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15/04 Saturn in the Hinterland
The Giant of Suryavarman I

True ecliptic longitude from Sun on April 15 (Julian) 967 CE = -19.10 ° at true midnight ie at 23:58:12 local civil time (Meridian of Phnom Bok)
Observer : Phnom Bok (13.46708° N ; 103.98201° E)
Ecliptic longitude provided by the Khmer diagram = -19.00°

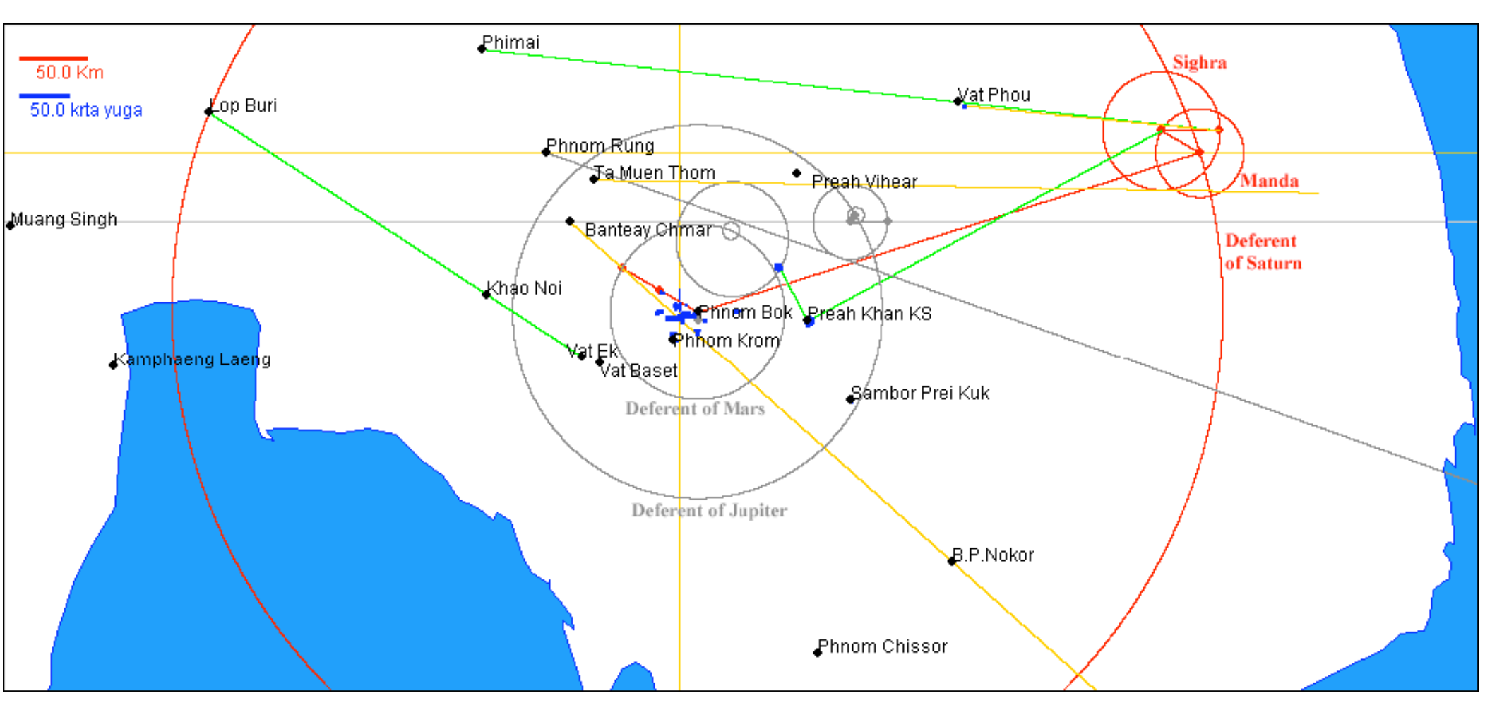
> *"Suryavarman was an energetic ruler, anxious to make a difference. He may have been responsible for the founding of **Preah Khan of Kompong Svay**, an important settlement about sixty miles (100 km) to the east; ...*
> *The king's territory came to incorporate all that had belonged to his predecessors, with the probable addition of the **Lopburi** area in present-day Thailand, on the middle reaches of the Chao Phraya River. Part of northeastern Thailand, around **Phimai**, had a significant Khmer population and was incorporated within the Angkorian territory; "*

"Angkor: history, religion and culture" by Ian Mabbett
From "Angkor : celestial temples of the Khmer empire"
Author : Jon Ortner
Publisher : Abbeville Press Publishers, 2002

Phimai : Naga « Bridge »

The first half of the eleventh century, during the long reign of Suryavarman I, saw indeed the empire become more vast, populous and prosperous.
The king established four *linga* to delimit his empire:
The first Linga was consecrated at **Vat Baset**, 70 km to the south-west of Angkor.
The three other Linga were established during 1018 CE at :
- **Preah Vihear**, on a promontory of the Dangrek Range, 140 km to the north-east of Angkor
- **Phnom Chissor**, a sacred hill located 270 km to the south-east.
- Isanatirthi, somewhere in the east.

