

The planet Venus at Luxor in an ancient solar system model

Abstract

In the previous paper in this series an 1:87500 model of the Moon, Earth and Sun was established which starts in the Libyan desert, passes through the Great Pyramid of Giza's base center point and terminates at the model of the Sun on an island in the Black Sea. Other than the Earth, which was modeled over Cairo, none of the locations of the models of the other planets of the inner solar system were established. In this paper I identify two models of Venus which are attached to the Earth model of the system both of which are marked out explicitly by ancient Egyptian temples. I show that the long term average range of Venus relative to the range of Earth at the 2729 BCE winter solstice is marked out by the temple at Dendera and that the instantaneous periapsis range of Venus at the winter solstice is marked out on the Avenue of the Sphinxes at the temple of Luxor. The planet model in Luxor is shown to have a highly accurate scaled distance from the model of the Earth in Cairo which, when scaled back up to full size, is within 105 km of the range value given in NASA's ephemeris tables which relates to an timing error in the ephemeris table of 17 minutes at the moment of the winter solstice in 2729 BCE. I further show that the orbital inclination of Venus and its axial tilt to its orbit have also been modeled and thereby solve the alignment and positioning of the temple of Hatshepsut located on the opposite side of the Nile. I conclude that the Luxor temple complexes are part of the solar system model established in the previous paper and represent a model of Venus at the moment of the 2729 BCE winter solstice of Earth.

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The Great Pyramid papers

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The planet Venus at Luxor in an ancient solar system model

The starting place for determining the location of the model of Venus associated with the Earth and Sun models from the previous paper is the DE441 ephemeris data published by NASA which allows for a highly accurate range value of the planet at the date of the winter solstice 2729 BCE to be used within the modeling of the inner solar system. It is also known from the work in the previous paper in this series that the scale of the model of the solar system is 1:87500 and that a rotation system is being used in which an initial bearing in an easterly direction is used as a reference azimuth and lines are then rotated by 1 radian for every 365 perfect kilometers (pkm) of line length.

Using this data as a starting point, and working from the center points of the models of the Earth and the Sun that were established in the previous paper¹, an investigation was undertaken to determine the location of the Venus model. A variety of possible systems were looked at including mapping the scaled down range value from the Sun center point, mapping the range of Venus relative to the Earth center point by deducting Venus's range at the solstice from the Earth's range at the solstice, and a system in which the long term average aphelion and perihelion values were used for the range of Venus rather than the date specific value. Once the system that had been used within the architecture became apparent then a final set of adjustments were made to the starting points of the system, which is at the Earth model in Cairo, so that the geometric geodesic lines perfectly conformed to the architectural features, the GPS locations of which were extracted from the Google Earth application.

The investigation revealed that there are two models of Venus, both of which are designed by using the range of the planet relative to the range of the Earth at the winter solstice, a design system which ensures that you cannot solve the location of the Venus models before you have solved the locations of the Moon, Earth and Sun systems, which were completed in the previous paper.

This paper comprises of three sections. The first deals with the starting locations of the geodetic plots on the Earth model that was established in the previous paper over Cairo, the second deals with the location of the first of the Venus models which is based on the long term average perihelion value of Venus relative to the periapsis range of Earth at the winter solstice of 2729 BCE, and the third section of the paper deals with the second and principal model of Venus, the location of which is designed using the precise range of Venus at the winter solstice relative to the precise range of the Earth at the same moment in time.

The starting points on the Earth model

The location of the starting points of the geometric design on the Earth model was determined by identifying close fits for the Venus models and then by making adjustments to the starting locations on the Earth model until the architectural reference points matched the geometry, and the start points are therefore an artifact of a feedback loop and cannot be identified until the Venus system is complete. There are constraining factors as to where the start points must lie, because they must be principal points on the Earth model rather than more obscure secondary geometry points such as focal points or alike, and the radius of the model of the Earth is likely to be an integer perfect kilometer value so that it conforms to the model of the Moon that has previously been solved. These constraints were used when feeding back the Venus model solutions into the possible start locations and the final solution to the Earth based start points is shown in diagram P0.

