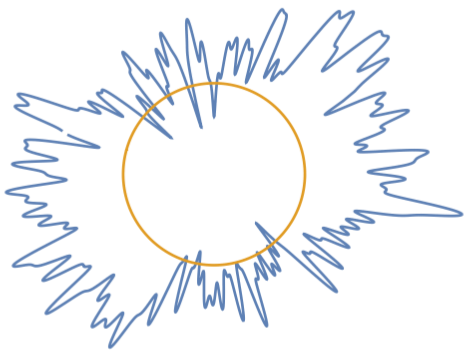
```
%[[1 ;; 6, 1]]
```

```
{360., 180., 15.6522, 60., 8.57143, 6.92308}
```

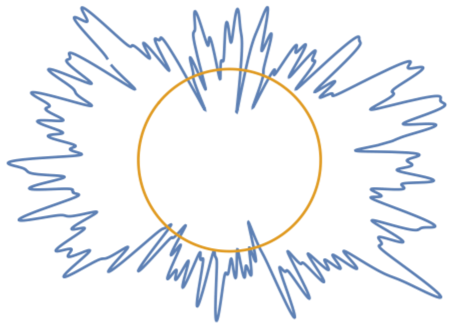
```
sunSumWave = Total[Table[SunWave[[i]][[3]] (0.5 + 0.5 Sin[(360 / SunWave[[i]][[1]]) * x + (90 - QuantityMagnitude[SunWave[[i]][[2]]]) Degree]), {i, 1, Length[SunWave]}]];

sunSumWave1 = Total[Table[SunWave[[i]][[3]] (0.5 + 0.5 Sin[(360 / SunWave[[i]][[1]]) * x + (90 - QuantityMagnitude[SunWave[[i]][[2]]]) Degree]), {i, 2, Length[SunWave]}]];

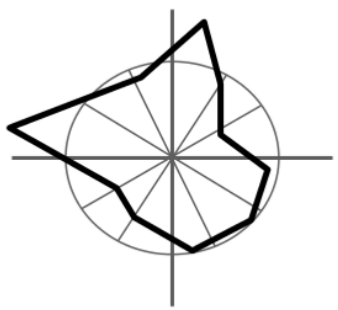
Rotate[Rotate[PolarPlot[{sunSumWave1, 0.01}, {x, 0 Degree, 359 Degree}, Axes → False, PlotRange → All, Axes → False], (0) Degree], (180 - 15) Degree] (*Tropical*)
```



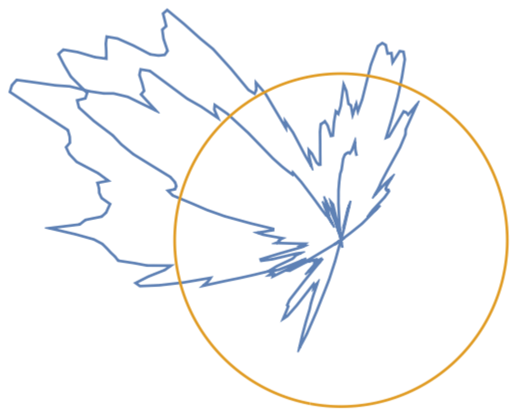
```
Rotate[Rotate[PolarPlot[{sunSumWave1, 0.01}, {x, 0 Degree, 359 Degree}, Axes → False, PlotRange → All, Axes → False], (-ayanamsha) Degree], (180 - 15) Degree] (*Sidereal*)
```



```
Rotate[Rotate[ListPolarPlot[{-MovingAverage[datatable[[2]] - datatable[[1]], 30], ConstantArray[0.001, 360]}, PlotRange → All, Joined → {True, True}, Axes → False],
  -((mesarthimGEL * 1211)) Degree], (180 - 15) Degree] (*Tropical*)
(*Sun Effect*)
```



```
Rotate[Rotate[ListPolarPlot[{-MovingAverage[datatable[[2]] - datatable[[1]], 30], ConstantArray[0.001, 360]}, PlotRange → All, Joined → {True, True}, Axes → False],
  - (((mesarthimGEL - ayanamActual) * 1211)) Degree], (180 - 15) Degree] (*Sidereal*)
(*Sun Effect*)
```



Reconstitute signals in the Moon data.

```
(*Generate a sample signal*) samplingRate = 360;
(*t=sumtable;*)
t = datatable[[3]];
(*Compute the DFT*)
dft = Fourier[t];

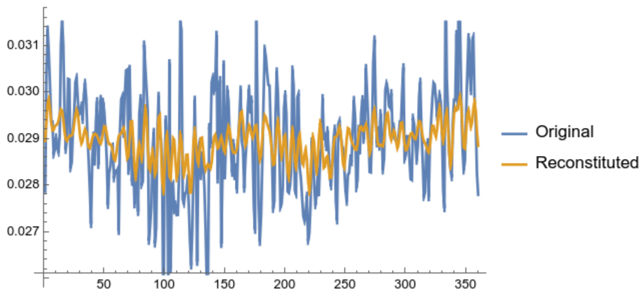
(*Identify peaks-for this example,we'll consider magnitudes greater than a threshold*)
(*threshold=0.008;
peakIndices=Flatten[Position[Abs[dft],_?(#>threshold&)]];*)
length = Length[t];
frequencies = Range[1, Floor[length / 2]] * (samplingRate / length);

threshold = 1;
peakIndices = Flatten[Position[Abs[dft], _? (# > 0.002 &)]];
peakIndices = Cases[peakIndices, _? (# ≤ 180 &)];
(*Print[peakIndices]
  peakIndices= Flatten[Cases[peakIndices,_?(Floor[#]≥1&)]];
Print[peakIndices]*)
(*Extract values at peakIndices*)
peakFrequencies = frequencies[[peakIndices]];
peakAmplitudes = Abs[dft[[peakIndices]]];
peakPeriods = N[360 / peakFrequencies];
peakPhases = Arg[dft[[peakIndices]]];

(*Zero out non-peak frequencies*)
modifiedDFT = ConstantArray[0 + 0 I, Length[dft]];
modifiedDFT[[peakIndices]] = dft[[peakIndices]];

(*Use InverseFourier to reconstruct the signal*)
reconstitutedWave = Re[InverseFourier[modifiedDFT]];

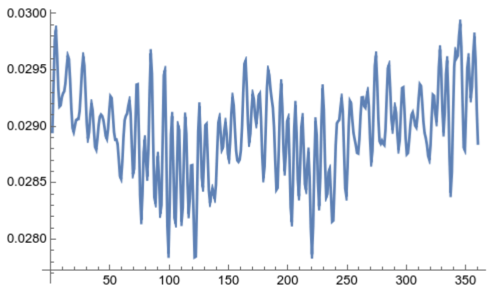
(*Plot the original and reconstituted waves*)
ListLinePlot[{t, reconstitutedWave}, PlotLegends → {"Original", "Reconstituted"}]
```




```
{Mean[t], Mean[reconstitutedWave]}

{0.0289577, 0.0289577}
```

```
ListLinePlot[{reconstitutedWave}]
```




```
(*ListPolarPlot[{reconstitutedWave}]*)

(*Compute the DFT*)dft = Fourier[t];

(*Determine frequency bins*)
length = Length[t];
frequencies = Range[1, Floor[length(*/2*)]] * (samplingRate / length);

(*Extract values at peakIndices*)
peakFrequencies = frequencies[[peakIndices]];
peakAmplitudes = Abs[dft[[peakIndices]]];
peakPeriods = N[360 / peakFrequencies];
peakPhases = Arg[dft[[peakIndices]]];

(*Display the results*)
TableForm[Transpose[{peakFrequencies, peakAmplitudes, peakPeriods, UnitConvert[Quantity[peakPhases, "Radians"], "Degree"]}],
 TableHeadings → {None, {"Frequency (1/Deg)", "Amplitude", "Period (Deg)", "Phase Shift"}}]
```

Frequency (1/Deg)	Amplitude	Period (Deg)	Phase Shift
1	0.549434	360.	0.°
2	0.00456049	180.	-24.2111°
3	0.00310744	120.	-13.3567°
4	0.00217935	90.	120.685°
5	0.00273099	72.	-28.404°
19	0.00215916	18.9474	113.129°
23	0.00205203	15.6522	-39.9255°
26	0.00221875	13.8462	-100.756°
33	0.00293056	10.9091	133.076°
37	0.00297973	9.72973	104.775°
49	0.00235909	7.34694	177.445°
60	0.00263601	6.	-177.987°
63	0.00333782	5.71429	103.497°
64	0.00226241	5.625	-132.83°

0.00214348 5.45455 55.5178°

```
MoonWave = Reverse[SortBy[Transpose[{peakPeriods, UnitConvert[Quantity[peakPhases, "Radians"], "Degree"], peakAmplitudes}], Last]]

{{360., 0.°, 0.549434}, {180., -24.2111°, 0.00456049}, {5.71429, 103.497°, 0.00333782}, {120., -13.3567°, 0.00310744}, {9.72973, 104.775°, 0.00297973},
 {10.9091, 133.076°, 0.00293056}, {72., -28.404°, 0.00273099}, {6., -177.987°, 0.00263601}, {7.34694, 177.445°, 0.00235909}, {5.625, -132.83°, 0.00226241},
 {13.8462, -100.756°, 0.00221875}, {90., 120.685°, 0.00217935}, {18.9474, 113.129°, 0.00215916}, {5.45455, 55.5178°, 0.00214348}, {15.6522, -39.9255°, 0.00205203}}

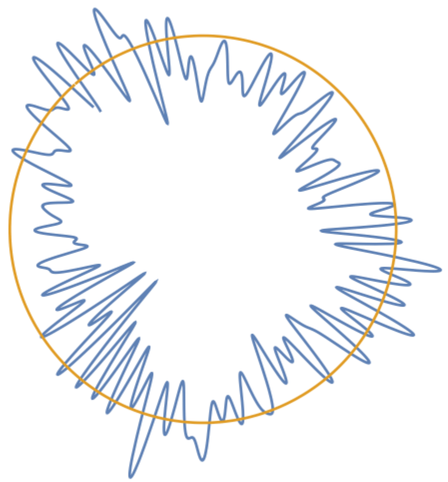
%[[1 ;; 6, 1]]

{360., 180., 5.71429, 120., 9.72973, 10.9091}

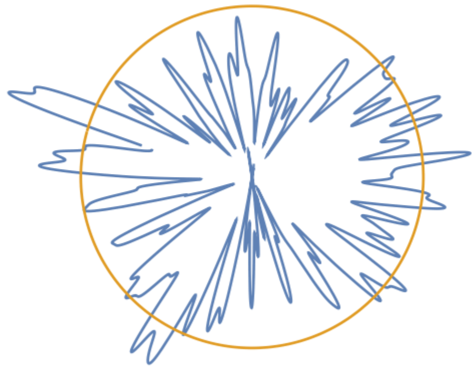
moonSumWave = Total[Table[MoonWave[[i]][[3]] (0.5 + 0.5 Sin[(360 / MoonWave[[i]][[1]]) * x + (90 - QuantityMagnitude[MoonWave[[i]][[2]]]) Degree]), {i, 1, Length[MoonWave]}]];

moonSumWave1 = Total[Table[MoonWave[[i]][[3]] (0.5 + 0.5 Sin[(360 / MoonWave[[i]][[1]]) * x + (90 - QuantityMagnitude[MoonWave[[i]][[2]]]) Degree]), {i, 2, Length[MoonWave]}]];

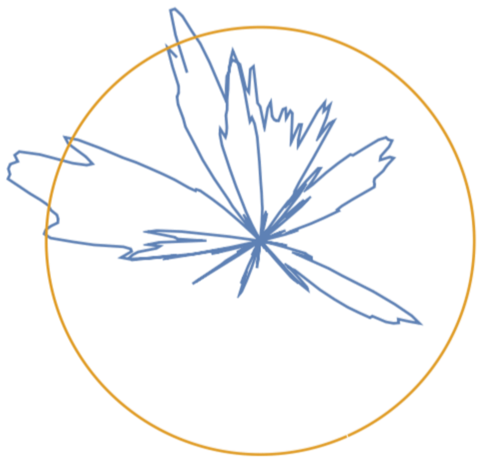
Rotate[PolarPlot[{moonSumWave1, 0.022}, {x, 0 Degree, 359 Degree}, Axes → False], (180 - 15 - 33) Degree] (*Tropical*)
```

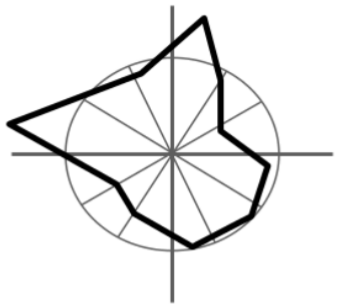


```
Rotate[PolarPlot[{sunSumWave + moonSumWave - 2 mesSumWave, 0.026}, {x, 0 Degree, 359 Degree}, Axes → False], (180 - 15) Degree] (*Tropical*)
```

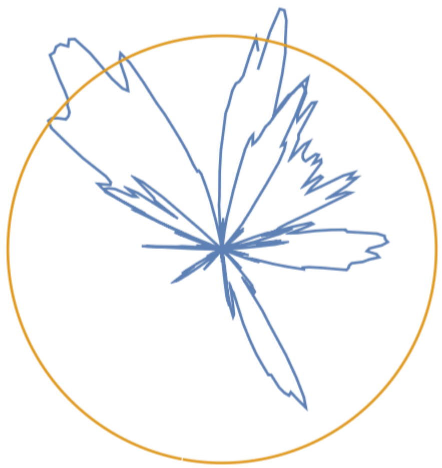


```
Rotate[Rotate[ListPolarPlot[{-MovingAverage[datatable[[3]] - datatable[[1]], 30], ConstantArray[0.001, 360]}, PlotRange → All, Joined → {True, True}, Axes → False],
  -((mesarthimGEL * 1211)) Degree], (180 - 15) Degree] (*Tropical*)
(*Moon Effect*)
```





```
Rotate[Rotate[ListPolarPlot[{-MovingAverage[datatable[[3]] - datatable[[1]], 30], ConstantArray[0.001, 360]}, PlotRange → All, Joined → {True, True}, Axes → False],
  -(((mesarthimGEL - ayanamActual) * 1211)) Degree], (180 - 15) Degree] (*Sidereal*)
(*Moon Effect*)
```



Reconstitute signals in the Mercury data.

```
(*Generate a sample signal*) samplingRate = 360;
(*t=sumtable;*)
t = datatable[[4]];
(*Compute the DFT*)
dft = Fourier[t];

(*Identify peaks-for this example,we'll consider magnitudes greater than a threshold*)
(*threshold=0.008;
peakIndices=Flatten[Position[Abs[dft],_?(#>threshold&)]];*)
length = Length[t];
frequencies = Range[1, Floor[length / 2]] * (samplingRate / length);

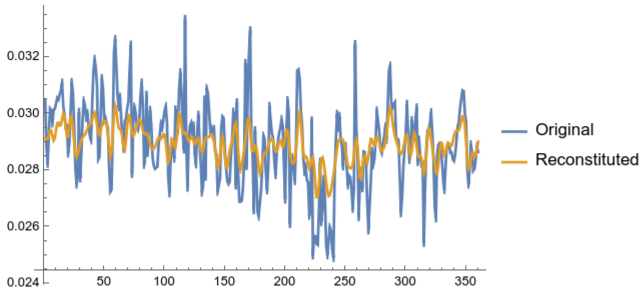
threshold = 1;
peakIndices = Flatten[Position[Abs[dft], _ ? (# > 0.002 &)]];
peakIndices = Cases[peakIndices, _ ? (# ≤ 180 &)];

(*Print[peakIndices]
  peakIndices= Flatten[Cases[peakIndices,_?(Floor[#]≥1&)]];
Print[peakIndices]*)
(*Extract values at peakIndices*)
peakFrequencies = frequencies[[peakIndices]];
peakAmplitudes = Abs[dft[[peakIndices]]];
peakPeriods = N[360 / peakFrequencies];
peakPhases = Arg[dft[[peakIndices]]];

(*Zero out non-peak frequencies*)
modifiedDFT = ConstantArray[0 + 0 I, Length[dft]];
modifiedDFT[[peakIndices]] = dft[[peakIndices]];

(*Use InverseFourier to reconstruct the signal*)
reconstitutedWave = Re[InverseFourier[modifiedDFT]];

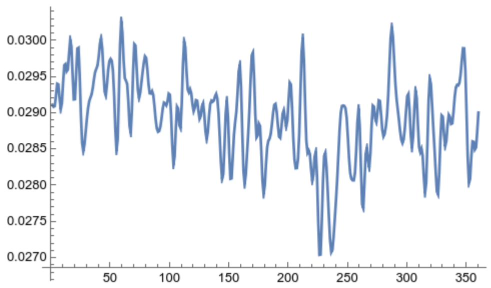
(*Plot the original and reconstituted waves*)
ListLinePlot[{t, reconstitutedWave}, PlotLegends → {"Original", "Reconstituted"}]
```




```
{Mean[t], Mean[reconstitutedWave]}

{0.0289301, 0.0289301}
```

```
ListLinePlot[{reconstitutedWave}]
```




```
(*ListPolarPlot[{reconstitutedWave}]*)

(*Compute the DFT*)dft = Fourier[t];

(*Determine frequency bins*)
length = Length[t];
frequencies = Range[1, Floor[length(*/2*)]] * (samplingRate / length);

(*Extract values at peakIndices*)
peakFrequencies = frequencies⟦peakIndices⟧;
peakAmplitudes = Abs[dft⟦peakIndices⟧];
peakPeriods = N[360 / peakFrequencies];
peakPhases = Arg[dft⟦peakIndices⟧];

(*Display the results*)
TableForm[Transpose[{peakFrequencies, peakAmplitudes, peakPeriods, UnitConvert[Quantity[peakPhases, "Radians"], "Degree"]}],
 TableHeadings → {None, {"Frequency (1/Deg)", "Amplitude", "Period (Deg)", "Phase Shift"}}]
```