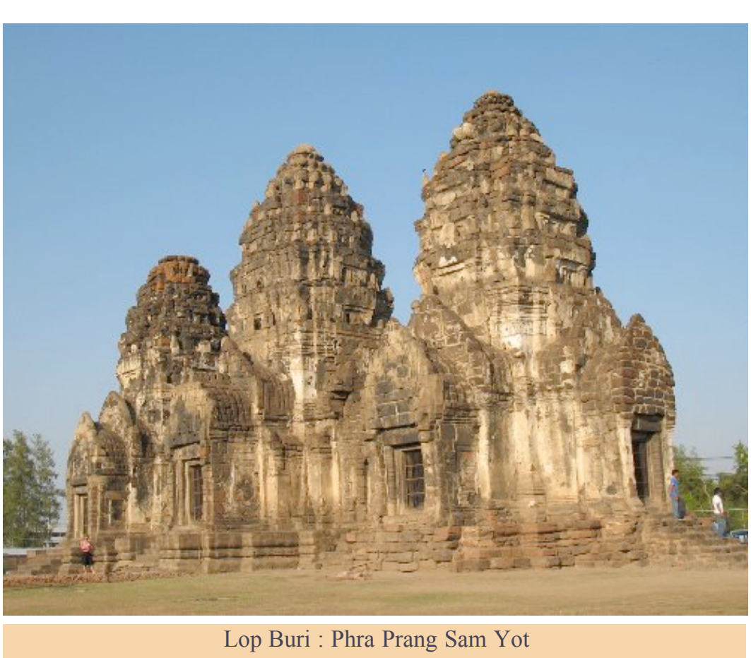
We have discovered that the location of most sites mentioned above were related to the planetary diagrams established by Suryavarman I. One of these is a giant diagram, obeying the rules of the "Midnight" system, which determines the azimuth (ie the ecliptic longitude) of 15/04/967 Saturn . This diagram seems to have been designed to include the whole territory controled by Suryavarman I.

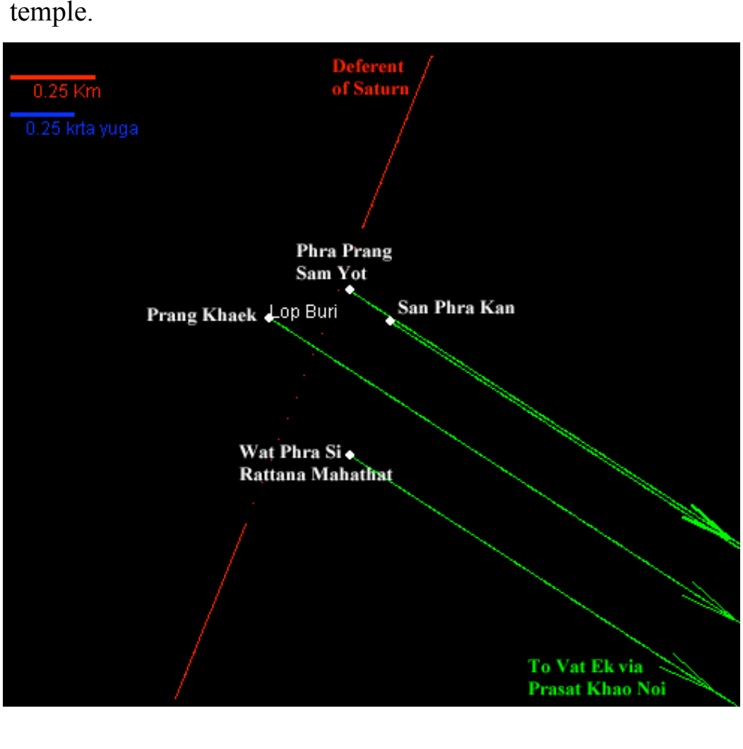

50.0 Km
50.0 krta yuga
Phimai
Lop Buri
Vat Phou
Sighra
Phnom Rung
Ta Muen Thom
Preah Vihear
Manda
Muang Singh
Banteay Chmar
Deferent of Saturn
Khao Noi
Phnom Bok
Preah Khan KS
Phnom Krom
Kamphaeng Laeng
Vat Ek
Vat Baset
Deferent of Mars
Sambor Prei Kuk
Deferent of Jupiter
B.P.Nokor
Phnom Chissor

Saturn can be located to within 0.1° of its correct azimuth (longitude) if :

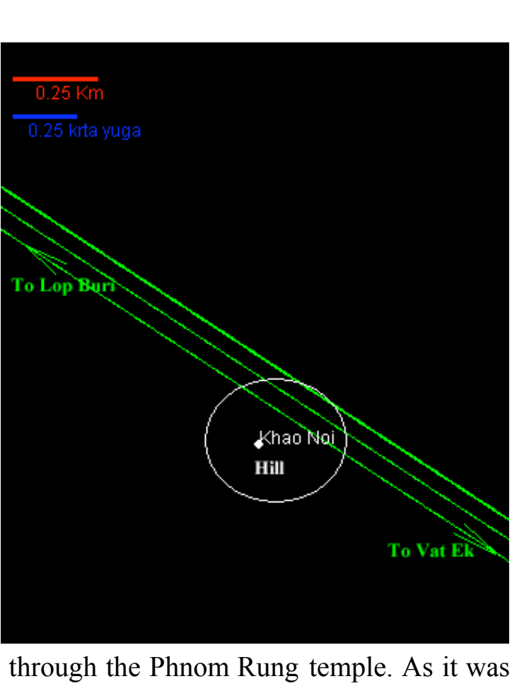
- we choose as observer the particular location determined previously on Phnom Bok .

- we locate Lop Buri on the deferent after putting the centre of the Manda epicycle on the parallel of the Phnom Rung temple.


Lop Buri : Phra Prang Sam Yot


0.25 Km
0.25 krta yuga
Deferent of Saturn
Phra Prang Sam Yot
Prang Khaek
Lop Buri
San Phra Kan
Wat Phra Si Rattana Mahathat
To Vat Ek via Prasat Khao Noi

We discovered that the loxodromes drawn from Vat Ek (another temple built by Suryavarman I in the Vat Baset area) to the four temples of Lop Buri run through the « phnom » (hill) where the Prasat Khao Noi was erected during the 7th century. We suggest the temples of Lop Buri were located on the intersection of the deferent with the latter loxodromes.