The point labeled GEO0001 is positioned on the equator of the Earth model at a distance of exactly 18 pkm from the center point, the line being drawn between the two points using geodetic mapping and the azimuth of the line being 274.8397433499615 degrees, that being the axial tilt of the Moon of 4.573129

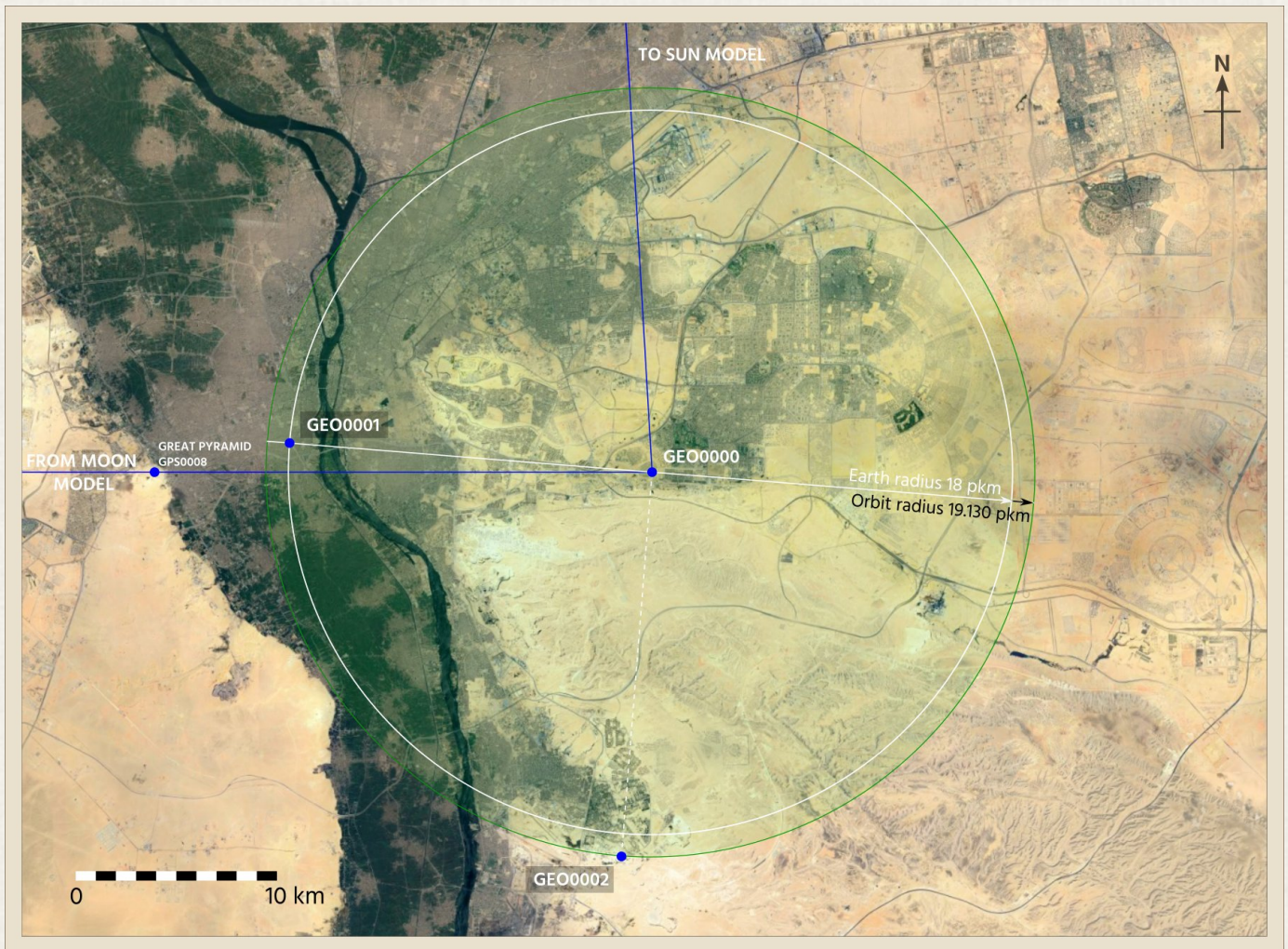


Diagram P0 - The reference starting points on the Earth model over Cairo.

degrees that was established during the analysis in an earlier paper² when rotated from the reverse azimuth of the inbound line from the Moon model. The point labeled GEO0002 is the south pole of the Earth marked onto the 333.333:1 scale model of the Earth with a polar radius of 19.0665 pkm and the azimuth of the line connecting the Earth center point to this point is 90 degrees less than that of the equator point line.