Frequency (1/Deg)	Amplitude	Period (Deg)	Phase Shift
1	0.54891	360.	0.°
2	0.00812637	180.	52.1427°
4	0.00347099	90.	150.898°
5	0.0033287	72.	56.7481°
6	0.00302533	60.	-62.7585°
9	0.00340902	40.	-168.965°
10	0.00285225	36.	61.9418°
12	0.00303363	30.	156.131°
13	0.00295927	27.6923	137.86°
15	0.0026433	24.	151.004°
20	0.00391335	18.	23.5806°
25	0.00383844	14.4	83.5874°
26	0.00329975	13.8462	-35.7933°
30	0.0031729	12.	-72.8631°
34	0.00287449	10.5882	121.241°

35	0.00216494	10.2857	-36.5896°
37	0.00252934	9.72973	-46.2056°
39	0.00232985	9.23077	131.442°
41	0.00343598	8.78049	179.815°
53	0.00293621	6.79245	67.9364°
62	0.00259453	5.80645	-86.4542°
69	0.00202794	5.21739	-30.3157°

```
MercuryWave = Reverse[SortBy[Transpose[{peakPeriods, UnitConvert[Quantity[peakPhases, "Radians"], "Degree"], peakAmplitudes}], Last]]

{{360., 0.°, 0.54891}, {180., 52.1427°, 0.00812637}, {18., 23.5806°, 0.00391335}, {14.4, 83.5874°, 0.00383844}, {90., 150.898°, 0.00347099},
 {8.78049, 179.815°, 0.00343598}, {40., -168.965°, 0.00340902}, {72., 56.7481°, 0.0033287}, {13.8462, -35.7933°, 0.00329975},
 {12., -72.8631°, 0.0031729}, {30., 156.131°, 0.00303363}, {60., -62.7585°, 0.00302533}, {27.6923, 137.86°, 0.00295927}, {6.79245, 67.9364°, 0.00293621},
 {10.5882, 121.241°, 0.00287449}, {36., 61.9418°, 0.00285225}, {24., 151.004°, 0.0026433}, {5.80645, -86.4542°, 0.00259453},
 {9.72973, -46.2056°, 0.00252934}, {9.23077, 131.442°, 0.00232985}, {10.2857, -36.5896°, 0.00216494}, {5.21739, -30.3157°, 0.00202794}}

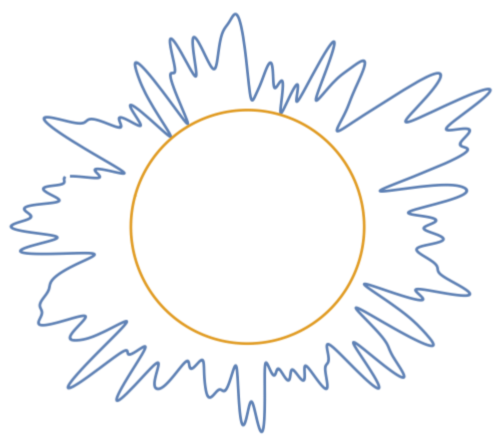
%[[1 ;; 6, 1]]

{360., 180., 18., 14.4, 90., 8.78049}

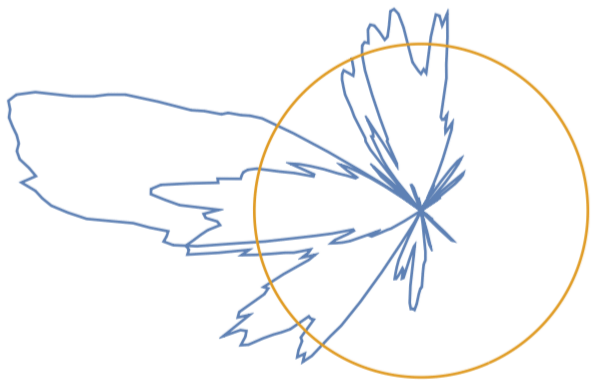
mercurySumWave = Total[Table[MercuryWave[[i]][[3]] (0.5 + 0.5 Sin[(360 / MercuryWave[[i]][[1]]) * x + (90 - QuantityMagnitude[MercuryWave[[i]][[2]]]) Degree]), {i, 1, Length[MercuryWave]}]];

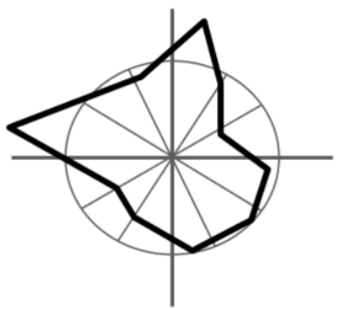
mercurySumWave1 = Total[Table[MercuryWave[[i]][[3]] (0.5 + 0.5 Sin[(360 / MercuryWave[[i]][[1]]) * x + (90 - QuantityMagnitude[MercuryWave[[i]][[2]]]) Degree]), {i, 2, Length[MercuryWave]}]];

Rotate[PolarPlot[{mercurySumWave1, 0.022}, {x, 0 Degree, 359 Degree}, Axes → False], (180 - 15) Degree] (*Tropical*)
```



```
Rotate[Rotate[ListPolarPlot[{-MovingAverage[datatable[[4]] - datatable[[1]], 30], ConstantArray[0.001, 360]}, PlotRange → All, Joined → {True, True}, Axes → False],
  -((mesarthimGEL * 1211)) Degree], (180 - 15) Degree] (*Tropical*)
(*Mercury Effect*)
```





```
Rotate[Rotate[ListPolarPlot[{-MovingAverage[datatable⟦4⟧ - datatable⟦1⟧, 30], ConstantArray[0.001, 360]}, PlotRange → All, Joined → {True, True}, Axes → False],
  -(((mesarthimGEL - ayanamActual) * 1211)) Degree], (180 - 15) Degree] (*Sidereal*)
(*Mercury Effect*)
```

Reconstitute signals in the Venus data.

```
(*Generate a sample signal*) samplingRate = 360;
(*t=sumtable;*)
t = datatable[[5]];
(*Compute the DFT*)
dft = Fourier[t];

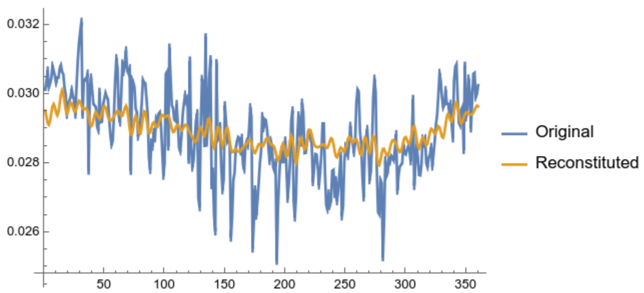
(*Identify peaks-for this example,we'll consider magnitudes greater than a threshold*)
(*threshold=0.008;
peakIndices=Flatten[Position[Abs[dft],_?(#>threshold&)]];*)
length = Length[t];
frequencies = Range[1, Floor[length / 2]] * (samplingRate / length);

threshold = 1;
peakIndices = Flatten[Position[Abs[dft], _ ? (# > 0.002 &)]];
peakIndices = Cases[peakIndices, _ ? (# ≤ 180 &)];
(*Print[peakIndices]
  peakIndices= Flatten[Cases[peakIndices,_?(Floor[#]≥1&)]];
Print[peakIndices]*)
(*Extract values at peakIndices*)
peakFrequencies = frequencies[[peakIndices]];
peakAmplitudes = Abs[dft[[peakIndices]]];
peakPeriods = N[360 / peakFrequencies];
peakPhases = Arg[dft[[peakIndices]]];

(*Zero out non-peak frequencies*)
modifiedDFT = ConstantArray[0 + 0 I, Length[dft]];
modifiedDFT[[peakIndices]] = dft[[peakIndices]];

(*Use InverseFourier to reconstruct the signal*)
reconstitutedWave = Re[InverseFourier[modifiedDFT]];

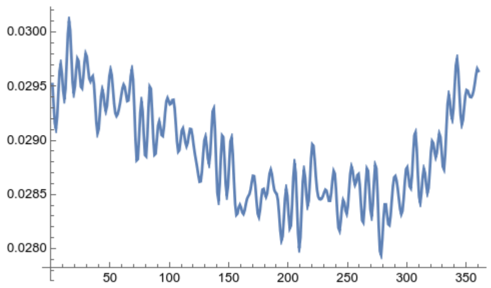
(*Plot the original and reconstituted waves*)
ListLinePlot[{t, reconstitutedWave}, PlotLegends → {"Original", "Reconstituted"}]
```




```
{Mean[t], Mean[reconstitutedWave]}

{0.0288989, 0.0288989}
```

```
ListLinePlot[{reconstitutedWave}]
```




```
(*ListPolarPlot[{reconstitutedWave}]*)

(*Compute the DFT*)dft = Fourier[t];

(*Determine frequency bins*)
length = Length[t];
frequencies = Range[1, Floor[length(*/2*)]] * (samplingRate / length);

(*Extract values at peakIndices*)
peakFrequencies = frequencies[[peakIndices]];
peakAmplitudes = Abs[dft[[peakIndices]]];
peakPeriods = N[360 / peakFrequencies];
peakPhases = Arg[dft[[peakIndices]]];

(*Display the results*)
TableForm[Transpose[{peakFrequencies, peakAmplitudes, peakPeriods, UnitConvert[Quantity[peakPhases, "Radians"], "Degree"]}],
 TableHeadings → {None, {"Frequency (1/Deg)", "Amplitude", "Period (Deg)", "Phase Shift"}}]
```

Frequency (1/Deg)	Amplitude	Period (Deg)	Phase Shift
1	0.548319	360.	0.°
2	0.0104926	180.	39.1871°
3	0.00250148	120.	42.358°
4	0.00240091	90.	-7.10397°
10	0.0023181	36.	-179.6°
22	0.00280949	16.3636	-86.3743°
43	0.00228635	8.37209	-86.9755°
48	0.00208472	7.5	-101.87°
54	0.00225487	6.66667	30.4424°

```
VenusWave = Reverse[SortBy[Transpose[{peakPeriods, UnitConvert[Quantity[peakPhases, "Radians"], "Degree"], peakAmplitudes}], Last]]
```

```
{{360., 0.°, 0.548319}, {180., 39.1871°, 0.0104926}, {16.3636, -86.3743°, 0.00280949}, {120., 42.358°, 0.00250148},
 {90., -7.10397°, 0.00240091}, {36., -179.6°, 0.0023181}, {8.37209, -86.9755°, 0.00228635}, {6.66667, 30.4424°, 0.00225487}, {7.5, -101.87°, 0.00208472}}
```

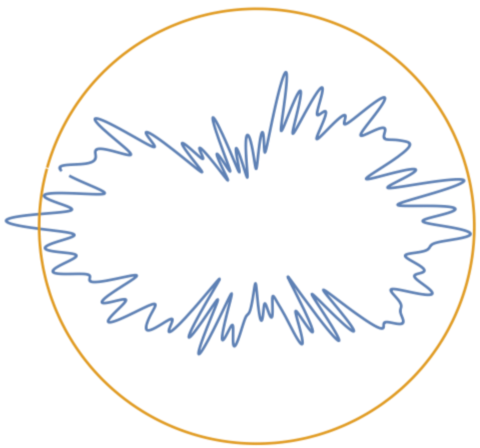
```
%[[1 ;; 6, 1]]
```

```
{360., 180., 16.3636, 120., 90., 36.}
```

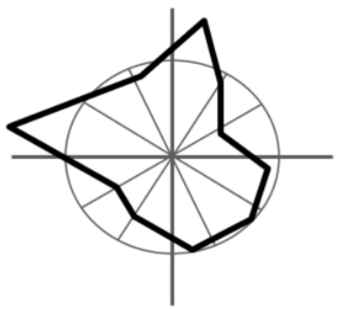
```
venusSumWave = Total[Table[VenusWave[[i]][[3]] (0.5 + 0.5 Sin[(360 / VenusWave[[i]][[1]]) * x + (90 - QuantityMagnitude[VenusWave[[i]][[2]]) Degree]), {i, 1, Length[VenusWave]}]];
```

```
venusSumWave1 = Total[Table[VenusWave[[i]][[3]] (0.5 + 0.5 Sin[(360 / VenusWave[[i]][[1]]) * x + (90 - QuantityMagnitude[VenusWave[[i]][[2]]) Degree]), {i, 2, Length[VenusWave]}]];
```

```
Rotate[PolarPlot[{venusSumWave1, 0.022}, {x, 0 Degree, 359 Degree}, Axes → False], (180 - 15) Degree] (*Tropical*)
```



```
Rotate[Rotate[ListPolarPlot[{-MovingAverage[datatable[[5]] - datatable[[1]], 30], ConstantArray[0.001, 360]}, PlotRange → All, Joined → {True, True}, Axes → False],
  - ((mesarthimGEL * 1211)) Degree], (180 - 15) Degree] (*Tropical*)
(*Venus Effect*)
```



```
Rotate[Rotate[ListPolarPlot[{-MovingAverage[datatable[[5]] - datatable[[1]], 30], ConstantArray[0.001, 360]}, PlotRange → All, Joined → {True, True}, Axes → False],
  - (((mesarthimGEL - ayanamActual) * 1211)) Degree], (180 - 15) Degree] (*Sidereal*)
(*Venus Effect*)
```

Reconstitute signals in the Mars data.

```
(*Generate a sample signal*) samplingRate = 360;

(*t=sumtable;*)
t = datatable〚6〛;
(*Compute the DFT*)
dft = Fourier[t];

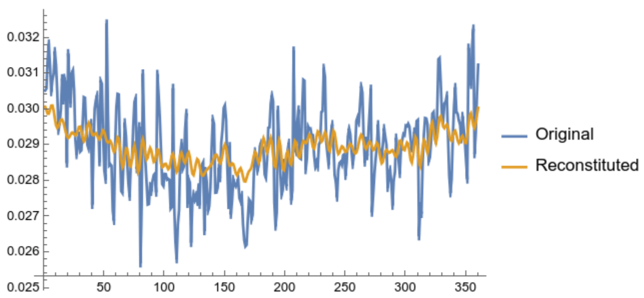
(*Identify peaks-for this example,we'll consider magnitudes greater than a threshold*)
(*threshold=0.008;
peakIndices=Flatten[Position[Abs[dft],_?(#>threshold&)]];*)
length = Length[t];
frequencies = Range[1, Floor[length / 2]] * (samplingRate / length);

threshold = 1;
peakIndices = Flatten[Position[Abs[dft], _? (# > 0.002 &)]];
peakIndices = Cases[peakIndices, _? (# ≤ 180 &)];
(*Print[peakIndices]
  peakIndices= Flatten[Cases[peakIndices,_?(Floor[#]≥1&)]];
Print[peakIndices]*)
(*Extract values at peakIndices*)
peakFrequencies = frequencies〚peakIndices〛;
peakAmplitudes = Abs[dft〚peakIndices〛];
peakPeriods = N[360 / peakFrequencies];
peakPhases = Arg[dft〚peakIndices〛];

(*Zero out non-peak frequencies*)
modifiedDFT = ConstantArray[0 + 0 I, Length[dft]];
modifiedDFT〚peakIndices〛 = dft〚peakIndices〛;

(*Use InverseFourier to reconstruct the signal*)
reconstitutedWave = Re[InverseFourier[modifiedDFT]];

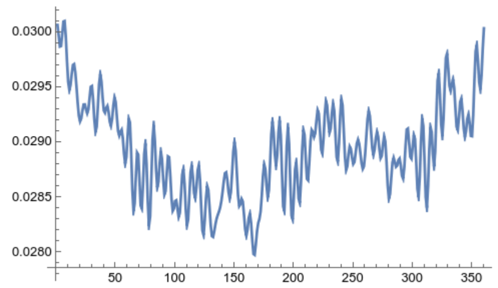
(*Plot the original and reconstituted waves*)
ListLinePlot[{t, reconstitutedWave}, PlotLegends → {"Original", "Reconstituted"}]
```




```
{Mean[t], Mean[reconstitutedWave]}

{0.0289337, 0.0289337}
```

```
ListLinePlot[{reconstitutedWave}]
```




```
(*ListPolarPlot[{reconstitutedWave}]*)

(*Compute the DFT*)dft = Fourier[t];

(*Determine frequency bins*)
length = Length[t];
frequencies = Range[1, Floor[length(*/2*)]] * (samplingRate / length);

(*Extract values at peakIndices*)
peakFrequencies = frequencies[[peakIndices]];
peakAmplitudes = Abs[dft[[peakIndices]]];
peakPeriods = N[360 / peakFrequencies];
peakPhases = Arg[dft[[peakIndices]]];

(*Display the results*)
TableForm[Transpose[{peakFrequencies, peakAmplitudes, peakPeriods, UnitConvert[Quantity[peakPhases, "Radians"], "Degree"]}],
 TableHeadings → {None, {"Frequency (1/Deg)", "Amplitude", "Period (Deg)", "Phase Shift"}}]
```

Frequency (1/Deg)	Amplitude	Period (Deg)	Phase Shift
1	0.548978	360.	0.°
2	0.00774051	180.	-21.982°
3	0.00492156	120.	44.341°
4	0.00254926	90.	-8.18981°
9	0.00242539	40.	33.0015°
11	0.00284167	32.7273	51.1565°
13	0.00222276	27.6923	-19.5844°
33	0.00221425	10.9091	116.537°
49	0.00201117	7.34694	-39.7532°
55	0.00238838	6.54545	26.6427°
58	0.00246615	6.2069	-96.7531°

```
MarsWave = Reverse[SortBy[Transpose[{peakPeriods, UnitConvert[Quantity[peakPhases, "Radians"], "Degree"], peakAmplitudes}], Last]]
```

```
{{360., 0.°, 0.548978}, {180., -21.982°, 0.00774051}, {120., 44.341°, 0.00492156}, {32.7273, 51.1565°, 0.00284167}, {90., -8.18981°, 0.00254926}, {6.2069, -96.7531°, 0.00246615},
 {40., 33.0015°, 0.00242539}, {6.54545, 26.6427°, 0.00238838}, {27.6923, -19.5844°, 0.00222276}, {10.9091, 116.537°, 0.00221425}, {7.34694, -39.7532°, 0.00201117}}
```