0.25 Km
0.25 krta yuga
To Lop Buri
Khao Noi
Hill
To Vat Ek

As noted earlier, the parallel of the Manda epicycle's centre runs through the Phnom Rung temple. As it was our starting point, we chose the parallel of the eastern doorway (P). The coordinates were determined by Asger Mollerup.

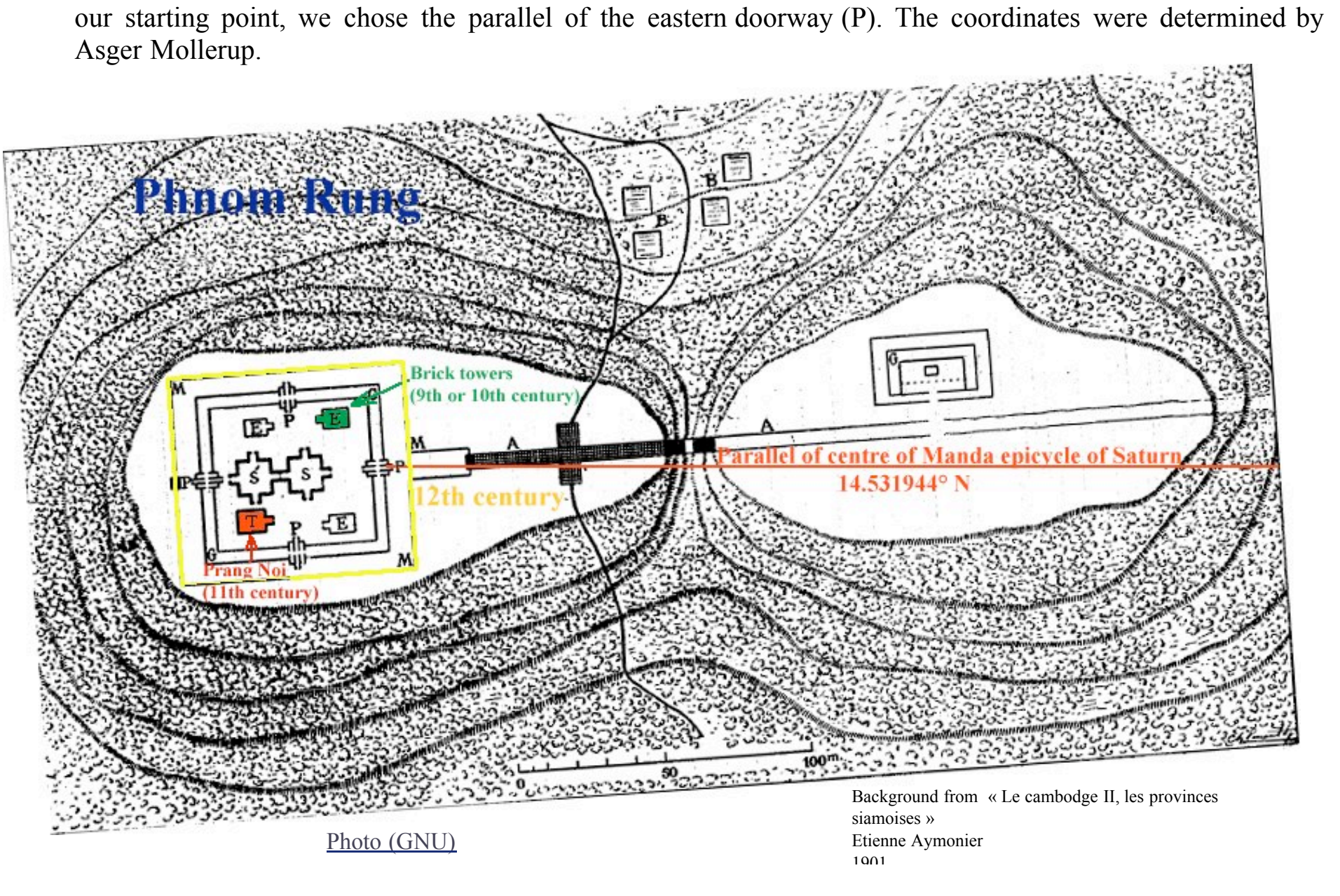
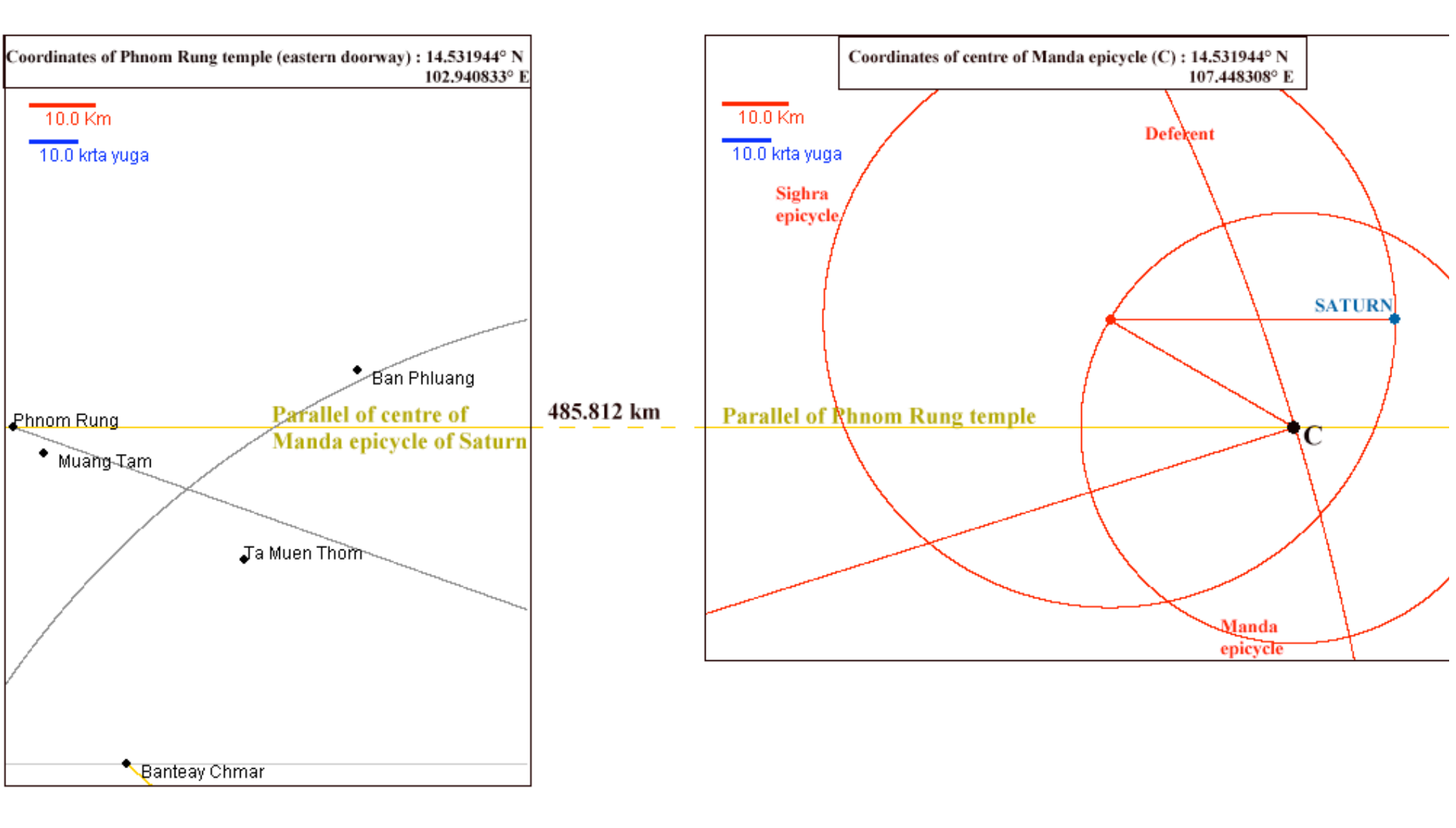
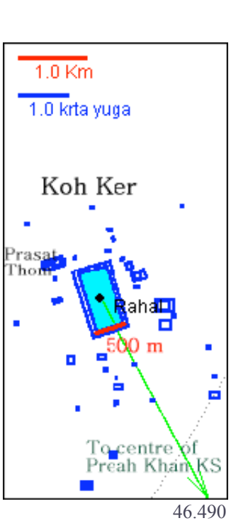