The reference points on the diagram have the following GPS coordinates in 2729 BCE on the fully resolved inner solar system model:

	Latitude (deg)	Longitude (deg)
GEO0000	29.97785626039266	31.387668528373258
GEO0001	29.991427457676348	31.201758011400813
GEO0002	29.8064329639019	31.37102544015792

The long term average Venus model

The long term average model of Venus uses the point GEO0001 as its start point and the line length of the plot between this point and the Venus model is calculated by taking the modern value of the long term perihelion distance of Venus of 107480000 km and deducting this from the periapsis distance of the Earth given in the DE441 ephemeris of 146872316.4 km at the winter solstice 2729 BCE to give the difference between the two in perfect kilometers as 39383700.95 pkm which scales down to 450.099439 pkm at a scale of 1:87500. This distance is then divided by 365 to give the angular rotation of the line as 1.233149 radians, equal to 70.6542418 degrees, which can then be added to the azimuth of the reference line at the Earth center point of 90.26658 to give the azimuth of the line to the Venus model as 160.920822 degrees. It is then a straight forward task to plot this line geodetically and diagram P1 shows the resulting location of the end point of the line.



Diagram P1 - The temple at the long term average perihelion point of Venus.

The left side of diagram P1 shows a high altitude view of northern Egypt with the Earth model at the top of the illustration over Cairo, the town of Luxor at the south of the image and the temple of Dendera located at the end of the purple connecting line. In the right of the diagram the resulting point is shown, labeled as VEN0000, and which lies just to the north east of the temple of Dendera at the modern GPS coordinates $26.14431378^{\circ}\text{N } 32.6727568^{\circ}\text{E}$ after tectonic plate movement has been applied to the fully calibrated system. The cross section model of Venus that is shown on the diagram is scaled at 1:87500 giving a radius of 69.1498 meters and the planet model is rotated by the angle marked as r° on the diagram, which is 360° minus the reverse azimuth of the inbound line from the Earth model.

The distance of this model of Venus from the center of the temple of Dendera, that being defined as the location on the temple's primary axis that is equidistant from the temple's four perimeter walls, is 365 perfect meters and the azimuth of the line between the model of Venus and the temple center is exactly 225° . Quite clearly the model of Venus is in the correct location and the geometric model needs to be connected to the center of the temple.

Diagram P2 shows the connection from the model to the temple and a second model of Venus can then be drawn around the temple center point which is twice the size of the first model and which defines the perimeter walls of the temple. If you refer back to the formation of the Sun model in the previous paper³ you will see that connection of the two models at Dendera and the connection of the two models on Snake Island are done in a very similar manner, further confirming that the system is being correctly analysed.

Additionally, the temple of Dendera is best known for the fact that the Dendera Zodiac⁴ was discovered within the temple. It is the earliest known depiction of the night sky in the format of the zodiac, a zodiac being by definition the 12 areas of the night sky derived from the motion of the Moon around the Earth. 4



Diagram P2 - The second model of Venus lying above the temple of Dendera.

The final part of the geometric construction is to define the entrance pathway to the temple and this can be seen by analysis to be the mirror image of the inbound line from the Earth model in Cairo. The angle is marked on diagrams P1 and P2 as r° as a bearing west of north and the entrance pathway is therefore built at an azimuth of r° with its length being 365 perfect meters. This construction is shown in diagram P3.



Diagram P3 - The third model of Venus at the temple of Dendera.

The geometric and geodetic construction of this temple and its conformity to the principals already seen in the previous papers is perfect in every detail and the question as to whether the Dendera temple is a model of Venus on the 1:87500 model of the inner solar system is answered unequivocally.

The Dendera Zodiac

It would be remarkable indeed if the Dendera Zodiac was not a model of the night sky at the moment of the 2729 BCE winter solstice, and although a detailed analysis of the Zodiac would require extensive research it is possible to affirm that it was designed and built by the same architects as the Great Pyramid and the inner solar system model and therefore significantly pre-dates the current estimated date of its construction.

The Dendera Zodiac was removed from the ceiling of a room on the temple's roof by explorers and now resides in the Louvre museum in Paris. Diagram P4 shows a image of the Zodiac roof sculpture which is taken from the Louvre museum's webpage⁴ where its dimensions are given as being 255cm by 253 cm.