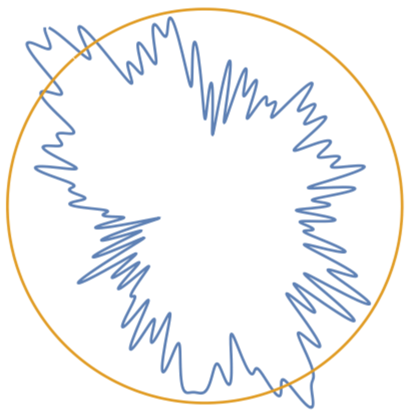
```
%[[1 ;; 6, 1]]
```

```
{360., 180., 120., 32.7273, 90., 6.2069}
```

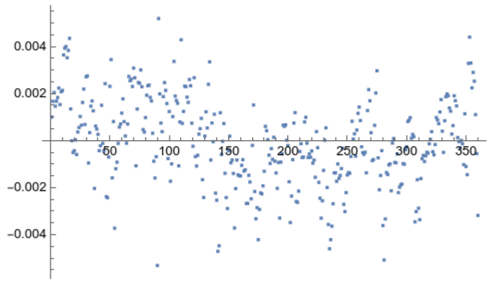
```
MarsSumWave = Total[Table[MarsWave[[i]][[3]] (0.5 + 0.5 Sin[(360 / MarsWave[[i]][[1]]) * x + (90 - QuantityMagnitude[MarsWave[[i]][[2]]]) Degree]), {i, 1, Length[MarsWave]}]];
```

```
MarsSumWave1 = Total[Table[MarsWave[[i]][[3]] (0.5 + 0.5 Sin[(360 / MarsWave[[i]][[1]]) * x + (90 - QuantityMagnitude[MarsWave[[i]][[2]]]) Degree]), {i, 2, Length[MarsWave]}]];
```

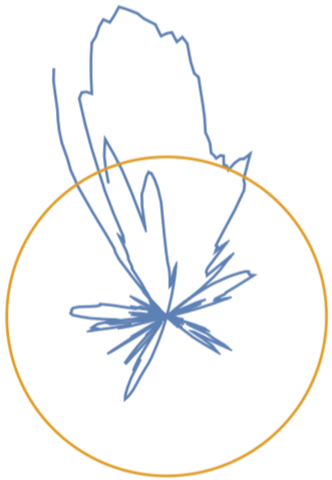
```
Rotate[PolarPlot[{MarsSumWave1, 0.022}, {x, 0 Degree, 359 Degree}, Axes → False], (180 - 15 - 33) Degree] (*Tropical*)
```

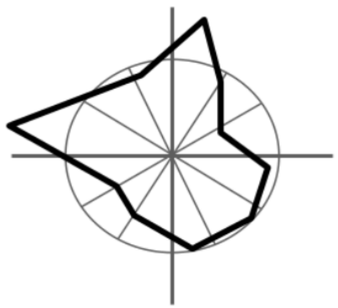


```
ListPlot[datatable[[5]] - datatable[[1]], PlotRange → All]
```

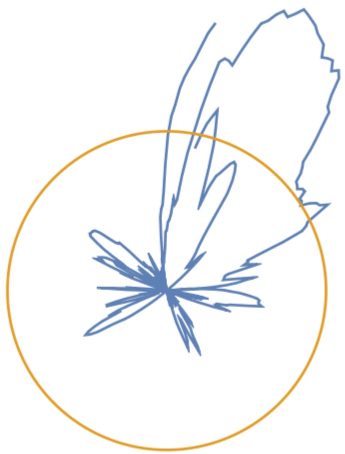



```
Rotate[Rotate[ListPolarPlot[{-MovingAverage[datatable[[6]] - datatable[[1]], 30], ConstantArray[0.001, 360]}, PlotRange → All, Joined → {True, True}, Axes → False],
  -((mesarthimGEL * 1211)) Degree], (180 - 15) Degree] (*Tropical*)
(*Mars Effect*)
```





```
Rotate[Rotate[ListPolarPlot[{-MovingAverage[datatable[[6]] - datatable[[1]], 30], ConstantArray[0.001, 360]}, PlotRange → All, Joined → {True, True}, Axes → False],
  - (((mesarthimGEL - ayanamActual) * 1211)) Degree], (180 - 15) Degree] (*Sidereal*)
(*Mars Effect*)
```



Reconstitute signals in the Jupiter data.

```
(*Generate a sample signal*) samplingRate = 360;
(*t=sumtable;*)
t = datatable[[7]];
(*Compute the DFT*)
dft = Fourier[t];

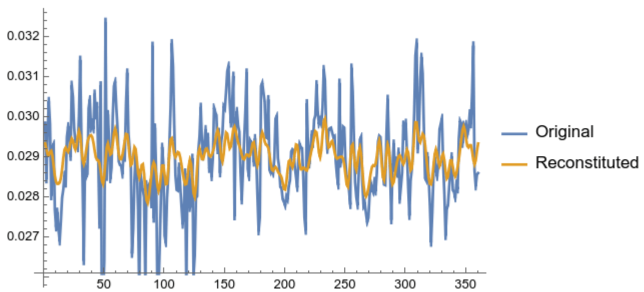
(*Identify peaks-for this example,we'll consider magnitudes greater than a threshold*)
(*threshold=0.008;
peakIndices=Flatten[Position[Abs[dft],_?(#>threshold&)]];*)
length = Length[t];
frequencies = Range[1, Floor[length / 2]] * (samplingRate / length);

threshold = 1;
peakIndices = Flatten[Position[Abs[dft], _ ? (# > 0.002 &)]];
peakIndices = Cases[peakIndices, _ ? (# ≤ 180 &)];
(*Print[peakIndices]
  peakIndices= Flatten[Cases[peakIndices,_?(Floor[#]≥1&)]];
Print[peakIndices]*)
(*Extract values at peakIndices*)
peakFrequencies = frequencies[[peakIndices]];
peakAmplitudes = Abs[dft[[peakIndices]]];
peakPeriods = N[360 / peakFrequencies];
peakPhases = Arg[dft[[peakIndices]]];

(*Zero out non-peak frequencies*)
modifiedDFT = ConstantArray[0 + 0 I, Length[dft]];
modifiedDFT[[peakIndices]] = dft[[peakIndices]];

(*Use InverseFourier to reconstruct the signal*)
reconstitutedWave = Re[InverseFourier[modifiedDFT]];

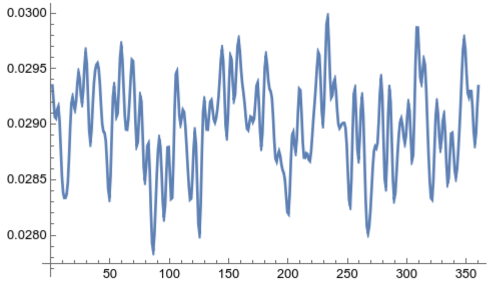
(*Plot the original and reconstituted waves*)
ListLinePlot[{t, reconstitutedWave}, PlotLegends → {"Original", "Reconstituted"}]
```




```
{Mean[t], Mean[reconstitutedWave]}

{0.0289913, 0.0289913}
```

```
ListLinePlot[{reconstitutedWave}]
```




```
(*ListPolarPlot[{reconstitutedWave}]*)

(*Compute the DFT*)dft = Fourier[t];

(*Determine frequency bins*)
length = Length[t];
frequencies = Range[1, Floor[length(*/2*)]] * (samplingRate / length);

(*Extract values at peakIndices*)
peakFrequencies = frequencies[[peakIndices]];
peakAmplitudes = Abs[dft[[peakIndices]]];
peakPeriods = N[360 / peakFrequencies];
peakPhases = Arg[dft[[peakIndices]]];

(*Display the results*)
TableForm[Transpose[{peakFrequencies, peakAmplitudes, peakPeriods, UnitConvert[Quantity[peakPhases, "Radians"], "Degree"]}],
 TableHeadings → {None, {"Frequency (1/Deg)", "Amplitude", "Period (Deg)", "Phase Shift"}}]
```

Frequency (1/Deg)	Amplitude	Period (Deg)	Phase Shift
1	0.550071	360.	0.°
3	0.00264886	120.	9.84002°
4	0.00204316	90.	102.955°
5	0.00351717	72.	-146.926°
6	0.00220274	60.	65.9179°
7	0.00229186	51.4286	-45.1656°
10	0.00394069	36.	-113.094°
11	0.00250396	32.7273	-68.564°
15	0.0022515	24.	4.42936°
16	0.00234964	22.5	-136.541°
21	0.0023367	17.1429	80.3097°
22	0.00300274	16.3636	61.7093°
29	0.00272877	12.4138	58.0306°
36	0.00207088	10.	-124.311°
47	0.00209129	7.65957	142.168°

49	0.00380192	7.34694	-23.6495°
63	0.00221247	5.71429	-54.1181°

```
JupiterWave = Reverse[SortBy[Transpose[{peakPeriods, UnitConvert[Quantity[peakPhases, "Radians"], "Degree"], peakAmplitudes}], Last]]

{{360., 0.°, 0.550071}, {36., -113.094°, 0.00394069}, {7.34694, -23.6495°, 0.00380192}, {72., -146.926°, 0.00351717},
 {16.3636, 61.7093°, 0.00300274}, {12.4138, 58.0306°, 0.00272877}, {120., 9.84002°, 0.00264886}, {32.7273, -68.564°, 0.00250396},
 {22.5, -136.541°, 0.00234964}, {17.1429, 80.3097°, 0.0023367}, {51.4286, -45.1656°, 0.00229186}, {24., 4.42936°, 0.0022515},
 {5.71429, -54.1181°, 0.00221247}, {60., 65.9179°, 0.00220274}, {7.65957, 142.168°, 0.00209129}, {10., -124.311°, 0.00207088}, {90., 102.955°, 0.00204316}}

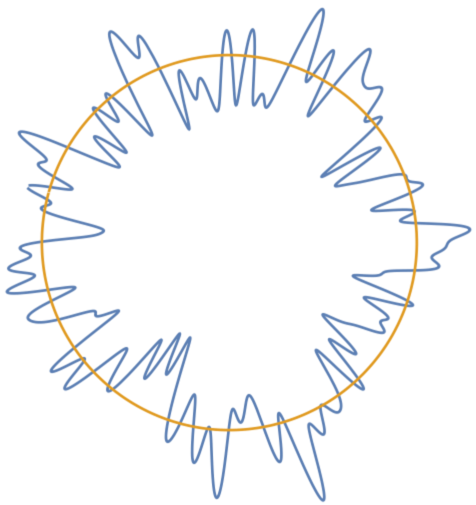
%[[1 ;; 6, 1]]

{360., 36., 7.34694, 72., 16.3636, 12.4138}

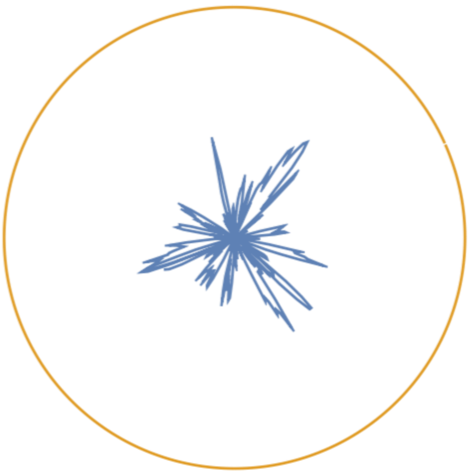
JupiterSumWave = Total[Table[JupiterWave[[i]][[3]] (0.5 + 0.5 Sin[(360 / JupiterWave[[i]][[1]]) * x + (90 - QuantityMagnitude[JupiterWave[[i]][[2]]]) Degree]), {i, 1, Length[JupiterWave]}]];

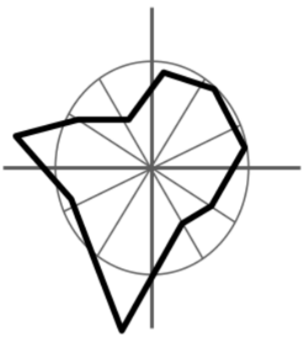
JupiterSumWave1 = Total[Table[JupiterWave[[i]][[3]] (0.5 + 0.5 Sin[(360 / JupiterWave[[i]][[1]]) * x + (90 - QuantityMagnitude[JupiterWave[[i]][[2]]]) Degree]), {i, 2, Length[JupiterWave]}]];

Rotate[PolarPlot[{JupiterSumWave1, 0.022}, {x, 0 Degree, 359 Degree}, Axes → False], (180 - 15) Degree] (*Tropical*)
```

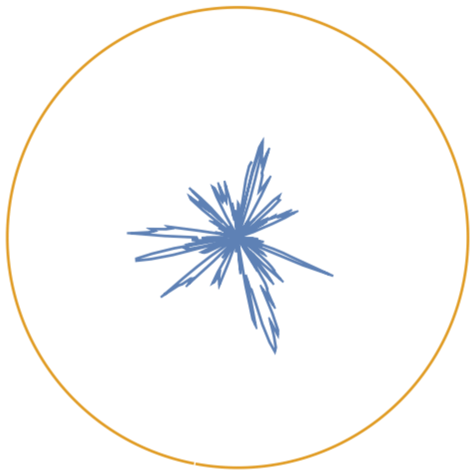


```
Rotate[Rotate[ListPolarPlot[{-MovingAverage[datatable[[7]] - datatable[[1]], 30], ConstantArray[0.001, 360]}, PlotRange → All, Joined → {True, True}, Axes → False],
  -((mesarthimGEL * 1211)) Degree], (180 - 15) Degree] (*Tropical*)
(*Jupiter Effect*)
```





```
Rotate[Rotate[ListPolarPlot[{-MovingAverage[datatable[[7]] - datatable[[1]], 30], ConstantArray[0.001, 360]}, PlotRange → All, Joined → {True, True}, Axes → False],
  -(((mesarthimGEL - ayanamActual) * 1211)) Degree], (180 - 15) Degree] (*Sidereal*)
(*Jupiter Effect*)
```



Reconstitute signals in the Saturn data.

```
(*Generate a sample signal*) samplingRate = 360;
(*t=sumtable;*)
t = datatable⟦8⟧;
(*Compute the DFT*)
dft = Fourier[t];

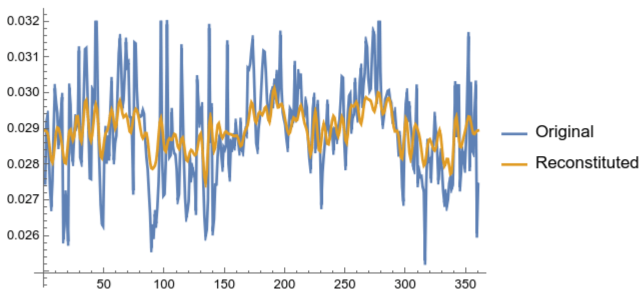
(*Identify peaks-for this example,we'll consider magnitudes greater than a threshold*)
(*threshold=0.008;
peakIndices=Flatten[Position[Abs[dft],_?(#>threshold&)]];*)
length = Length[t];
frequencies = Range[1, Floor[length / 2]] * (samplingRate / length);

threshold = 1;
peakIndices = Flatten[Position[Abs[dft], _? (# > 0.002 &)]];
peakIndices = Cases[peakIndices, _? (# ≤ 180 &)];
(*Print[peakIndices]
  peakIndices= Flatten[Cases[peakIndices,_?(Floor[#]≥1&)]];
Print[peakIndices]*)
(*Extract values at peakIndices*)
peakFrequencies = frequencies⟦peakIndices⟧;
peakAmplitudes = Abs[dft⟦peakIndices⟧];
peakPeriods = N[360 / peakFrequencies];
peakPhases = Arg[dft⟦peakIndices⟧];

(*Zero out non-peak frequencies*)
modifiedDFT = ConstantArray[0 + 0 I, Length[dft]];
modifiedDFT⟦peakIndices⟧ = dft⟦peakIndices⟧;

(*Use InverseFourier to reconstruct the signal*)
reconstitutedWave = Re[InverseFourier[modifiedDFT]];

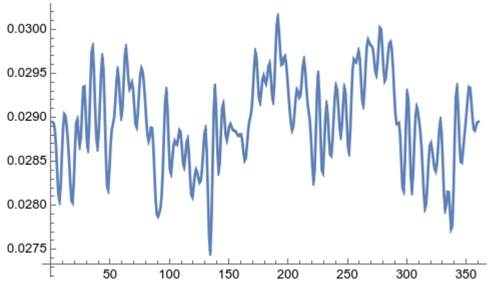
(*Plot the original and reconstituted waves*)
ListLinePlot[{t, reconstitutedWave}, PlotLegends → {"Original", "Reconstituted"}]
```




```
{Mean[t], Mean[reconstitutedWave]}

{0.0289506, 0.0289506}
```

```
ListLinePlot[{reconstitutedWave}]
```




```
(*ListPolarPlot[{reconstitutedWave}]*)

(*Compute the DFT*)dft = Fourier[t];

(*Determine frequency bins*)
length = Length[t];
frequencies = Range[1, Floor[length(*/2*)]] * (samplingRate / length);

(*Extract values at peakIndices*)
peakFrequencies = frequencies[[peakIndices]];
peakAmplitudes = Abs[dft[[peakIndices]]];
peakPeriods = N[360 / peakFrequencies];
peakPhases = Arg[dft[[peakIndices]]];

(*Display the results*)
TableForm[Transpose[{peakFrequencies, peakAmplitudes, peakPeriods, UnitConvert[Quantity[peakPhases, "Radians"], "Degree"]}],
 TableHeadings → {None, {"Frequency (1/Deg)", "Amplitude", "Period (Deg)", "Phase Shift"}}]
```

Frequency (1/Deg)	Amplitude	Period (Deg)	Phase Shift
1	0.5493	360.	0.°
2	0.00426276	180.	-129.024°
3	0.0049399	120.	98.3996°
4	0.00515289	90.	143.786°
5	0.00401235	72.	-4.15059°
6	0.00354912	60.	-83.7127°
10	0.00305934	36.	-93.9011°
11	0.00296044	32.7273	-47.0424°
17	0.00288859	21.1765	-176.301°
20	0.00202604	18.	39.4493°
23	0.00215109	15.6522	-101.682°
26	0.00253963	13.8462	-111.512°
35	0.00378926	10.2857	26.8348°
36	0.00201494	10.	44.0074°
43	0.00286546	8.37209	3.71992°
47	0.00230037	7.65957	157.113°