Phnom Rung
Brick towers (9th or 10th century)
12th century
Prang Noi (11th century)
Parallel of centre of Manda epicycle of Saturn
14.531944° N

Photo (GNU)

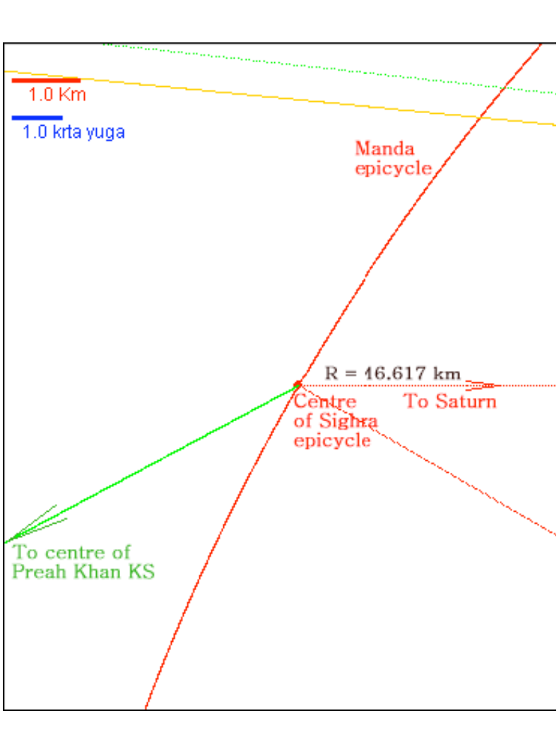
Background from « Le cambodge II, les provinces siamoises » Etienne Aymonier 1901

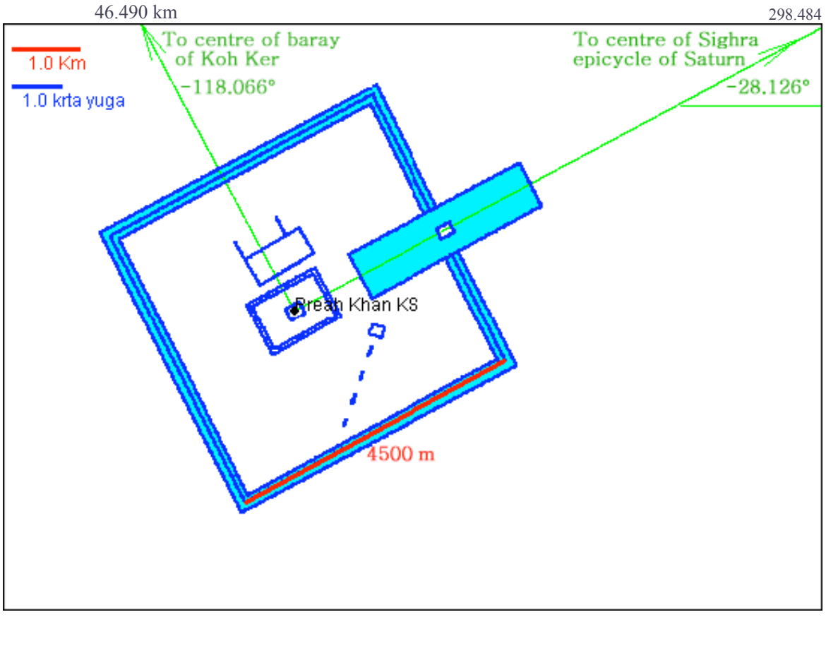
It is worth noting that the Prang Noi (red colour) was built during the 11th century, probably during the reign of Suryavarman I.