Diagram P4 - The original Dendera Zodiac held in the Louvre museum.

If the zodiac is technically correct from an astronomical point of view then the primary reference point that one would expect to find on this low relief sculpture would be any of the solstice or equinox points.

In the Great Pyramid of Giza's lower northern shaft, when it was first opened up by explorers, there were two artifacts that were found in the shaft, one of which was a metal hook. Because the lower northern shaft is now known to be the mechanism by which the axial tilt of the Earth can be calculated⁵ to very high precision, and that when that calculation is performed it gives the corresponding date as being the winter solstice in the year 2729 BCE, then the artifact that was hidden inside the shaft is a symbol representing the winter solstice.

If the four outer sections of deities on the Dendera Zodiac are extracted from the sculpture and placed side by side, and then a scaled image of the hook is superimposed upon these cut out sections it can be seen that the asymmetric hook shape exactly matches the knee section of the sculptures as shown in diagram P5.



Diagram P5 - The hook from the lower northern shaft of the Great Pyramid on the Dendera Zodiac.

The upper series of images are labeled according to their location on diagram P4 and show the extracted section of the image rotated so that the figures in the image are upright. The lower series of images shows each of the upper series with the hook from the Great Pyramid superimposed upon the knees of the deities that are holding the stars and heavens aloft. The asymmetric hook shape *perfectly* aligns with the profile of the knees in each of the sculptured images, showing without doubt that the same architects are responsible for the the hook and for the zodiac sculpture.

In the first image of the lower series the hook perfectly completes the missing damaged section of the sculpture, in the second image the two ends of the hook align with the clothing on the deities, in the third image the ends of the hook do not align with the clothing, and in the fourth image only one side of the hook aligns with the clothing. Assuming that the damaged section in the first image is an original part of the sculpture, and therefore is not actually damaged, then image one shows that the hook needs to be inserted into the missing gap in order to complete the sculpture.

The pair of deities on the left side of diagram P4 must therefore be a representation of the winter solstice in 2729 BCE and from that information, combined with the ephemeris data that is available in DE441 it is possible to resolve the primary layout of the zodiac as shown in diagram P6.



Diagram P6 - The Dendera Zodiac with the winter solstice 2729 BCE alignments.

The hook is inserted into the missing stonework on the left of the image and the pair of deities in the bottom of the image serve as the alignment point for the longitude of the ascending node of the Moon's orbit. Remembering that the zodiac is a view of the stars when looked at from below, and therefore conventional astronomical angle directions need to be reversed when applied, the argument of periapsis of the Moon from DE441 at the time of the winter solstice in 2729 BCE can first be applied from the ascending node and is shown by the orange arc and line. This line by definition marks out the location of the point in the Moon's orbit where perigee occurred and so the line between perigee and apogee can be drawn onto the sculpture by extending the orange line across to the other side of the inner circle.

Because the inner white circle represents an orbit of the Moon the center of this orbit and the two focal points can be added to the perigee-apogee line. From the focal point marked as F_1 on the diagram, which is the location of Earth or to be technically correct the location of the Earth-Moon barycenter, the true anomaly of the Moon can then be added as a rotation shown in yellow and the position of the Moon at the winter solstice marked on the drawing at a point which is perfectly in line with the hook from the Great Pyramid which marks out the winter solstice point.

The apogee and perigee markers are shown in diagram P7 in more detail.



Diagram P7 - The perigee and apogee markers of the Dendera Zodiac.

Both of the marker points contain one larger and one smaller semicircle which represent the Moon when it is at its nearest distance and at its farthest distance from the Earth, the larger being annotated, on the diagram only, by the plus sign and the smaller by the minus sign. On the perigee marker the larger of the semicircles is duplicated onto the stem of the sculpted figure showing that at this point the Moon was at its closest point to the Earth. On the apogee marker the two semicircles are smaller in size than on the perigee marker showing them as being further away.

This initial analysis of the Dendera Zodiac shows that it conforms to the astronomy that has been seen in all the previous work up to this stage. The detail in the sculpture will be highly accurate and the starting point for an analysis of the star depictions in the central circle needs to be a digital scan of the sculpture, or a photograph which has had the lens distortion digitally corrected by means of measured reference points being placed upon the sculpture's surface to form a grid system to which the image can be aligned.