50	0.00216091	7.2	-156.926°
54	0.00265774	6.66667	23.9684°
63	0.00205878	5.71429	-161.912°

```
SaturnWave = Reverse[SortBy[Transpose[{peakPeriods, UnitConvert[Quantity[peakPhases, "Radians"], "Degree"], peakAmplitudes}], Last]]

{{360., 0.°, 0.5493}, {90., 143.786°, 0.00515289}, {120., 98.3996°, 0.0049399}, {180., -129.024°, 0.00426276}, {72., -4.15059°, 0.00401235},
 {10.2857, 26.8348°, 0.00378926}, {60., -83.7127°, 0.00354912}, {36., -93.9011°, 0.00305934}, {32.7273, -47.0424°, 0.00296044}, {21.1765, -176.301°, 0.00288859},
 {8.37209, 3.71992°, 0.00286546}, {6.66667, 23.9684°, 0.00265774}, {13.8462, -111.512°, 0.00253963}, {7.65957, 157.113°, 0.00230037},
 {7.2, -156.926°, 0.00216091}, {15.6522, -101.682°, 0.00215109}, {5.71429, -161.912°, 0.00205878}, {18., 39.4493°, 0.00202604}, {10., 44.0074°, 0.00201494}}

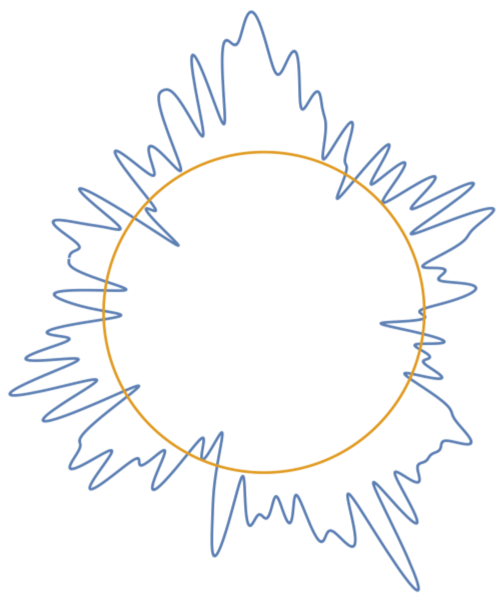
%[[1 ;; 6, 1]]

{360., 90., 120., 180., 72., 10.2857}

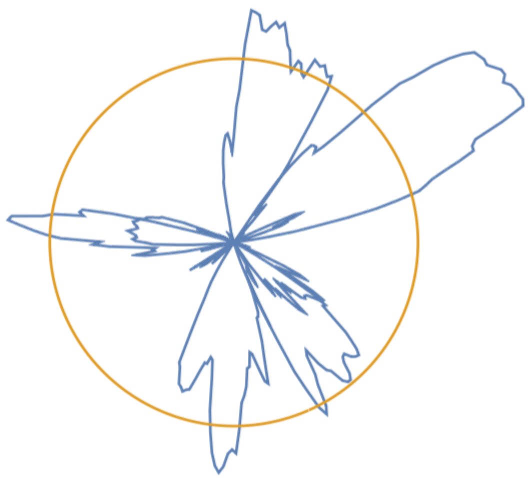
SaturnSumWave = Total[Table[SaturnWave[[i]][[3]] (0.5 + 0.5 Sin[(360 / SaturnWave[[i]][[1]]) * x + (90 - QuantityMagnitude[SaturnWave[[i]][[2]]]) Degree]), {i, 1, Length[SaturnWave]}]];

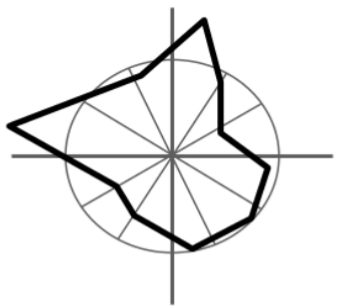
SaturnSumWave1 = Total[Table[SaturnWave[[i]][[3]] (0.5 + 0.5 Sin[(360 / SaturnWave[[i]][[1]]) * x + (90 - QuantityMagnitude[SaturnWave[[i]][[2]]]) Degree]), {i, 2, Length[SaturnWave]}]];

Rotate[PolarPlot[{SaturnSumWave1, 0.022}, {x, 0 Degree, 359 Degree}, Axes → False], (180 - 15) Degree] (*Tropical*)
```

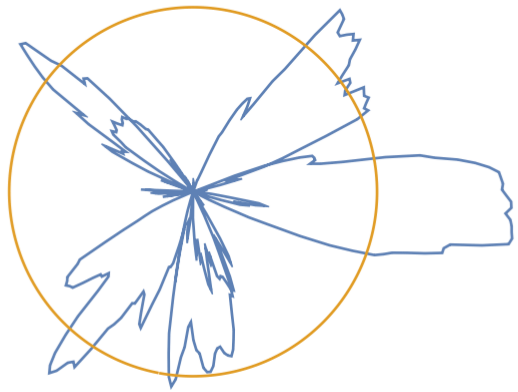


```
Rotate[Rotate[ListPolarPlot[{-MovingAverage[datatable[[8]] - datatable[[1]], 30], ConstantArray[0.001, 360]}, PlotRange → All, Joined → {True, True}, Axes → False],
  - ((mesarthimGEL * 1211)) Degree], (180 - 15) Degree](*Tropical*)
(*Saturn Effect*)
```





```
Rotate[Rotate[ListPolarPlot[{-MovingAverage[datatable[[8]] - datatable[[1]], 30], ConstantArray[0.001, 360]}, PlotRange → All, Joined → {True, True}, Axes → False],
  -(((mesarthimGEL - ayanamActual) * 1211)) Degree], (180 - 15) Degree] (*Sidereal*)
(*Saturn Effect*)
```



Reconstitute signals in the Uranus data.

```
(*Generate a sample signal*) samplingRate = 360;
(*t=sumtable;*)
t = datatable⟦9⟧;
(*Compute the DFT*)
dft = Fourier[t];

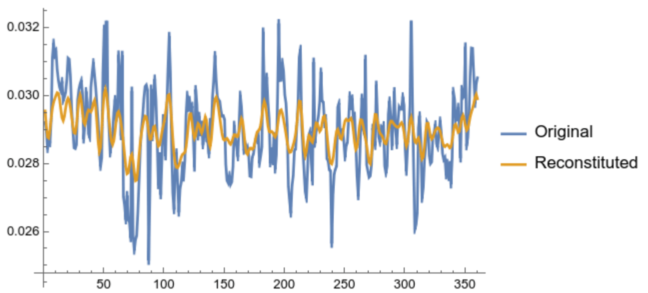
(*Identify peaks-for this example,we'll consider magnitudes greater than a threshold*)
(*threshold=0.008;
peakIndices=Flatten[Position[Abs[dft],_?(#>threshold&)]];*)
length = Length[t];
frequencies = Range[1, Floor[length / 2]] * (samplingRate / length);

threshold = 1;
peakIndices = Flatten[Position[Abs[dft], _? (# > 0.002 &)]];
peakIndices = Cases[peakIndices, _? (# ≤ 180 &)];
(*Print[peakIndices]
  peakIndices= Flatten[Cases[peakIndices,_?(Floor[#]≥1&)]];
Print[peakIndices]*)
(*Extract values at peakIndices*)
peakFrequencies = frequencies⟦peakIndices⟧;
peakAmplitudes = Abs[dft⟦peakIndices⟧];
peakPeriods = N[360 / peakFrequencies];
peakPhases = Arg[dft⟦peakIndices⟧];

(*Zero out non-peak frequencies*)
modifiedDFT = ConstantArray[0 + 0 I, Length[dft]];
modifiedDFT⟦peakIndices⟧ = dft⟦peakIndices⟧;

(*Use InverseFourier to reconstruct the signal*)
reconstitutedWave = Re[InverseFourier[modifiedDFT]];

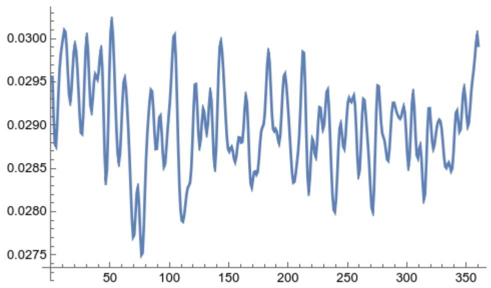
(*Plot the original and reconstituted waves*)
ListLinePlot[{t, reconstitutedWave}, PlotLegends → {"Original", "Reconstituted"}]
```




```
{Mean[t], Mean[reconstitutedWave]}

{0.0289932, 0.0289932}
```

```
ListLinePlot[{reconstitutedWave}]
```




```
(*ListPolarPlot[{reconstitutedWave}]*)

(*Compute the DFT*)dft = Fourier[t];

(*Determine frequency bins*)
length = Length[t];
frequencies = Range[1, Floor[length(*/2*)]] * (samplingRate / length);

(*Extract values at peakIndices*)
peakFrequencies = frequencies⟦peakIndices⟧;
peakAmplitudes = Abs[dft⟦peakIndices⟧];
peakPeriods = N[360 / peakFrequencies];
peakPhases = Arg[dft⟦peakIndices⟧];

(*Display the results*)
TableForm[Transpose[{peakFrequencies, peakAmplitudes, peakPeriods, UnitConvert[Quantity[peakPhases, "Radians"], "Degree"]}],
 TableHeadings → {None, {"Frequency (1/Deg)", "Amplitude", "Period (Deg)", "Phase Shift"}}]
```

Frequency (1/Deg)	Amplitude	Period (Deg)	Phase Shift
1	0.550106	360.	0.°
2	0.002783	180.	14.3922°
3	0.00406895	120.	23.0654°
4	0.00359212	90.	59.6973°
5	0.00298008	72.	84.1945°
8	0.00305927	45.	-67.6796°
9	0.00287329	40.	31.6675°
10	0.0025621	36.	128.304°
12	0.00242898	30.	-79.1148°
16	0.00208128	22.5	170.25°
17	0.0020047	21.1765	151.97°
18	0.00284601	20.	-75.401°
19	0.00201375	18.9474	40.1895°
20	0.00235031	18.	137.419°
21	0.00310253	17.1429	-77.8461°

23	0.00269068	15.6522	-13.5262°
24	0.00249196	15.	-165.029°
28	0.00347114	12.8571	-92.8989°
33	0.00260193	10.9091	-170.288°
35	0.00332767	10.2857	-72.5313°
36	0.00360802	10.	-65.8505°
37	0.00211157	9.72973	48.1682°
48	0.00223289	7.5	-161.611°
52	0.00203984	6.92308	-5.07159°
60	0.0022354	6.	-58.8614°

```
UranusWave = Reverse[SortBy[Transpose[{peakPeriods, UnitConvert[Quantity[peakPhases, "Radians"], "Degree"], peakAmplitudes}], Last]]

{{360., 0.°, 0.550106}, {120., 23.0654°, 0.00406895}, {10., -65.8505°, 0.00360802}, {90., 59.6973°, 0.00359212}, {12.8571, -92.8989°, 0.00347114},
 {10.2857, -72.5313°, 0.00332767}, {17.1429, -77.8461°, 0.00310253}, {45., -67.6796°, 0.00305927}, {72., 84.1945°, 0.00298008}, {40., 31.6675°, 0.00287329},
 {20., -75.401°, 0.00284601}, {180., 14.3922°, 0.002783}, {15.6522, -13.5262°, 0.00269068}, {10.9091, -170.288°, 0.00260193}, {36., 128.304°, 0.0025621},
 {15., -165.029°, 0.00249196}, {30., -79.1148°, 0.00242898}, {18., 137.419°, 0.00235031}, {6., -58.8614°, 0.0022354}, {7.5, -161.611°, 0.00223289},
 {9.72973, 48.1682°, 0.00211157}, {22.5, 170.25°, 0.00208128}, {6.92308, -5.07159°, 0.00203984}, {18.9474, 40.1895°, 0.00201375}, {21.1765, 151.97°, 0.0020047}}

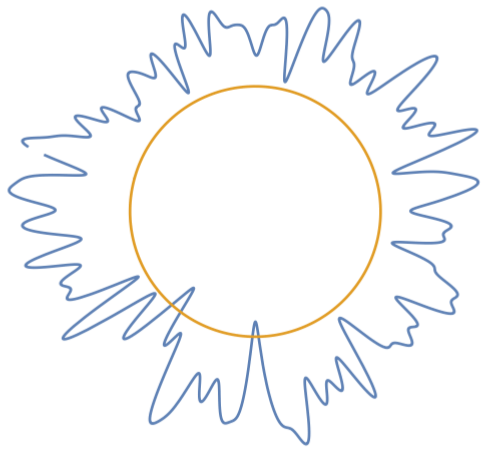
%[[1 ;; 6, 1]]

{360., 120., 10., 90., 12.8571, 10.2857}

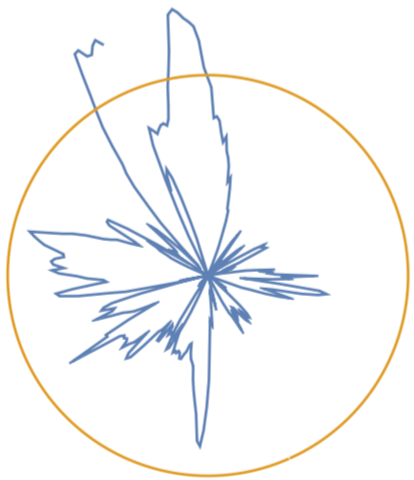
UranusSumWave = Total[Table[UranusWave[[i]][[3]] (0.5 + 0.5 Sin[(360 / UranusWave[[i]][[1]]) * x + (90 - QuantityMagnitude[UranusWave[[i]][[2]]]) Degree]), {i, 1, Length[UranusWave]}]];

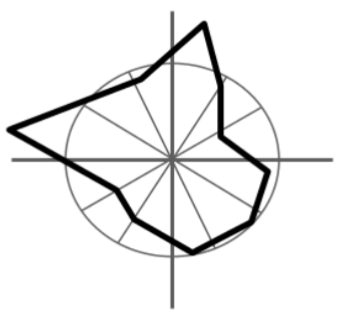
UranusSumWave1 = Total[Table[UranusWave[[i]][[3]] (0.5 + 0.5 Sin[(360 / UranusWave[[i]][[1]]) * x + (90 - QuantityMagnitude[UranusWave[[i]][[2]]]) Degree]), {i, 2, Length[UranusWave]}]];

Rotate[PolarPlot[{UranusSumWave1, 0.022}, {x, 0 Degree, 359 Degree}, Axes → False], (180 - 15) Degree] (*Tropical*)
```

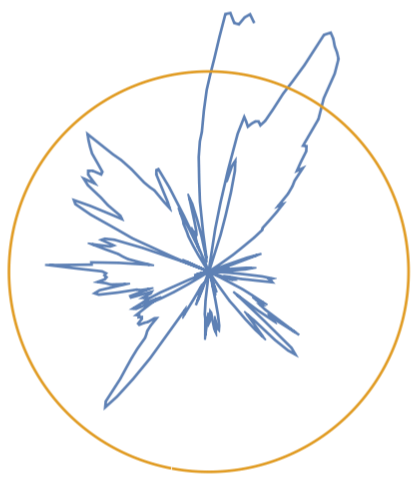


```
Rotate[Rotate[ListPolarPlot[{-MovingAverage[datatable[[9]] - datatable[[1]], 30], ConstantArray[0.001, 360]}, PlotRange → All, Joined → {True, True}, Axes → False],
  -((mesarthimGEL * 1211)) Degree], (180 - 15) Degree] (*Tropical*)
(*Uranus Effect*)
```





```
Rotate[Rotate[ListPolarPlot[{-MovingAverage[datatable[[9]] - datatable[[1]], 30], ConstantArray[0.001, 360]}, PlotRange → All, Joined → {True, True}, Axes → False],
  -(((mesarthimGEL - ayanamActual) * 1211)) Degree], (180 - 15) Degree] (*Sidereal*)
(*Uranus Effect*)
```