Coordinates of Phnom Rung temple (eastern doorway) : 14.531944° N 102.940833° E
10.0 Km
10.0 krta yuga
Ban Phluang
Phnom Rung
Parallel of centre of Manda epicycle of Saturn
Muang Tam
Ta Muen Thom
Banteay Chmar
485.812 km
Coordinates of centre of Manda epicycle (C) : 14.531944° N 107.448308° E
10.0 Km
10.0 krta yuga
Sighra epicycle
Deferent
SATURN
Parallel of Phnom Rung temple
C
Manda epicycle


1.0 Km
1.0 krta yuga
Koh Ker
Prasat Thom
Rahal
500 m
To centre of Preah Khan KS

Suryavarman I was also the founder of the big city of Preah Khan of Kompong Svay located at 95 km to the east of Angkor Wat. It is probable Preah Khan KS was the king's provisional capital. The unusual orientation of the complex (28° north of east), which has never been explained so far, is probably related to Saturn's diagram. The loxodrome running from the central temple along the axis of the city crosses indeed the centre of the Sighra epicycle of Saturn. The latter axis is perpendicular to the loxodrome running from the central temple to the centre of the Rahal Baray of Koh Ker.


1.0 Km
1.0 krta yuga
Manda epicycle
R = 16.617 km
Centre of Sighra epicycle
To Saturn
To centre of Preah Khan KS

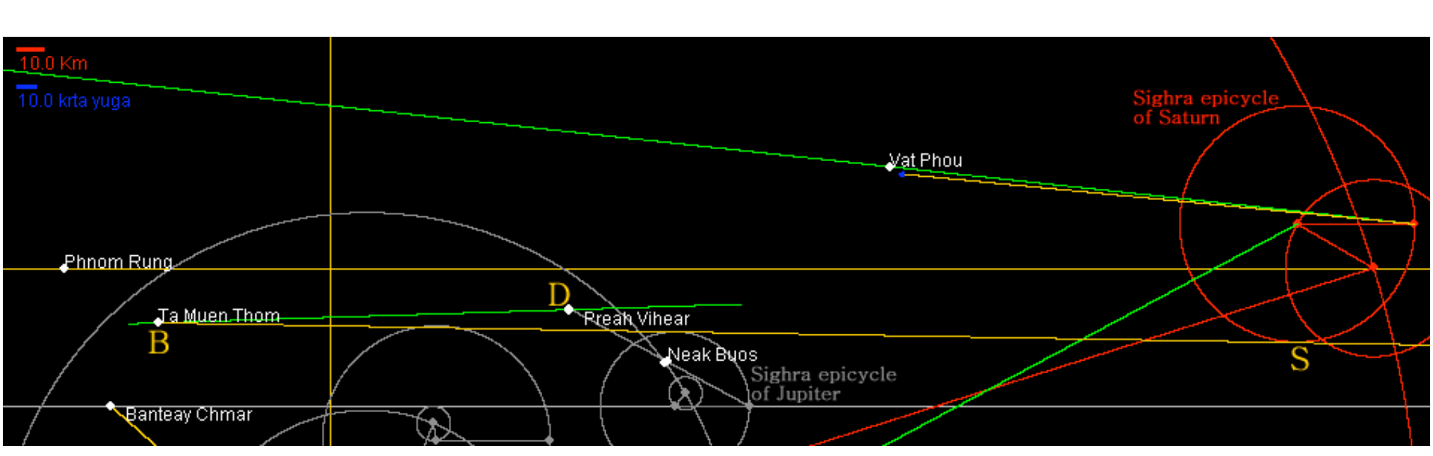

46.490 km
298.484 km
1.0 Km
1.0 krta yuga
To centre of baray of Koh Ker
-118.066°
To centre of Sighra epicycle of Saturn
-28.126°
Preah Khan KS
4500 m

The location and the dimensions of the city of Preah Khan determine two ratios related to the Sighra epicycle of Saturn:

1) 4500 / 500 = 9 = Sighra ratio of Saturn.
With 4500 m = width of median dyke of Preah Khan and 500 m = width of Rahal Baray of Koh Ker

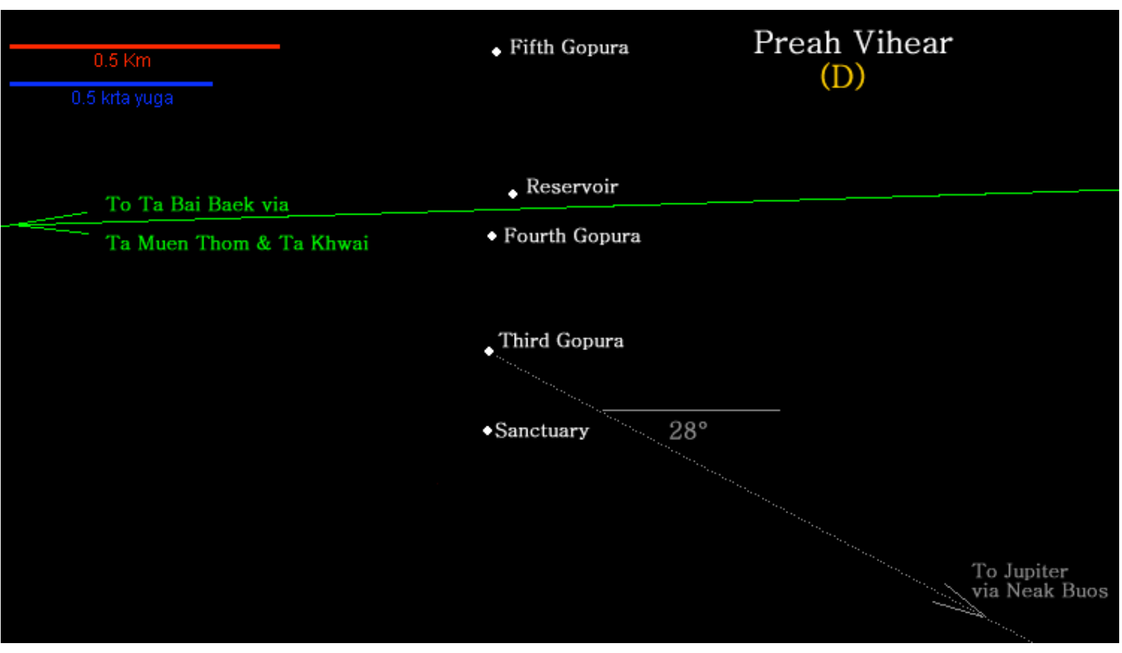
2) 46.490 / 46.617 = 0.997
With 46. 490 km = distance from centre of Preah Khan to centre of Rahal Baray and 46.617 km = radius of Sighra epicycle of Saturn.