The principal model of Venus

Returning to diagram P0 the starting point for locating the main model of Venus that is formed from the range of the planet at the winter solstice in comparison to the known range of Earth at the same moment in time is the point GEO0002 located on the south pole of the 19.066 pkm polar radius ellipse.

The distance of the Venus model from this point can first be calculated using the DE441 range data for Venus at the winter solstice of 2729 BCE to give an initial very close estimate of the line's length and hence the angular rotation required from the reference line at the center of the Earth model. The geometry can then be refined and detached from DE441 by adding or subtracting distance from the connecting line until it matches the architectural model that marks out Venus. When this calibration is performed the model of Venus can be shown to be located at the temple of Luxor 471.714197 pkm from the reference point in Cairo and at an azimuth of 164.3138271 degrees, the adjustment from the DE441 value being 150 km which equates to a time difference of 17 minutes when computed using the range rate listed in DE441 for Venus at this moment in time. Diagram P8 shows the alignment to the Luxor temple construction where the model of Venus ends up on the Avenue of the Sphinxes at a seemingly random location. The inset image shows a close up of the start of the avenue with the inbound line from Venus aligned with the 37th sphinx counting from the southern end.

The reference points on the diagram have the following modern tectonic plate adjusted coordinates on the GPS system for the fully calibrated inner solar system model:

	Latitude (deg)	Longitude (deg)
GEO0002	29.80704897029775	31.37177014996413
VEN0003	25.701958293454943	32.641603239213595



Diagram P8 - The center point of the model of Venus at the Luxor temple.

The location of the Venus model center point is one tenth of the way along the avenue, there being 372 sphinx statues from end to end on the avenue. This alignment mechanism is identical to that which was used to determine the location of the base center point of the Great Pyramid of Giza in the previous paper⁶ and is designed to confirm that the method of locating both the points is correct.

The radius of the model of Venus can be worked out by aligning it first to the eastern entrance of the Karnak Temple and then to the temple of Hatshepsut on the western bank of the Nile, these two temples being the two other large temples that are located in Luxor area. Diagram P9 shows the model of Venus drawn over a satellite image of the area with the radius of the model being 2560 perfect meters. The purple line on the diagram is the inbound line from the Earth model which terminates at the model center point VEN0003 and the point VEN0004 is the equator marker point on the planet's surface. The angular rotation of the equator is calculated by adding the DE441 value of the obliquity of the orbit of Venus relative to the Ecliptic to the reverse azimuth of the inbound line and then deducting the inclination of Venus to its orbit from this value.

Because the angle of the equator is essential when forming other parts of the solar system model, the architecture contains a method for validating that the construction method just used is correct. The point VEN0004 is directly in line with the central axis of the Hatshepsut temple and analysis of the system shows that if the mean anomaly and true anomaly of Venus at the winter solstice are averaged and drawn onto the diagram using the point VEN0004 as the reference point, a westerly direction as the reference for periapsis and rotating the line anticlockwise, then the axis of the temple is defined. This arrangement is shown in diagram P10. The reason for using the westerly line as the reference direction and rotating in the opposite direction from the previous convention seen in the system is that Venus is the only planet in the solar system where the rotation is retrograde, and therefore the geometry conventions are also reversed. 10