Reconstitute signals in the Neptune data.

```
(*Generate a sample signal*) samplingRate = 360;
(*t=sumtable;*)
t = datatable[[10]];
(*Compute the DFT*)
dft = Fourier[t];

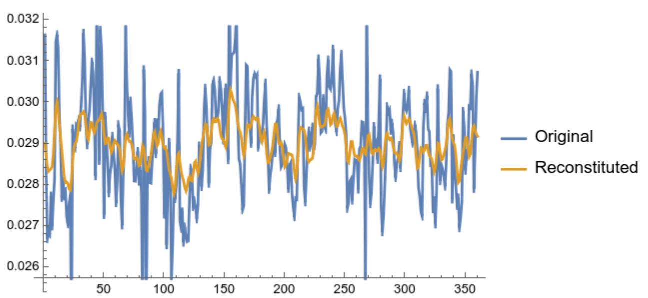
(*Identify peaks-for this example,we'll consider magnitudes greater than a threshold*)
(*threshold=0.008;
peakIndices=Flatten[Position[Abs[dft],_?(#>threshold&)]];*)
length = Length[t];
frequencies = Range[1, Floor[length / 2]] * (samplingRate / length);

threshold = 1;
peakIndices = Flatten[Position[Abs[dft], _? (# > 0.002 &)]];
peakIndices = Cases[peakIndices, _? (# ≤ 180 &)];
(*Print[peakIndices]
  peakIndices= Flatten[Cases[peakIndices,_?(Floor[#]≥1&)]];
Print[peakIndices]*)
(*Extract values at peakIndices*)
peakFrequencies = frequencies[[peakIndices]];
peakAmplitudes = Abs[dft[[peakIndices]]];
peakPeriods = N[360 / peakFrequencies];
peakPhases = Arg[dft[[peakIndices]]];

(*Zero out non-peak frequencies*)
modifiedDFT = ConstantArray[0 + 0 I, Length[dft]];
modifiedDFT[[peakIndices]] = dft[[peakIndices]];

(*Use InverseFourier to reconstruct the signal*)
reconstitutedWave = Re[InverseFourier[modifiedDFT]];

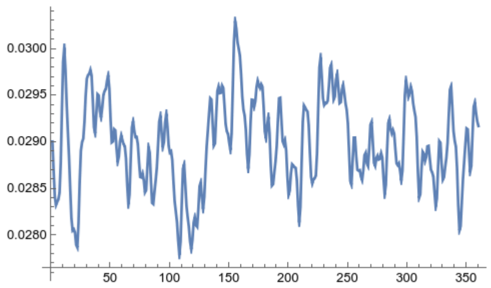
(*Plot the original and reconstituted waves*)
ListLinePlot[{t, reconstitutedWave}, PlotLegends → {"Original", "Reconstituted"}]
```




```
{Mean[t], Mean[reconstitutedWave]}

{0.0289846, 0.0289846}
```

```
ListLinePlot[{reconstitutedWave}]
```




```
(*ListPolarPlot[{reconstitutedWave}]*)

(*Compute the DFT*)dft = Fourier[t];

(*Determine frequency bins*)
length = Length[t];
frequencies = Range[1, Floor[length(*/2*)]] * (samplingRate / length);

(*Extract values at peakIndices*)
peakFrequencies = frequencies[[peakIndices]];
peakAmplitudes = Abs[dft[[peakIndices]]];
peakPeriods = N[360 / peakFrequencies];
peakPhases = Arg[dft[[peakIndices]]];

(*Display the results*)
TableForm[Transpose[{peakFrequencies, peakAmplitudes, peakPeriods, UnitConvert[Quantity[peakPhases, "Radians"], "Degree"]}],
 TableHeadings → {None, {"Frequency (1/Deg)", "Amplitude", "Period (Deg)", "Phase Shift"}}]
```

Frequency (1/Deg)	Amplitude	Period (Deg)	Phase Shift
1	0.549944	360.	0.°
2	0.00229521	180.	-140.872°
3	0.0028024	120.	37.2608°
4	0.0038402	90.	117.987°
5	0.00412231	72.	-124.725°
6	0.00327593	60.	78.086°
7	0.00225315	51.4286	-88.988°
8	0.00361463	45.	-90.7457°
9	0.00205452	40.	23.2086°
12	0.0025468	30.	48.8371°
13	0.00219882	27.6923	50.3785°
18	0.00221326	20.	139.665°
19	0.00278246	18.9474	-125.675°
21	0.00375466	17.1429	-118.564°
22	0.0021432	16.3636	-162.357°
23	0.00240771	15.6522	-125.196°

26	0.00247867	13.8462	-57.8879°
31	0.00205842	11.6129	-24.2056°
33	0.00252594	10.9091	-15.8693°
36	0.00283707	10.	-62.4591°
51	0.00262882	7.05882	138.087°
76	0.00221797	4.73684	-21.8124°

```
NeptuneWave = Reverse[SortBy[Transpose[{peakPeriods, UnitConvert[Quantity[peakPhases, "Radians"], "Degree"], peakAmplitudes}], Last]]

{{360., 0.°, 0.549944}, {72., -124.725°, 0.00412231}, {90., 117.987°, 0.0038402}, {17.1429, -118.564°, 0.00375466},
 {45., -90.7457°, 0.00361463}, {60., 78.086°, 0.00327593}, {10., -62.4591°, 0.00283707}, {120., 37.2608°, 0.0028024}, {18.9474, -125.675°, 0.00278246},
 {7.05882, 138.087°, 0.00262882}, {30., 48.8371°, 0.0025468}, {10.9091, -15.8693°, 0.00252594}, {13.8462, -57.8879°, 0.00247867},
 {15.6522, -125.196°, 0.00240771}, {180., -140.872°, 0.00229521}, {51.4286, -88.988°, 0.00225315}, {4.73684, -21.8124°, 0.00221797},
 {20., 139.665°, 0.00221326}, {27.6923, 50.3785°, 0.00219882}, {16.3636, -162.357°, 0.0021432}, {11.6129, -24.2056°, 0.00205842}, {40., 23.2086°, 0.00205452}}

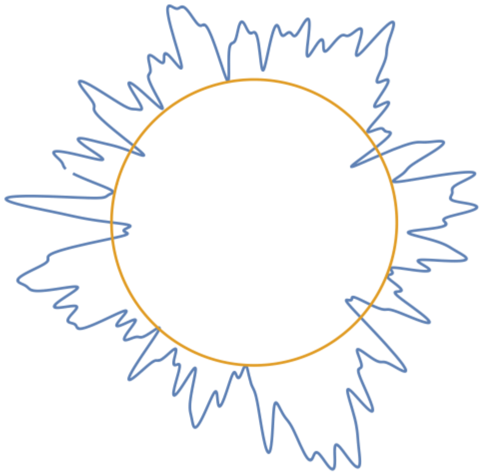
%[[1 ;; 6, 1]]

{360., 72., 90., 17.1429, 45., 60.}

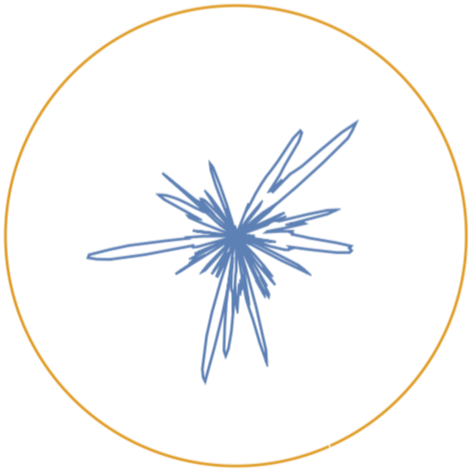
NeptuneSumWave = Total[Table[NeptuneWave[[i]][[3]] (0.5 + 0.5 Sin[(360 / NeptuneWave[[i]][[1]]) * x + (90 - QuantityMagnitude[NeptuneWave[[i]][[2]]]) Degree]), {i, 1, Length[NeptuneWave]}]];

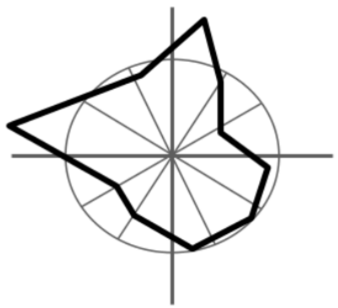
NeptuneSumWave1 = Total[Table[NeptuneWave[[i]][[3]] (0.5 + 0.5 Sin[(360 / NeptuneWave[[i]][[1]]) * x + (90 - QuantityMagnitude[NeptuneWave[[i]][[2]]]) Degree]), {i, 2, Length[NeptuneWave]}]];

Rotate[PolarPlot[{NeptuneSumWave1, 0.022}, {x, 0 Degree, 359 Degree}, Axes → False], (180 - 15) Degree] (*Tropical*)
```

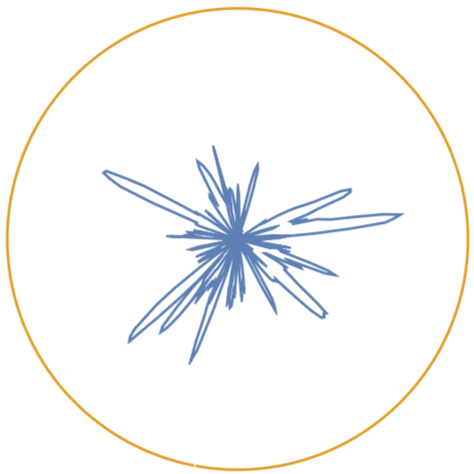


```
Rotate[Rotate[ListPolarPlot[{-MovingAverage[datatable[[10]] - datatable[[1]], 30], ConstantArray[0.001, 360]}, PlotRange → All, Joined → {True, True}, Axes → False],
  -((mesarthimGEL * 1211)) Degree], (180 - 15) Degree](*Tropical*)
(*Neptune Effect*)
```





```
Rotate[Rotate[ListPolarPlot[{-MovingAverage[datatable[[10]] - datatable[[1]], 30], ConstantArray[0.001, 360]}, PlotRange → All, Joined → {True, True}, Axes → False],
  - (((mesarthimGEL - ayanamActual) * 1211)) Degree], (180 - 15) Degree] (*Sidereal*)
(*Neptune Effect*)
```



Reconstitute signals in the Pluto data.

```
(*Generate a sample signal*) samplingRate = 360;
(*t=sumtable;*)
t = datatable[[11]];
(*Compute the DFT*)
dft = Fourier[t];

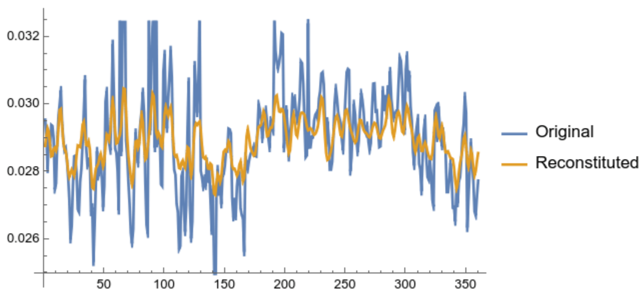
(*Identify peaks-for this example,we'll consider magnitudes greater than a threshold*)
(*threshold=0.008;
peakIndices=Flatten[Position[Abs[dft],_?(#>threshold&)]];*)
length = Length[t];
frequencies = Range[1, Floor[length/2]] * (samplingRate/length);

threshold = 1;
peakIndices = Flatten[Position[Abs[dft], _?(# > 0.002 &)]];
peakIndices = Cases[peakIndices, _?(# ≤ 180 &)];
(*Print[peakIndices]
  peakIndices= Flatten[Cases[peakIndices,_?(Floor[#]≥1&)]];
Print[peakIndices]*)
(*Extract values at peakIndices*)
peakFrequencies = frequencies[[peakIndices]];
peakAmplitudes = Abs[dft[[peakIndices]]];
peakPeriods = N[360/peakFrequencies];
peakPhases = Arg[dft[[peakIndices]]];

(*Zero out non-peak frequencies*)
modifiedDFT = ConstantArray[0 + 0 I, Length[dft]];
modifiedDFT[[peakIndices]] = dft[[peakIndices]];

(*Use InverseFourier to reconstruct the signal*)
reconstitutedWave = Re[InverseFourier[modifiedDFT]];

(*Plot the original and reconstituted waves*)
ListLinePlot[{t, reconstitutedWave}, PlotLegends → {"Original", "Reconstituted"}]
```




```
{Mean[t], Mean[reconstitutedWave]}

{0.0289297, 0.0289297}
```

```
(*Compute the DFT*)dft = Fourier[t];

(*Determine frequency bins*)
length = Length[t];
frequencies = Range[1, Floor[length(*/2*)]] * (samplingRate / length);

(*Extract values at peakIndices*)
peakFrequencies = frequencies[[peakIndices]];
peakAmplitudes = Abs[dft[[peakIndices]]];
peakPeriods = N[360 / peakFrequencies];
peakPhases = Arg[dft[[peakIndices]]];

(*Display the results*)
TableForm[Transpose[{peakFrequencies, peakAmplitudes, peakPeriods, UnitConvert[Quantity[peakPhases, "Radians"], "Degree"]}],
 TableHeadings → {None, {"Frequency (1/Deg)", "Amplitude", "Period (Deg)", "Phase Shift"}}]
```

Frequency (1/Deg)	Amplitude	Period (Deg)	Phase Shift
1	0.548903	360.	0.°
2	0.00567249	180.	-115.923°
3	0.00601232	120.	138.135°
4	0.00483281	90.	-128.874°
5	0.00432709	72.	50.5094°
7	0.00205065	51.4286	28.2923°
9	0.00255073	40.	77.6146°
10	0.0030105	36.	126.277°
12	0.00392545	30.	-48.4288°
13	0.00313112	27.6923	40.5787°
16	0.00359412	22.5	136.319°
17	0.00371118	21.1765	-152.132°
19	0.00296509	18.9474	158.656°
21	0.00231694	17.1429	-106.351°
23	0.00241376	15.6522	5.6261°
25	0.00275148	14.4	28.5141°
29	0.00301047	12.4138	15.7241°
30	0.00333567	12.	94.1185°
32	0.00309822	11.25	-89.505°
33	0.00249097	10.9091	22.8232°
34	0.0020917	10.5882	18.2707°
36	0.00273916	10.	148.874°
42	0.00237969	8.57143	123.178°
47	0.0022782	7.65957	124.169°
50	0.0022261	7.2	-8.38883°
59	0.00218788	6.10169	19.1128°
75	0.00240854	4.8	168.748°
76	0.00218761	4.73684	-115.387°

```
PlutoWave = Reverse[SortBy[Transpose[{peakPeriods, UnitConvert[Quantity[peakPhases, "Radians"], "Degree"], peakAmplitudes}], Last]]

{{360., 0.°, 0.548903}, {120., 138.135°, 0.00601232}, {180., -115.923°, 0.00567249}, {90., -128.874°, 0.00483281}, {72., 50.5094°, 0.00432709},
 {30., -48.4288°, 0.00392545}, {21.1765, -152.132°, 0.00371118}, {22.5, 136.319°, 0.00359412}, {12., 94.1185°, 0.00333567}, {27.6923, 40.5787°, 0.00313112},
 {11.25, -89.505°, 0.00309822}, {36., 126.277°, 0.0030105}, {12.4138, 15.7241°, 0.00301047}, {18.9474, 158.656°, 0.00296509}, {14.4, 28.5141°, 0.00275148},
 {10., 148.874°, 0.00273916}, {40., 77.6146°, 0.00255073}, {10.9091, 22.8232°, 0.00249097}, {15.6522, 5.6261°, 0.00241376}, {4.8, 168.748°, 0.00240854},
 {8.57143, 123.178°, 0.00237969}, {17.1429, -106.351°, 0.00231694}, {7.65957, 124.169°, 0.0022782}, {7.2, -8.38883°, 0.0022261},
 {6.10169, 19.1128°, 0.00218788}, {4.73684, -115.387°, 0.00218761}, {10.5882, 18.2707°, 0.0020917}, {51.4286, 28.2923°, 0.00205065}}

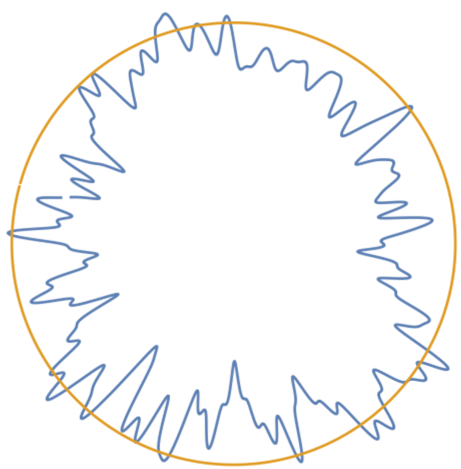
%[[1 ;; 6, 1]]

{360., 120., 180., 90., 72., 30.}

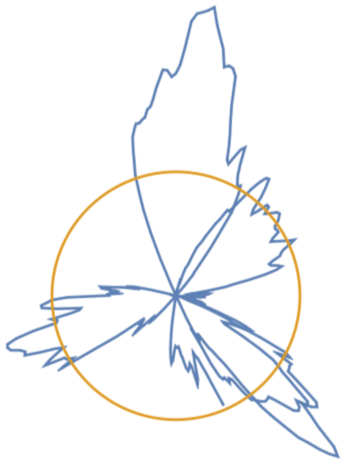
plutoSumWave = Total[Table[PlutoWave[[i]][[3]] (0.5 + 0.5 Sin[(360 / PlutoWave[[i]][[1]]) * x + (90 - QuantityMagnitude[PlutoWave[[i]][[2]]]) Degree]), {i, 1, Length[PlutoWave]}]];

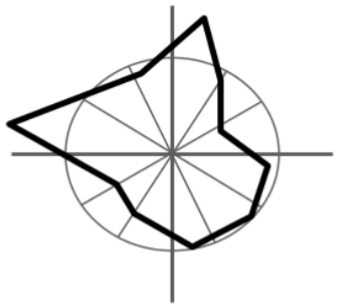
plutoSumWave1 = Total[Table[PlutoWave[[i]][[3]] (0.5 + 0.5 Sin[(360 / PlutoWave[[i]][[1]]) * x + (90 - QuantityMagnitude[PlutoWave[[i]][[2]]]) Degree]), {i, 2, Length[PlutoWave]}]];

Rotate[PolarPlot[{plutoSumWave1, 0.05}, {x, 0 Degree, 359 Degree}, Axes → False], (180 - 15) Degree] (*Tropical*)
```

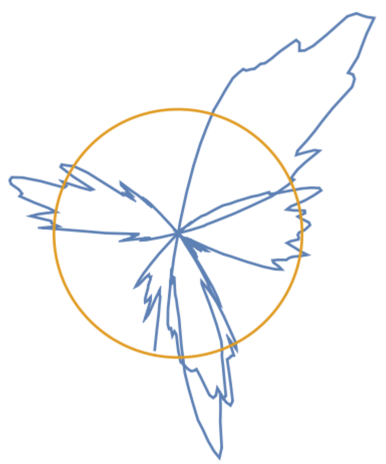


```
Rotate[Rotate[ListPolarPlot[{-MovingAverage[datatable[[11]] - datatable[[1]], 30], ConstantArray[0.001, 360]}, PlotRange → All, Joined → {True, True}, Axes → False],
  -((mesarthimGEL * 1211)) Degree], (180 - 15) Degree] (*Tropical*)
(*Pluto Effect*)
```