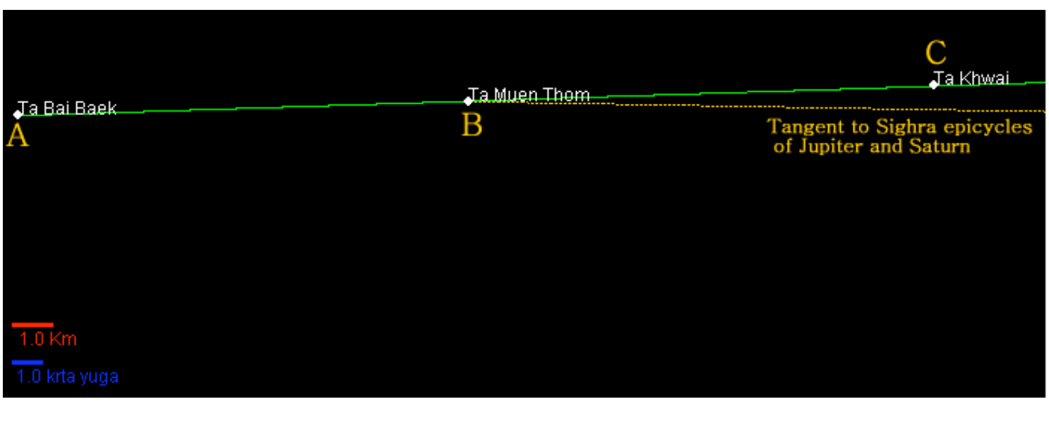
The Ta Muen Thom temple was built at the intersection of the southern limit of Dangrek Range with a loxodrome (BS) which is tangent to the Sighra epicycles of Saturn and Jupiter.

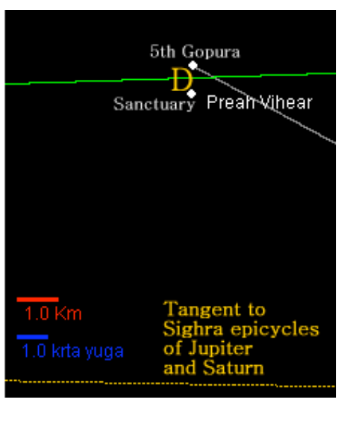

10.0 Km
10.0 krta yuga
Sighra epicycle of Saturn
Vat Phou
Phnom Rung
D
Ta Muen Thom
B
Preah Vihear
Neak Buos
Sighra epicycle of Jupiter
S
Banteay Chmar

Asger Mollerup has shown previously that the Ta Muen Thom temple was located on a loxodrome which crosses three other temples located in the Dangrek Range :
- The small temples of Ta Bai Baek and Ta Khwai
- The big complex of Preah Vihear

Theoretically, this loxodrome crosses the Preah Vihear's meridian between the fourth Gopura and the reservoir but it is possible the intended « target » was the third Gopura. We'll see indeed that a loxodrome (28°) running through the latter Gopura and Jupiter crosses the site of Neak Buos.
We have discovered those temples are separated by integers of kam.


0.5 Km
0.5 krta yuga
Fifth Gopura
Preah Vihear
(D)
Reservoir
To Ta Bai Baek via
Ta Muen Thom & Ta Khwai
Fourth Gopura
Third Gopura
Sanctuary
28°
To Jupiter via Neak Buos


Ta Bai Baek
A
Ta Muen Thom
B
C
Ta Khwai
Tangent to Sighra epicycles of Jupiter and Saturn
1.0 Km
1.0 krta yuga


5th Gopura
D
Sanctuary
Preah Vihear
1.0 Km
1.0 krta yuga
Tangent to Sighra epicycles of Jupiter and Saturn

The location of Saturn is indicated by the intersection of two loxodromes:

1) A huge loxodrome (551.5 km) running through the centre of the Phimai temple and through the natural Linga (Lingaparvata) standing on the summit of the Phou Kao Mountain (L) which overhangs the site of Vat Phou.

2) A loxodrome running along the great axis of the Vat Phou's barays (B). Its azimuth is 5.6° south of east.