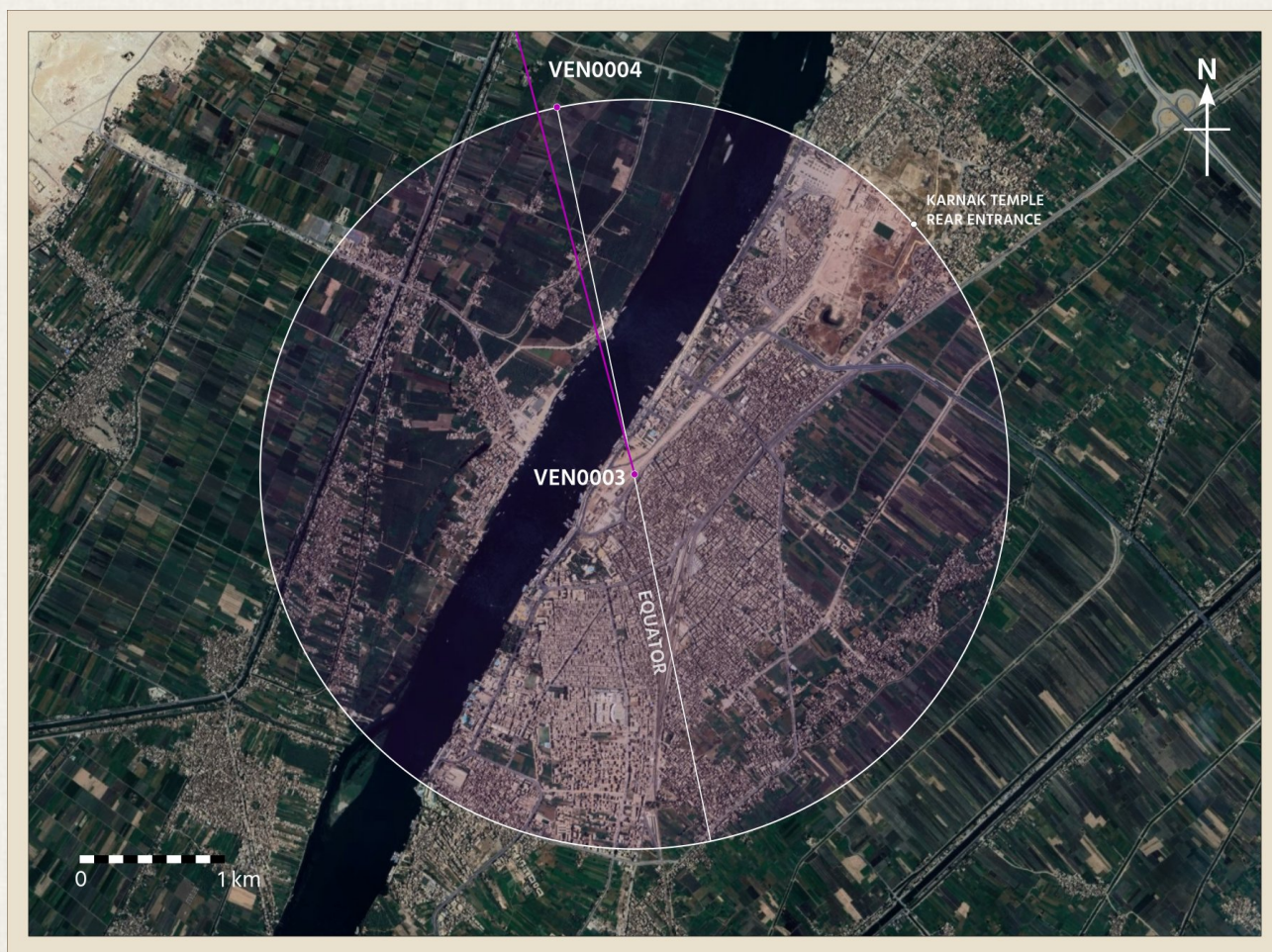


Diagram P9 - The principal 2560 pm diameter model of Venus at the Luxor temple.