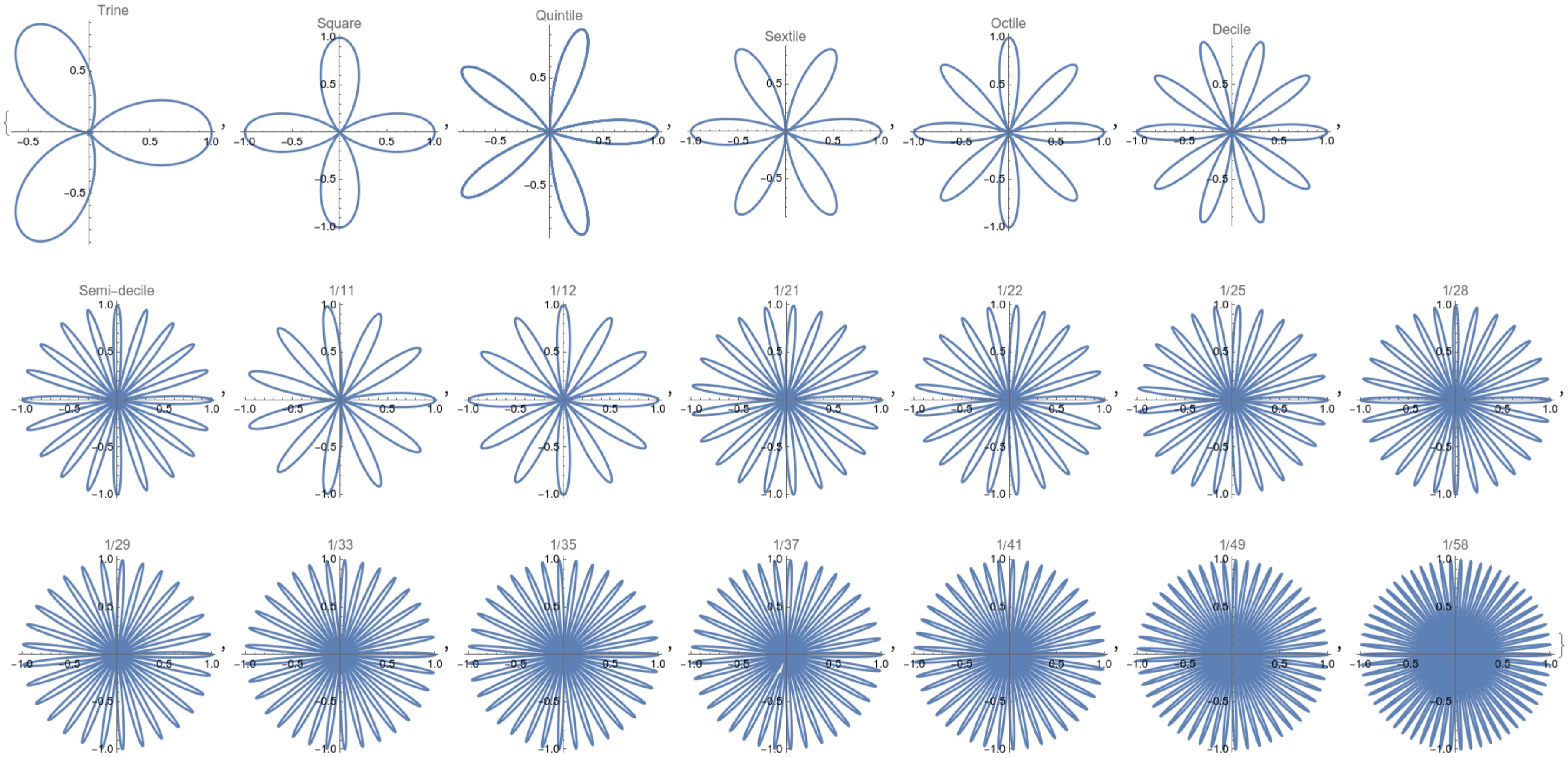


```
Rotate[Rotate[ListPolarPlot[{-MovingAverage[datatable[[11]] - datatable[[1]], 30], ConstantArray[0.001, 360]}, PlotRange → All, Joined → {True, True}, Axes → False],
  -(((mesarthimGEL - ayanamActual) * 1211)) Degree], (180 - 15) Degree] (*Sidereal*)
(*Pluto Effect*)
```



Note that Fourier Transforms of filtered data show frequency peaks, the periods of which match the divisors of major astrological angles (trines, squares, quintiles, deciles, Golden angles)

```
polartable = {PolarPlot[(0.5 + 0.5 Sin[3 x + 90 Degree]), {x, 0 Degree, 359 Degree}, ImageSize → Small, PlotLabel → "Trine"] (*Trine*),
  PolarPlot[(0.5 + 0.5 Sin[4 x + (90) Degree]), {x, 0 Degree, 359 Degree}, ImageSize → Small, PlotLabel → "Square"] (*Square*),
  PolarPlot[Sin[5 x + (90) Degree], {x, 0 Degree, 360 Degree}, ImageSize → Small, PlotLabel → "Quintile"] (*Quintile*),
  PolarPlot[(0.5 + 0.5 Sin[6 x + (90) Degree]), {x, 0 Degree, 360 Degree}, ImageSize → Small, PlotLabel → "Sextile"] (*Sextile*),
  PolarPlot[(0.5 + 0.5 Sin[8 x + (90) Degree]), {x, 0 Degree, 360 Degree}, ImageSize → Small, PlotLabel → "Octile"] (*Octile*),
  PolarPlot[(0.5 + 0.5 Sin[10 x + 90 Degree]), {x, 0 Degree, 360 Degree}, ImageSize → Small, PlotLabel → "Decile"] (*Decile*),
  PolarPlot[(0.5 + 0.5 Sin[20 x + (90 (*36+(360/20)*)) Degree]), {x, 0 Degree, 360 Degree}, ImageSize → Small, PlotLabel → "Semi-decile"] (*Semi-Decile*),
  PolarPlot[(0.5 + 0.5 Sin[11 x + (90 (*36+(360/20)*)) Degree]), {x, 0 Degree, 360 Degree}, ImageSize → Small, PlotLabel → "1/11"] (*1/11*),
  PolarPlot[(0.5 + 0.5 Sin[12 x + (90 (*36+(360/20)*)) Degree]), {x, 0 Degree, 360 Degree}, ImageSize → Small, PlotLabel → "1/12"] (*1/12*),
  PolarPlot[(0.5 + 0.5 Sin[21 x + (90 (*36+(360/20)*)) Degree]), {x, 0 Degree, 360 Degree}, ImageSize → Small, PlotLabel → "1/21"] (*1/21*),
  PolarPlot[(0.5 + 0.5 Sin[21 x + (90 (*36+(360/20)*)) Degree]), {x, 0 Degree, 360 Degree}, ImageSize → Small, PlotLabel → "1/22"] (*1/22*),
  PolarPlot[(0.5 + 0.5 Sin[25 x + (90 (*36+(360/20)*)) Degree]), {x, 0 Degree, 360 Degree}, ImageSize → Small, PlotLabel → "1/25"] (*1/25*),
  PolarPlot[(0.5 + 0.5 Sin[28 x + (90 (*36+(360/20)*)) Degree]), {x, 0 Degree, 360 Degree}, ImageSize → Small, PlotLabel → "1/28"] (*1/28*),
  PolarPlot[(0.5 + 0.5 Sin[29 x + (90 (*36+(360/20)*)) Degree]), {x, 0 Degree, 360 Degree}, ImageSize → Small, PlotLabel → "1/29"] (*1/29*),
  PolarPlot[(0.5 + 0.5 Sin[33 x + (90 (*36+(360/20)*)) Degree]), {x, 0 Degree, 360 Degree}, ImageSize → Small, PlotLabel → "1/33"] (*1/33*),
  PolarPlot[(0.5 + 0.5 Sin[35 x + (90 (*36+(360/20)*)) Degree]), {x, 0 Degree, 360 Degree}, ImageSize → Small, PlotLabel → "1/35"] (*1/35*),
  PolarPlot[(0.5 + 0.5 Sin[37 x + (90 (*36+(360/20)*)) Degree]), {x, 0 Degree, 360 Degree}, ImageSize → Small, PlotLabel → "1/37"] (*1/37*),
  PolarPlot[(0.5 + 0.5 Sin[41 x + (90 (*36+(360/20)*)) Degree]), {x, 0 Degree, 360 Degree}, ImageSize → Small, PlotLabel → "1/41"] (*1/41*),
  PolarPlot[(0.5 + 0.5 Sin[49 x + (90 (*36+(360/20)*)) Degree]), {x, 0 Degree, 360 Degree}, ImageSize → Small, PlotLabel → "1/49"] (*1/49*),
  PolarPlot[(0.5 + 0.5 Sin[58 x + (90 (*36+(360/20)*)) Degree]), {x, 0 Degree, 360 Degree}, ImageSize → Small, PlotLabel → "1/58"] (*1/28*)
 }
```




```
(*Table[Export["polargraph"<>{"trine","square","quintile","sextile","GA7","decile","GA14","GA16","GA17","GA33","GA60","GA360"}[[i]]<>".png",polartable[[i]]],{i,12}]*)
```

Golden angles look like forms in nature, like daisies, in contrast to the stiffer aesthetics of the major astrological angles.

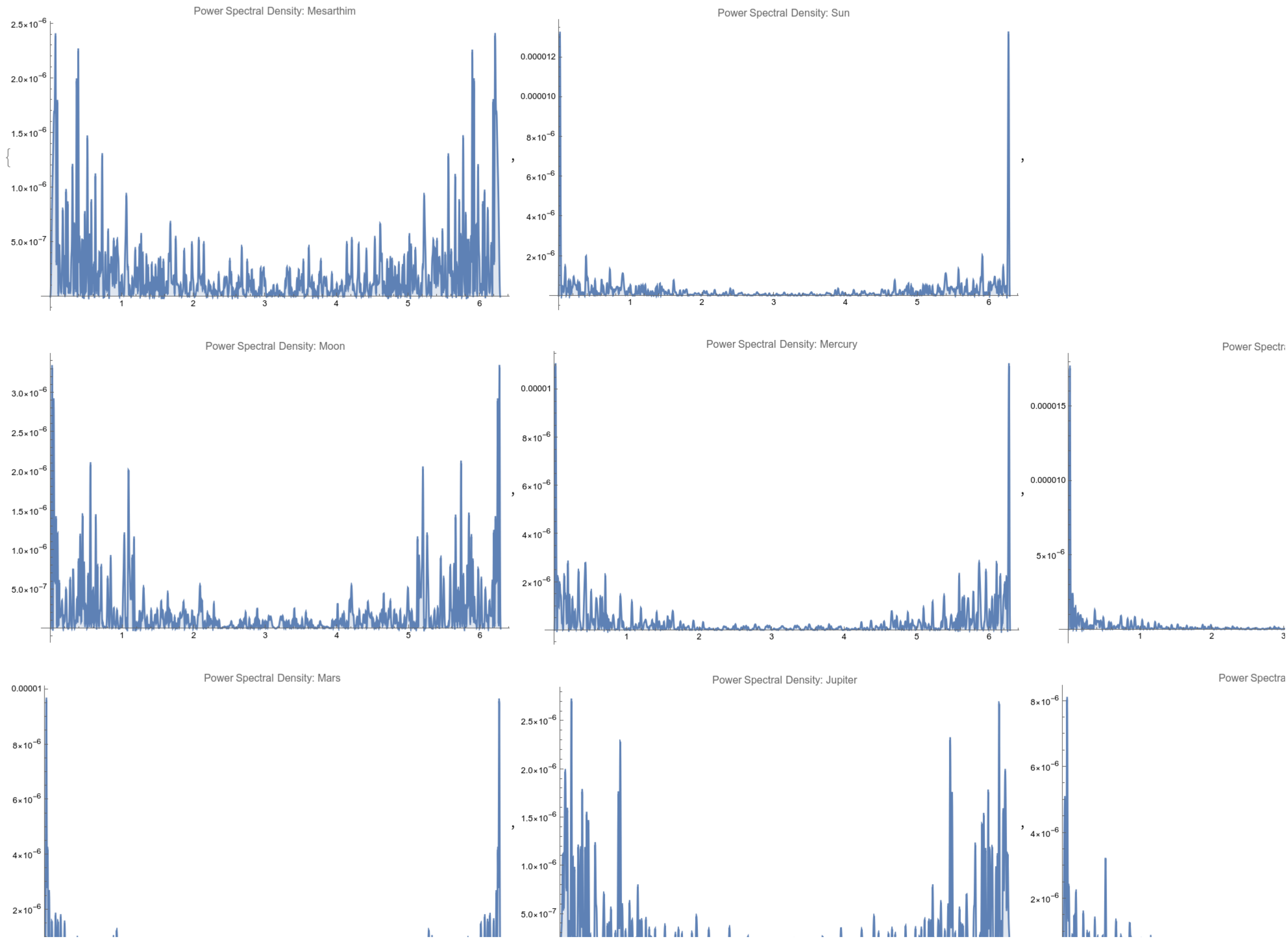
Note that zero degrees is to the right in default mathematics, whereas in astrology zero degrees tends to be to the left. Reflecting this fact, the final addition of these waves are rotated to the left.

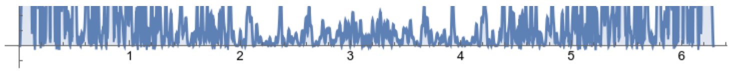
When you add the main angles together (weighing them by multiplying by the number of planets represented and skipping the Golden angles and Mesarthim for now) with an appropriately sized reference circle for convenience, you get something like the famous Gauquelin sectors image.

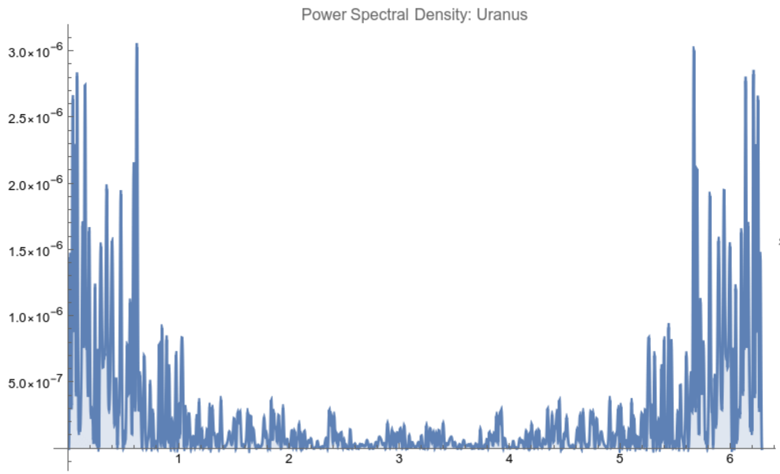
More advanced wave analysis

Look at power spectral densities of filtered data to visually see peak frequencies at a glance.

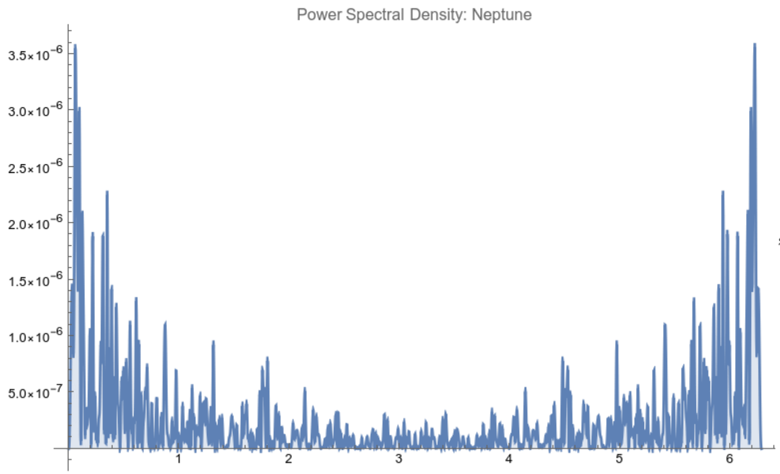
```
psdtable = Table[Plot[PowerSpectralDensity[TimeSeries[datatable[[j]], ω , FourierParameters → {-1, 1}], {ω , 0, 2 Pi}, Filling → Axis, PlotRange → All,
   ImageSize → Large, PlotLabel → "Power Spectral Density: " <> CommonName[specialpointsentities[[j]]], PlotRange → Full, PlotRange → {{0, 0.00002}, {0, 0.00002}},
   PlotRangeClipping → False], {j, Length[specialpointsentities]}](*SUN MERCURY VENUS ARE highest MAXIMUM frequencies (all benefics); MARS,
 SATURN, & PLUTO ARE SECOND (all malefics): perhaps this is the difference between articles that are good news vs. bad news; at the very least,
 this offers a new hypothesis and avenue for subsequent study, namely classifying the articles as favorable or unfavorable,
 grouping them thus and seeing if there are different sets of peak frequencies in each group that make sense astrologically*)
```


Power Spectral Density: Mesarthim
Power Spectral Density: Sun
Power Spectral Density: Moon
Power Spectral Density: Mercury
Power Spectr
Power Spectral Density: Mars
Power Spectral Density: Jupiter
Power Spectra

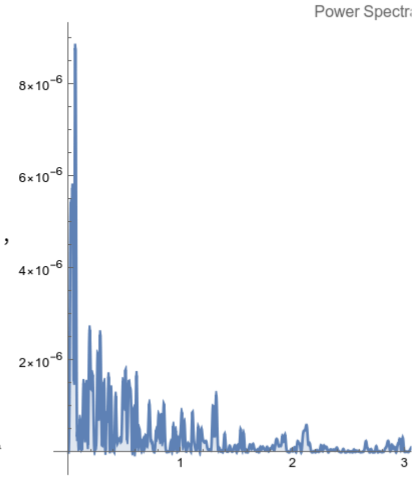




,



,




```
(*Table[Export["PSD"<>CommonName[specialpointsentities[[i]]]<>".png",psdtable[[i]]],{i,11}]*)
```

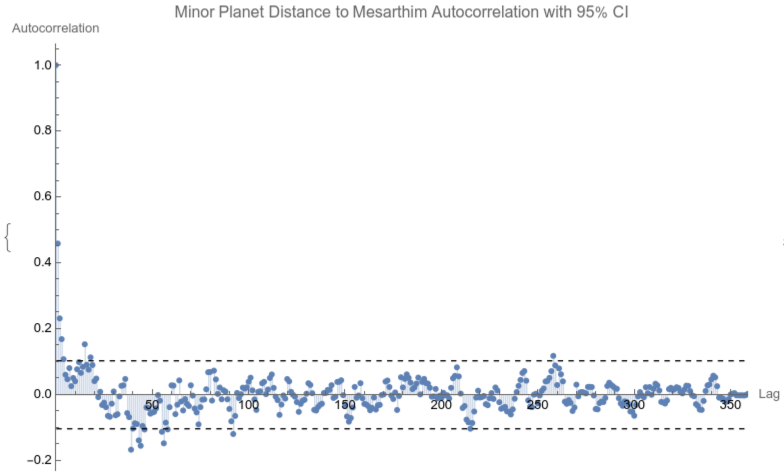
Create an ACF (autocorrelation function) plot with confidence bands as confirmation of complete list of periodicities that are beyond white noise with 95% confidence.