The natural Linga (Lingaparvata) standing on the summit of Phou Kao Mountain (L)

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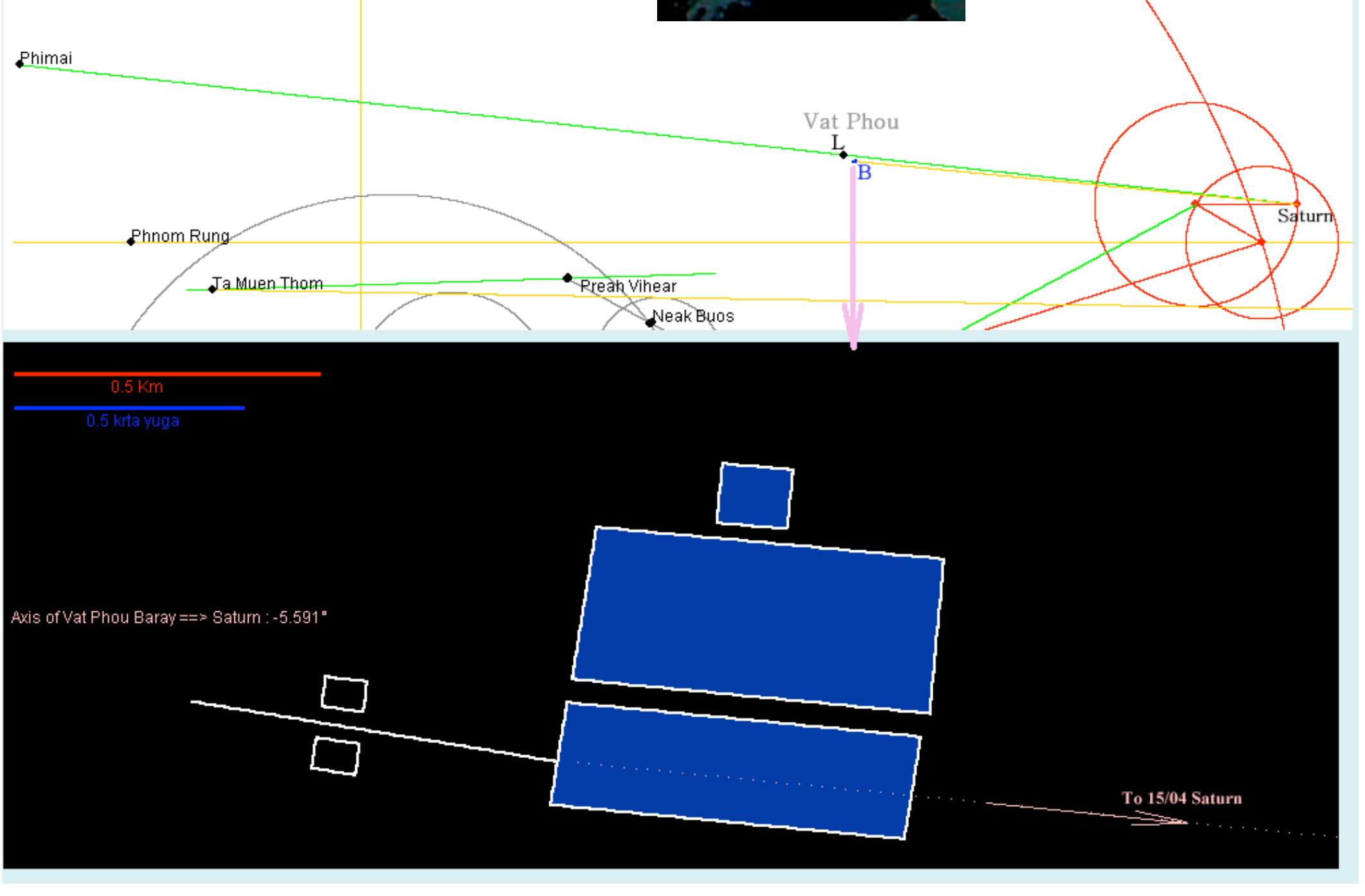
Corresponding JAVA applet


20.0 Km
20.0 krta yuga
Phimai
Vat Phou
L
B
Saturn
Phnom Rung
Ta Muen Thom
Preah Vihear
Neak Buos
0.5 Km
0.5 krta yuga
Axis of Vat Phou Baray ==> Saturn : -5.591°
To 15/04 Saturn

Corresponding JAVA applet

It is worth noting that the azimuth of Saturn , as observed from Phnom Bok, is -19° (from due east).

The true longitude (from Sun) on 15/04/967 CE at 23:58:12 was -19.1°.