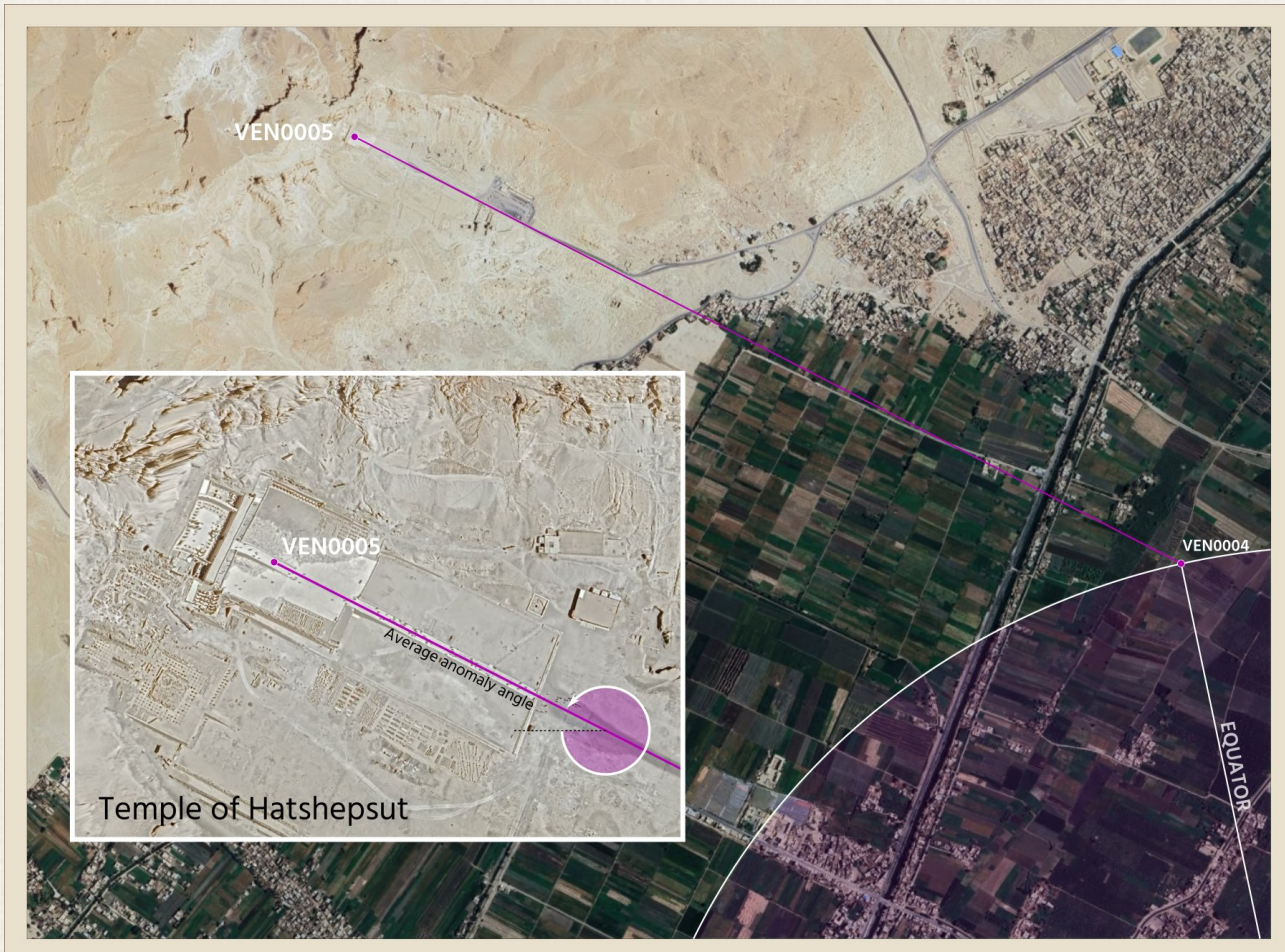


Diagram P10 - The alignment of the equator point with the temple of Hatshepsut.

The westerly reference direction is a reflection in the north-south axis of the Moon-Earth reference line in Cairo and therefore has an azimuth of 269.7334 degrees. The average anomaly line is drawn with a length of 3326.96 pm, ten times the average anomaly in degrees, and terminates half way along the upper ramp of the temple and is therefore at the average altitude of the temple's two courtyards.

Because the equator line's azimuth is the reference angle for the another vital alignment in a later part of the system and because the equator azimuth is derived from three angles, its angular construction is shown in diagram P11 in detail so as to provide a clear reference to its manner of construction that can be referred back to in a future paper.