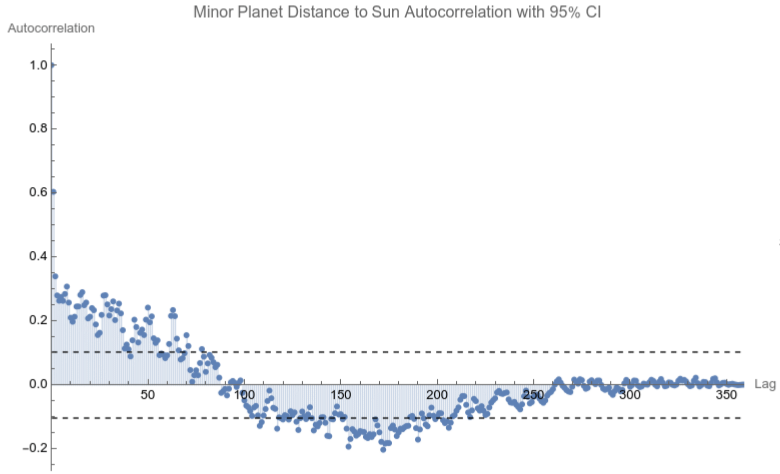
```
acf[data_, lmax_, k_, clev_ : 0.95] :=
 Show[ListPlot[CorrelationFunction[data, {0, lmax}], Filling → Axis, PlotRange → {{0, lmax}, All}, PlotStyle → PointSize[Medium],
   PlotLabel → "Minor Planet Distance to " <> CommonName[specialpointsentities[[k]]] <> " Autocorrelation with 95% CI"(*<>
    ToString[Union[Abs[(Quantile[NormalDistribution[],{(1-clev)/2,1-(1-clev)/2}]/Sqrt[data["PathLengths"][[1]]])]][[1]]*), ImageSize → Large,
   AxesLabel → {"Lag", "Autocorrelation"}],
  Graphics[{Dashed, Line[{{0, #}, {lmax, #}}]}] & /@ (Quantile[NormalDistribution[], {(1 - clev) / 2, 1 - (1 - clev) / 2}] / Sqrt[data["PathLengths"][[1]]])]

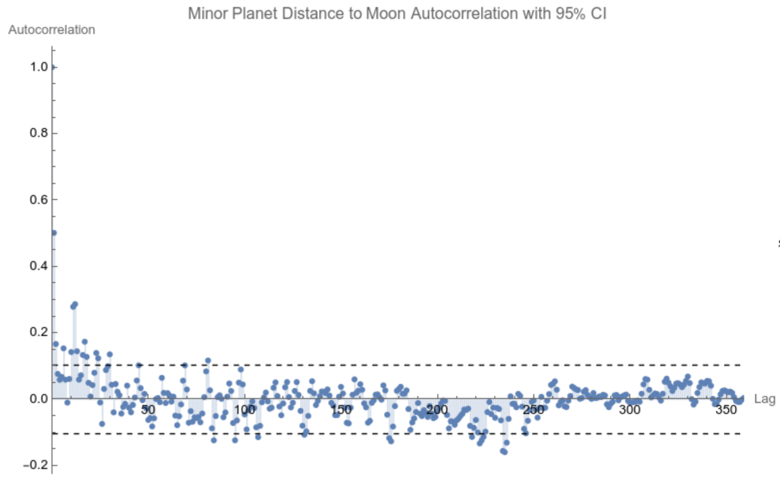
Union[Abs[(Quantile[NormalDistribution[], {(1 - 0.95) / 2, 1 - (1 - 0.95) / 2}] / Sqrt[TimeSeries[datatable[[1]]]["PathLengths"][[1]]])]][[1]]

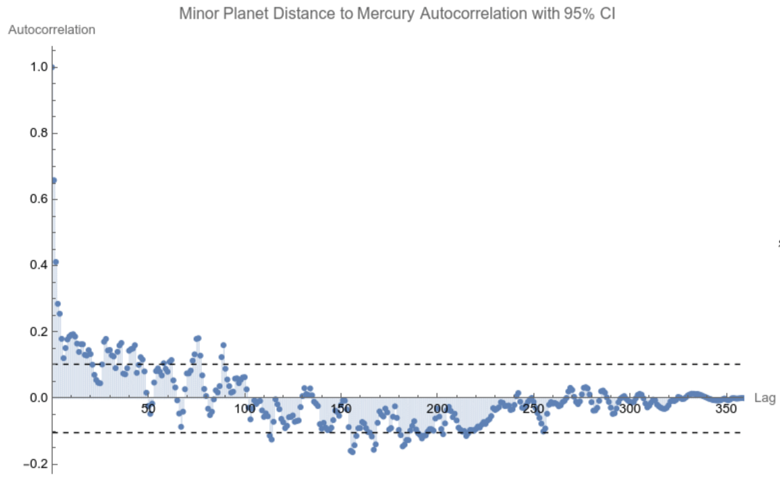
0.103299

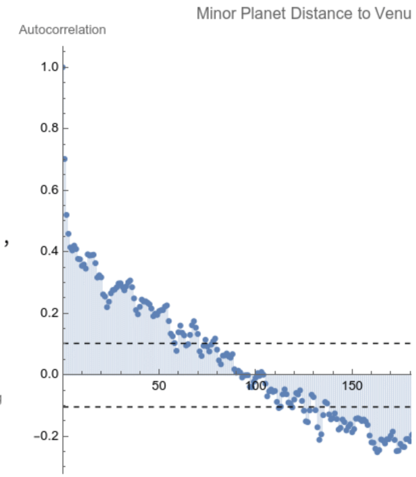
acftable = Table[acf[TimeSeries[datatable[[j]]], 359, j, .95], {j, Length[specialpointsentities]}]
```

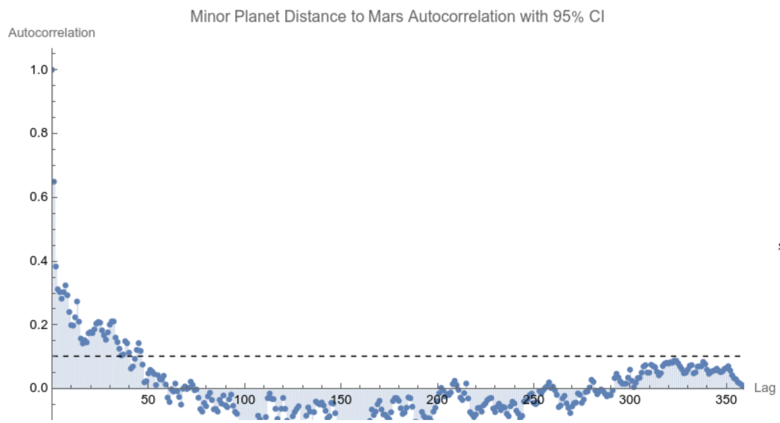

Minor Planet Distance to Mesarthim Autocorrelation with 95% CI
Autocorrelation
Lag

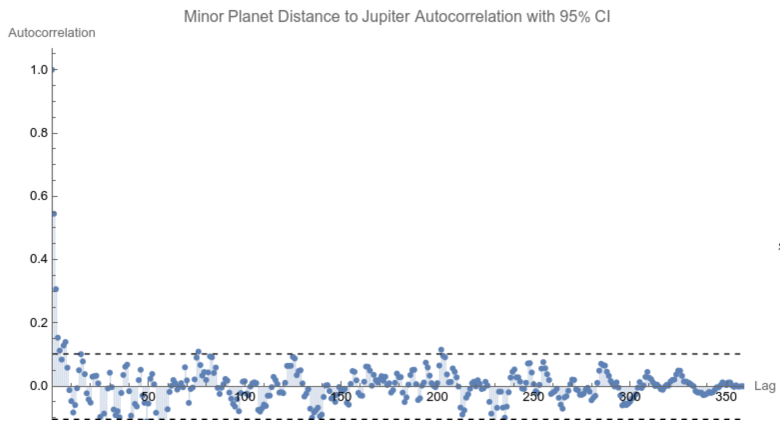

Minor Planet Distance to Sun Autocorrelation with 95% CI
Autocorrelation
Lag

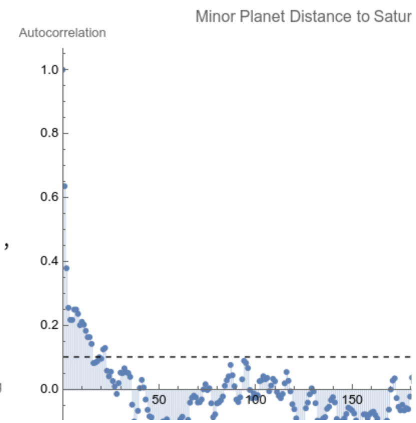

Minor Planet Distance to Moon Autocorrelation with 95% CI
Autocorrelation
Lag

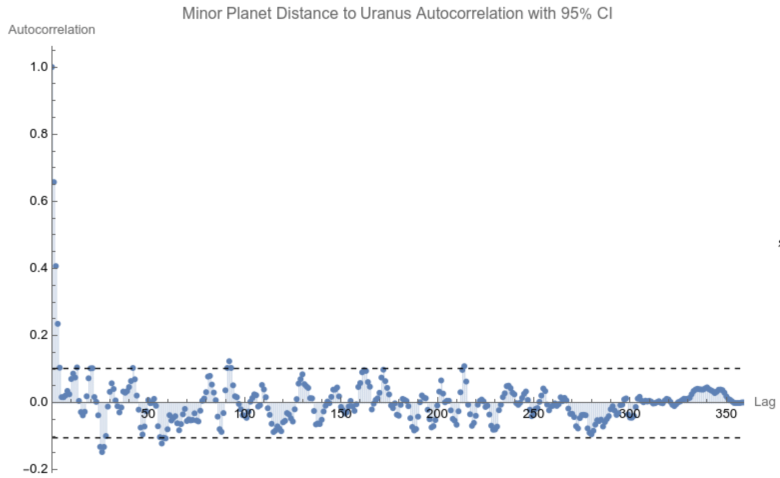

Minor Planet Distance to Mercury Autocorrelation with 95% CI
Autocorrelation
Lag


Minor Planet Distance to Venu
Autocorrelation

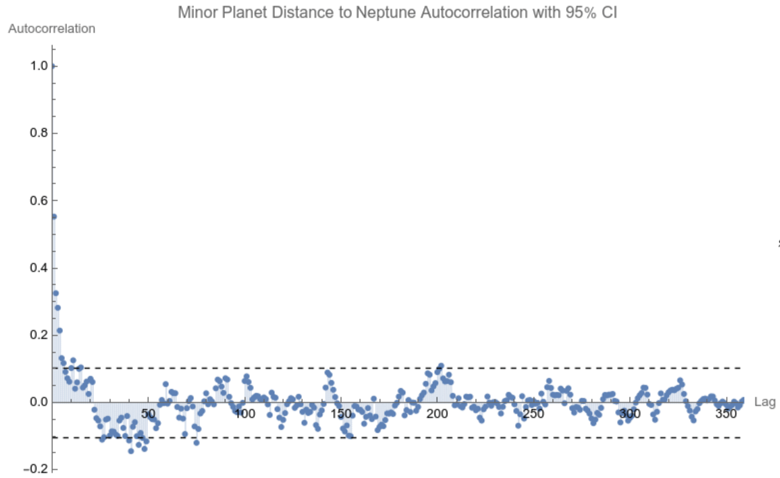

Minor Planet Distance to Mars Autocorrelation with 95% CI
Autocorrelation
Lag


Minor Planet Distance to Jupiter Autocorrelation with 95% CI
Autocorrelation
Lag

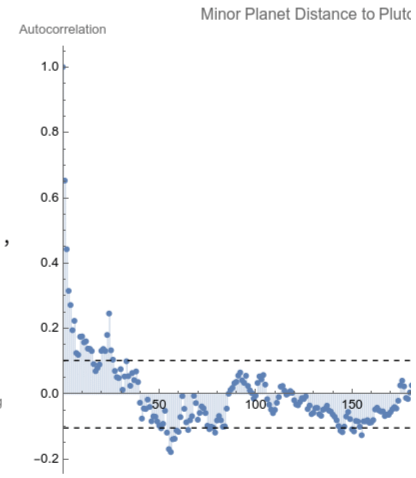

Minor Planet Distance to Satur
Autocorrelation



,



,




```
(*Table[Export["ACF"<>CommonName[specialpointsentities[[i]]]<>".png",acftable[[i]]],{i,11}]*)

tl = Table[Cases[CorrelationFunction[datatable[[i]], {0, 359}], x_ /; Abs[x] > 0.103299], {i, 11}];

Length[tl]

11

pos = Table[Position[CorrelationFunction[datatable[[i]], {0, 359}], tl[[i, j]]][[1, 1]], {i, 11}, {j, 1, Length[tl[[i]]]}]
```

```
{{1, 2, 3, 4, 5, 16, 19, 40, 41, 44, 45, 47, 56, 57, 59, 93, 216, 259},
 {1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19, 20, 21, 22, 23, 24, 25, 26, 27, 28, 29, 30, 31, 32, 33, 34, 35, 36, 37, 38, 39, 40,
  41, 43, 44, 45, 46, 47, 48, 49, 50, 51, 52, 53, 54, 55, 56, 62, 63, 64, 65, 66, 67, 71, 72, 79, 109, 110, 118, 120, 121, 124, 128, 129, 130, 133, 136, 137,
  138, 139, 140, 143, 144, 145, 146, 147, 152, 154, 155, 156, 157, 158, 159, 160, 161, 162, 163, 164, 165, 166, 167, 168, 169, 170, 171, 172,
  173, 174, 175, 176, 177, 178, 179, 180, 181, 182, 183, 184, 185, 186, 189, 190, 191, 192, 194, 195, 196, 200, 204, 205, 206, 207, 208},
 {1, 2, 3, 7, 11, 12, 13, 14, 17, 18, 19, 24, 25, 31, 82, 85, 96, 108, 132, 176, 177, 219, 223, 224, 225, 235, 236, 237, 247},
 {1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19, 20, 21, 28, 29, 30, 31, 32, 33, 35, 36, 37, 41, 42, 43, 44, 47, 48, 59, 62,
  63, 74, 75, 76, 77, 78, 89, 90, 114, 115, 156, 157, 158, 159, 166, 167, 168, 169, 182, 183, 184, 185, 186, 191, 192, 193, 194, 195, 204, 216, 217},
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  142, 143, 144, 145, 146, 147, 148, 149, 150, 151, 152, 153, 154, 155, 156, 157, 158, 159, 160, 161, 162, 163, 164, 165, 166, 167, 168, 169, 170, 171, 172, 173, 174, 175,
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  50, 51, 52, 54, 56, 57, 58, 59, 60, 61, 64, 65, 123, 124, 125, 126, 134, 144, 154, 155, 156, 165, 166, 167, 168, 203, 204, 205, 206, 207, 213, 214},
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```

```
posgroups = Table[Split[pos[[i]], #2 - #1 == 1 &], {i, 11}]
```

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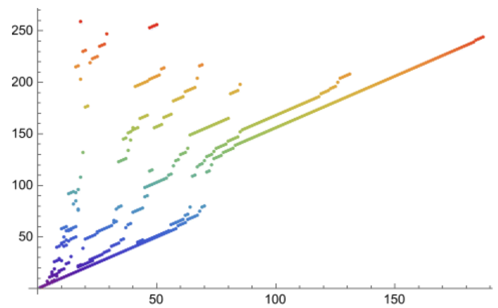
```

```
ListPlot[pos, ColorFunction → "Rainbow"]
```

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TableForm[Transpose[{CommonName[specialpointsentities], Transpose[{pos}]}]]
```

Mesarthim	1 2 3 4 5 16 19 40 41 44 45 47 56 57 59 93 216 259
Sun	1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 32 33 34 35 36 37 38 39 40 41 43 44 45 46 47 48 49 50 51 52 53 54 55 56 62 63 64 65 66 67 71 72 79 109 110 118 120 121 124 128 129 130 133 136 137 138 139 140 143 1
Moon	1 2 3 7 11 12 13 14 17 18 19 24 25 31 82 85 96 108 132 176 177 219 223 224 225 235 236 237 247
Mercury	1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 28 29 30 31 32 33 35 36 37 41 42 43 44 47 48 59 62 63 74 75 76 77 78 89 90 114 115 156 157 158 159 166 167 168 169 182 183 184 185 186 191 192 193 194 195 204 216 217
Venus	1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 32 33 34 35 36 37 38 39 40 41 42 43 44 45 46 47 48 49 50 51 52 53 54 55 56 57 58 61 62 63 64 67 68 69 70 71 75 79 80 113 114 120 126 127 128 129 132 133 134 135 136
Mars	1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 32 33 34 35 36 37 38 39 40 41 45 46 47 98 99 100 101 102 103 104 105 106 107 110 111 119 124 125 130 131 132 136 149 150 151 152 153 154 155 156 157 158 159 160 16
Jupiter	1 2 3 4 5 7 8 27 29 43 50 56 57 58 59 60 77 203 230 231
Saturn	1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 22 23 39 48 49 50 51 52 54 56 57 58 59 60 61 64 65 123 124 125 126 134 144 154 155 156 165 166 167 168 203 204 205 206 207 213 214
Uranus	1 2 3 4 5 14 26 27 28 58 59 60 92 93 94 215
Neptune	1 2 3 4 5 6 7 12 16 27 41 42 46 48 49 50 76 203
Pluto	1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 21 22 23 24 25 26 27 52 55 56 57 58 59 60 61 66 77 79 80 145 146 151 152 156 196 197 198 199 200 201 253 254 255 256

```
TableForm[Transpose[{CommonName[specialpointsentities], posgroups}]]
```

Mesarthim	1 2 3 4 5
	16
	19
	40 41
	44 45
	47
	56 57
	59
	93
	216
	259
Sun	1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 32 33 34 35 36 37 38 39 40 41
	43 44 45 46 47 48 49 50 51 52 53 54 55 56
	62 63 64 65 66 67
	71 72
	79
	109 110
	118
	120 121

124
128 129 130
133
136 137 138 139 140
143 144 145 146 147
152
154 155 156 157 158 159 160 161 162 163 164 165 166 167 168 169 170 171 172 173 174 175 176 177 178 179 180 181 182 183 184 185 186
189 190 191 192
194 195 196
200
204 205 206 207 208

Moon 1 2 3
7
11 12 13 14
17 18 19
24 25
31
82
85
96
108
132
176 177
219
223 224 225
235 236 237
247

Mercury 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21
28 29 30 31 32 33
35 36 37
41 42 43 44
47 48
59
62 63
74 75 76 77 78
89 90
114 115
156 157 158 159
166 167 168 169
182 183 184 185 186
191 192 193 194 195
204
216 217

Venus 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 32 33 34 35 36 37 38 39 40 41 42 43 44 45 46 47 48 49 50 51 52 53 54 55 56 57 58
61 62 63 64
67 68 69 70 71
75
79 80
113 114
120
126 127 128 129
132 133 134 135 136
139 140 141 142 143 144 145 146 147 148 149 150 151 152 153 154 155 156 157 158 159 160 161 162 163 164 165 166 167 168 169 170 171 172 173 174 175 176 177 178 179 180 181 182 183 184 185 186 187 188 189 190 191 192 193 194 195 196 197 198

	241 242 243 244
Mars	1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 32 33 34 35 36 37 38 39 40 41
	45 46 47
	98 99 100 101 102 103 104 105 106 107
	110 111
	119
	124 125
	130 131 132
	136
	149 150 151 152 153 154 155 156 157 158 159 160 161 162 163 164 165
	189 190 191 192
	198
Jupiter	1 2 3 4 5
	7 8
	27
	29
	43
	50
	56 57 58 59 60
	77
	203
	230 231
Saturn	1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16
	22 23
	39
	48 49 50 51 52
	54
	56 57 58 59 60 61
	64 65
	123 124 125 126
	134
	144
	154 155 156
	165 166 167 168
	203 204 205 206 207
	213 214
Uranus	1 2 3 4 5
	14
	26 27 28
	58 59 60
	92 93 94
	215
Neptune	1 2 3 4 5 6 7
	12
	16
	27
	41 42
	46
	48 49 50
	76
	203
Pluto	1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16

21 22 23 24 25 26 27
52
55 56 57 58 59 60 61
66
77
79 80
145 146
151 152
156
196 197 198 199 200 201
253 254 255 256

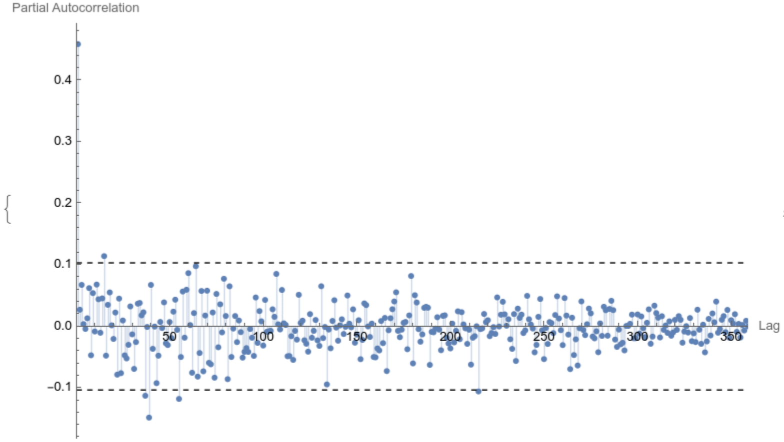
For completion's sake, create a PACF (partial autocorrelation function) plot with white-noise confidence bands to see the complete list of periodicities that do not rely on others to boost them that are beyond white noise with 95% confidence.

```
pacf[data_, lmax_, clev_ : 1 - 0.05, x_] :=
 Show[ListPlot[PartialCorrelationFunction[data, {lmax}], Filling → Axis, PlotRange → {{0, lmax}, All}, PlotStyle → PointSize[Medium], ImageSize → Medium,
   PlotLabel → "Minor Planet Distance to " <> CommonName[specialpointsentities[[x]]] <> " Partial Autocorrelation with Abs 95% CI >" <>
     ToString[Max[Quantile[NormalDistribution[], {(1-clev)/2, 1 - (1-clev)/2}] / Sqrt[data["PathLength"]]]]], Graphics[{Dashed, Line[{{0, #}, {lmax, #}}]}] & /@ Quantile[NormalDistribution[], {(1-clev)/2, 1 - (1-clev)/2}] / Sqrt[data["PathLength"]],
  ImageSize → Large, AxesLabel → {"Lag", "Partial Autocorrelation"}]

Table[pacf[TimeSeries[datatable[[j]]], 359, 1 - 0.05, j], {j, Length[specialpointsentities]}]
```

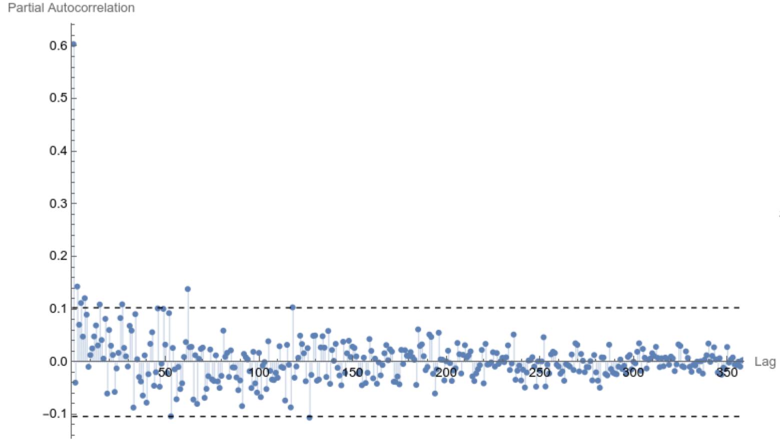
{

Minor Planet Distance to Mesarthim Partial Autocorrelation with Abs 95% CI >0.103299



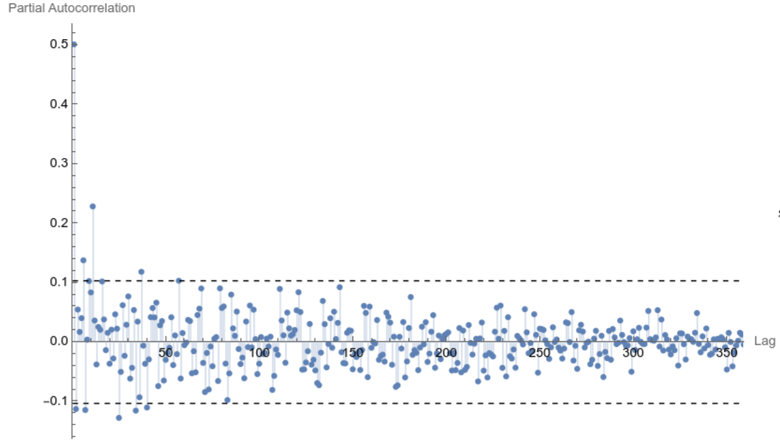
,

Minor Planet Distance to Sun Partial Autocorrelation with Abs 95% CI >0.103299



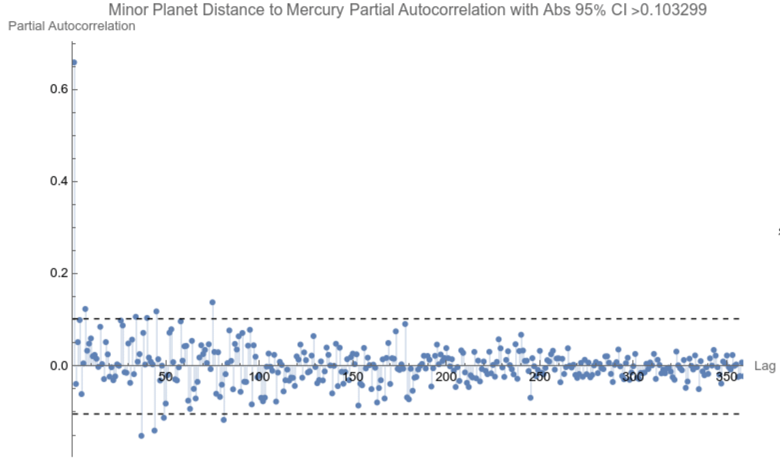
,

Minor Planet Distance to Moon Partial Autocorrelation with Abs 95% CI >0.103299



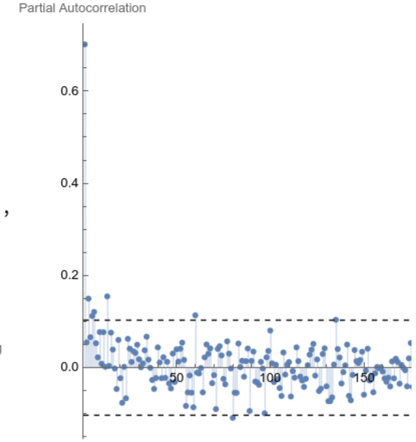
,

Minor Planet Distance to Mercury Partial Autocorrelation with Abs 95% CI >0.103299

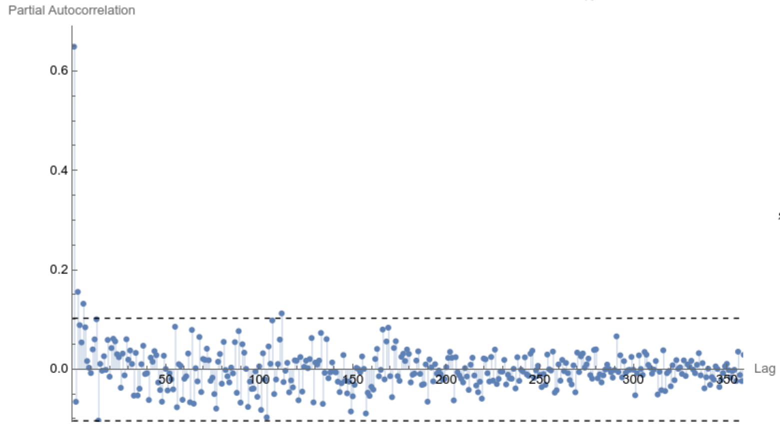


,

Minor Planet Distance to Venus Partial A

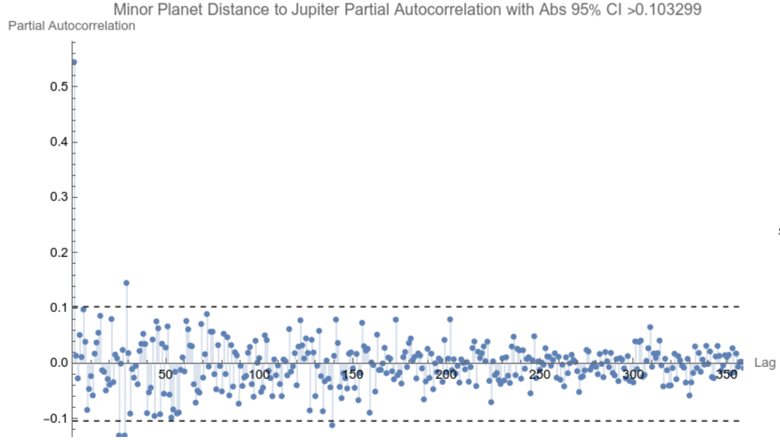


Minor Planet Distance to Mars Partial Autocorrelation with Abs 95% CI >0.103299



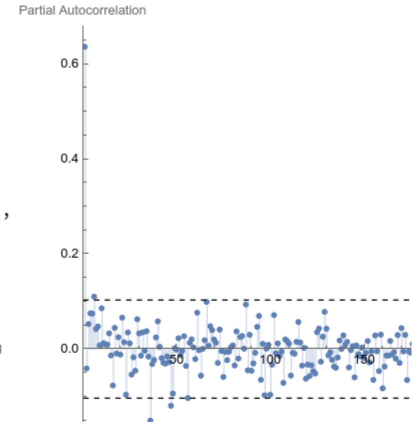
,

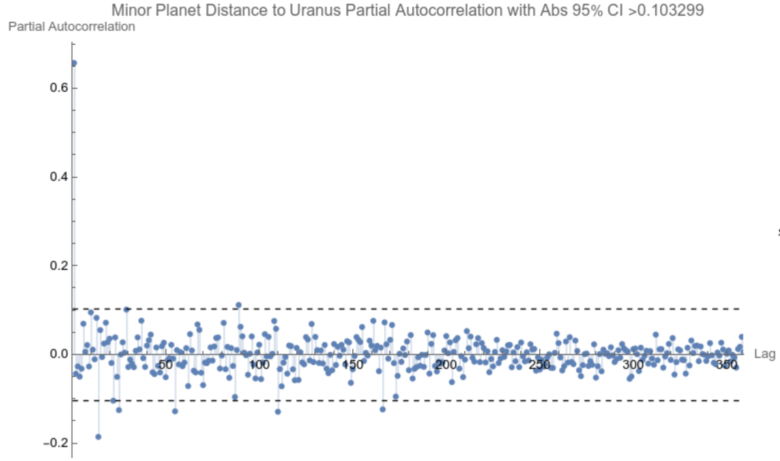
Minor Planet Distance to Jupiter Partial Autocorrelation with Abs 95% CI >0.103299



,

Minor Planet Distance to Saturn Partial A





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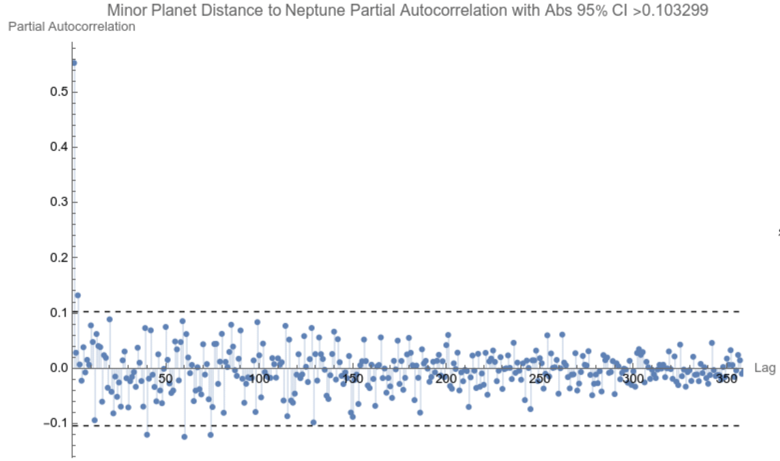
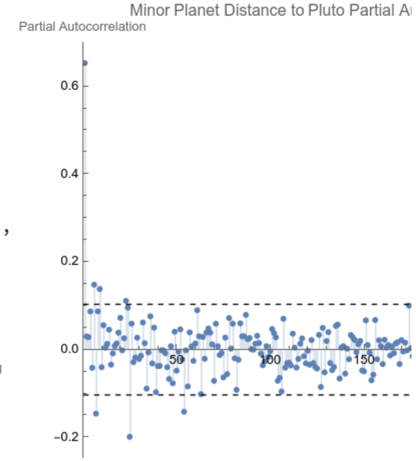


,




```
tl = Table[Cases[PartialCorrelationFunction[datatable[[i]], {359}], x_ /; Abs[x] > 0.103299], {i, 11}];

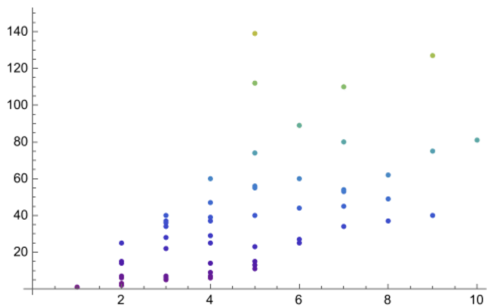
Length[tl]

11

pos = Table[Position[PartialCorrelationFunction[datatable[[i]], {359}], tl[[i, j]]][[1, 1]], {i, 11}, {j, 1, Length[tl[[i]]]}]

{{1, 15, 37, 39, 55, 215}, {1, 3, 5, 7, 15, 27, 53, 62, 127}, {1, 2, 6, 7, 11, 25, 34, 37, 40}, {1, 7, 34, 37, 40, 44, 45, 49, 75, 81}, {1, 3, 5, 6, 13, 60, 80},
 {1, 3, 6, 14, 112}, {1, 25, 28, 29, 139}, {1, 6, 36, 47, 56}, {1, 14, 22, 25, 55, 89, 110, 166}, {1, 3, 40, 60, 74}, {1, 6, 7, 9, 23, 25, 54}}

ListPlot[pos, ColorFunction → "Rainbow"]
```



```
TableForm[Transpose[{CommonName[specialpointsentities], Transpose[{pos}]}]] (*Significant lags*)
```

Mesarthim	1 15 37 39 55 215
Sun	1 3 5 7 15 27 53 62 127

Moon	1 2 6 7 11 25 34 37 40
Mercury	1 7 34 37 40 44 45 49 75 81
Venus	1 3 5 6 13 60 80
Mars	1 3 6 14 112
Jupiter	1 25 28 29 139
Saturn	1 6 36 47 56
Uranus	1 14 22 25 55 89 110 166
Neptune	1 3 40 60 74
Pluto	1 6 7 9 23 25 54

```
Divisors[72]
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```
{1, 2, 3, 4, 6, 8, 9, 12, 18, 24, 36, 72}
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