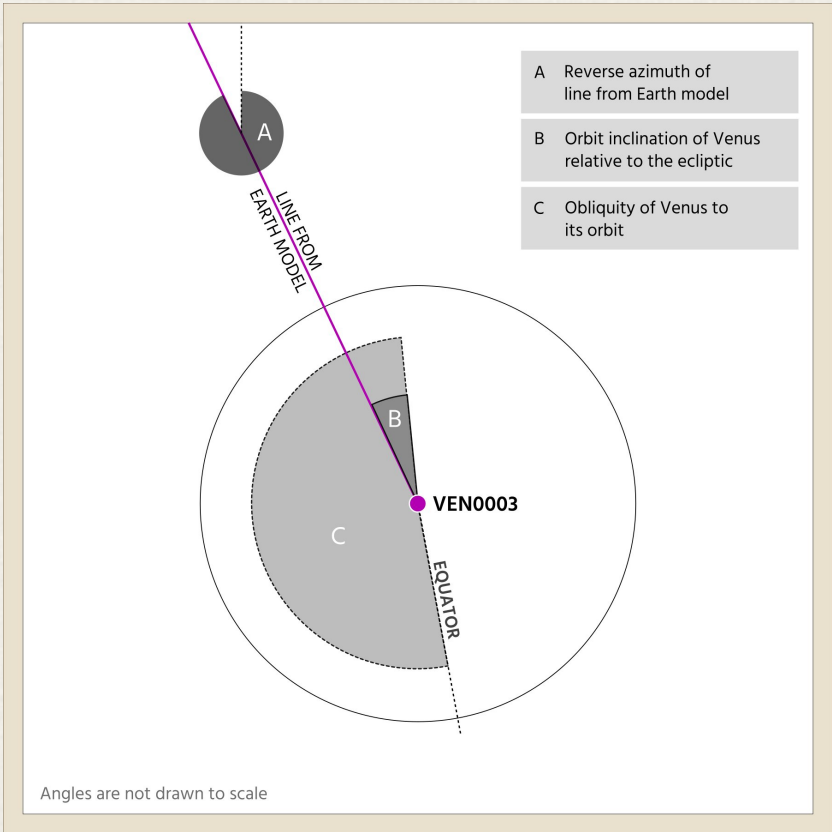


Diagram P11 - The manner of construction of the Venus model equator azimuth.

The angles in the construction of the equator line are

A.	Reverse azimuth of line from Earth	344.905569	degrees
B.	DE441 orbit inclination of Venus to Ecliptic	0.375232	degrees
C.	Obliquity of Venus to its orbit	<u>-177.319392</u>	degrees
	Resulting azimuth of equator line	167.961409	degrees

The value of the obliquity of Venus to its orbit used in this calculation is produced from the fully calibrated inner solar system model and assumes that the orbit inclination in the DE441 ephemeris is correct. The value of the addition of these two numbers, -176.94416, is the constant which should be used in the calibration, which is the obliquity of Venus to the Ecliptic.

Appendix

pm	Perfect meter. One 10 millionth of the distance from the North pole to the equator on the WGS84 reference ellipsoid of Earth. The conversion factor between meters and perfect meters is $1 \text{ pm} = 1.00019657308809 \text{ m}$
pkm	Perfect kilometer. 1000 perfect meters.

Tectonic plate movement

The geodetic calculations performed during the work for this paper were done on the Earth's WGS84 reference ellipsoid at the base date of Jan 14 2729 BCE with no tectonic plate movement applied to the points. On all diagrams in this paper all points on the geometric plots have had tectonic plate movement between the base date and the date February 26th 2018 applied to them using the mm/yr plate movements listed by the EarthScope Consortium on their interactive plate movement calculator (<https://www.unavco.org>) using the *terminating* point on each individual geodesic line as the reference coordinates for the plate movement that is applied to *both* end points of that line.

Supplementary material

The data points and associated geodetic mappings for the inner solar system model are contained within a Google Earth application kml file. Each point in the file contains the high precision coordinates of the point as it was calculated by the software and a description of how the point and line from the previous location has been formed, listing both the numerical logic and the astronomical reference to which the point is associated. The file is available to download at the following URL:

<https://www.thegreatpyramidpapers.com/documents/kml/InnerSolarSystem.kml>

That kml file was produced on a piece of bespoke software which was designed and developed to create complex geodetic paths across the WGS84 reference ellipsoid specifically to solve the puzzle outlined in this and previous papers in the series. It was deliberately written in javascript to integrate into a webpage interface so that the underlying code could be examined. The fully functioning interface is available at the following URL:

<https://www.giza-plateau.com/PathCreator.html>

The file type that this programme uses is also bespoke and called '.gpf' or a Giza Pyramid File. Saved files can be loaded into the software using the available selection box on the webpage and the inner solar system model is available in this list under the name 'Inner solar system'. The interface also includes the ability to load any of the previously saved individual locations listed on the inner solar system model into the starting point of a new path, allowing the user to create new path systems and investigate further into the subject.

The calculations for the solar system model's astronomy were performed in a spreadsheet which is provided as supplementary material for reference and cross checking purposes

https://www.thegreatpyramidpapers.com/documents/ods/Solar_system.ods

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