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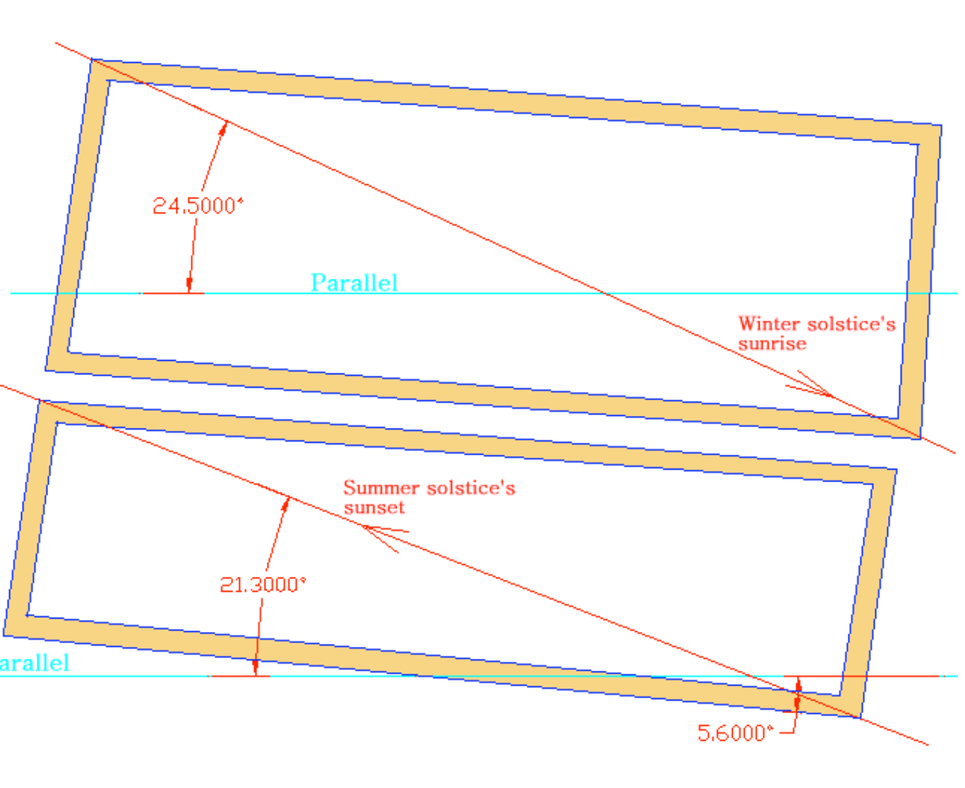
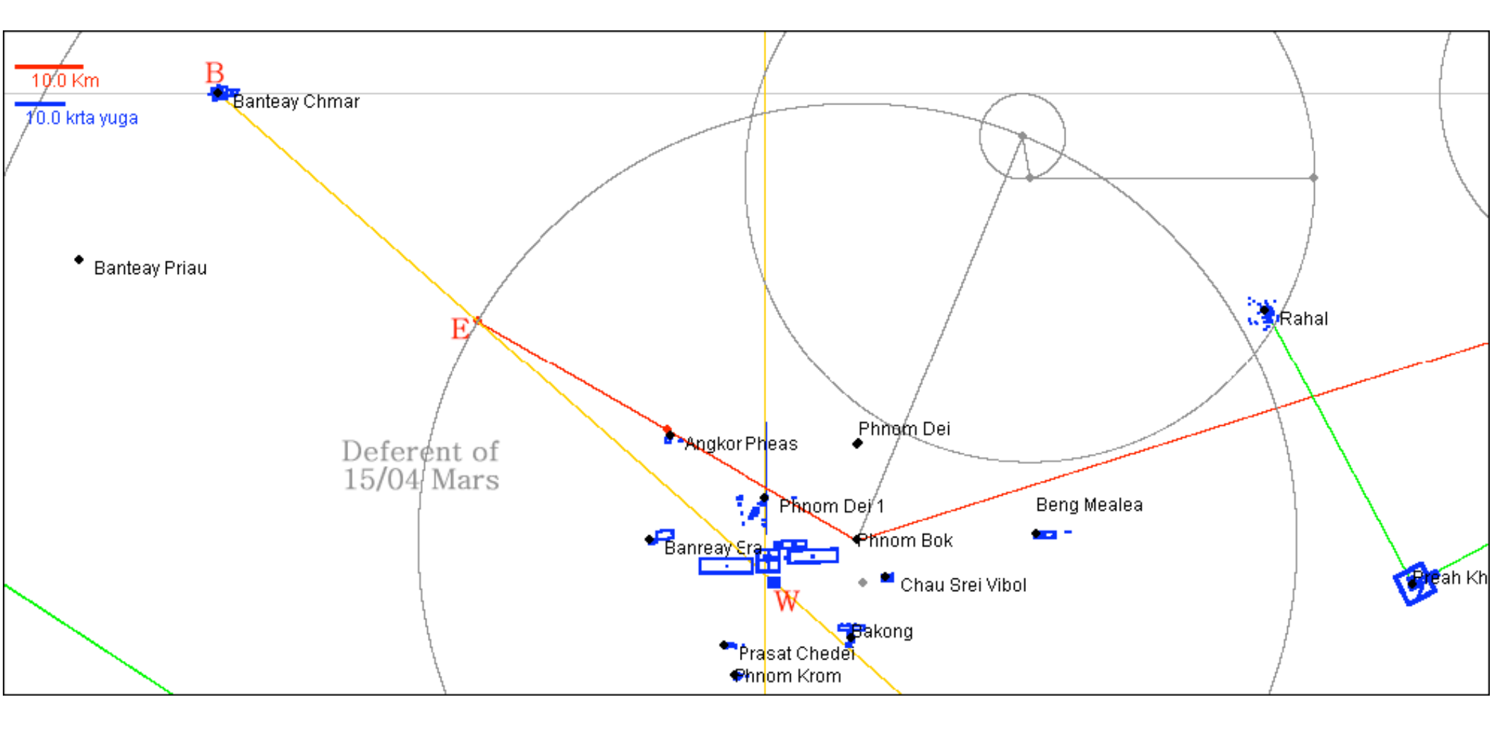
Table of 15/04 Saturn

Foreground : the causeway and the barays of Vat Phou Background : the Mekong River
By courtesy of Frans & Claire van der Lee http://www.everywheremag.com/places/4807/20633

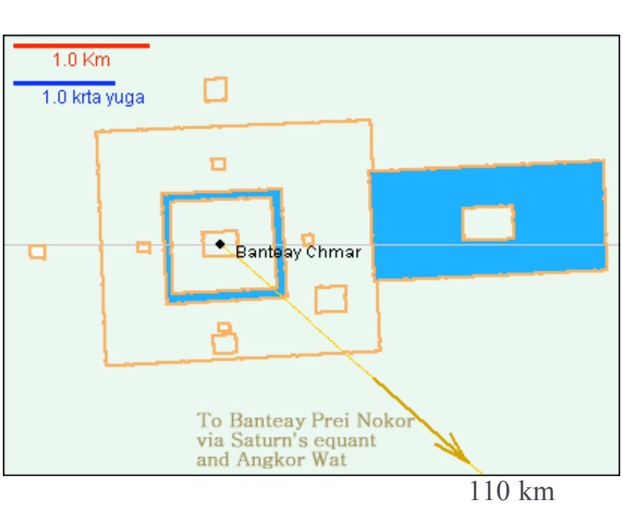
Although it is not related to the diagram of Saturn, it should be noted that the solsticial line of Vat Phou is "broken" by the presence of the Phou Kao Mountain (N-W). This explains why two barays were constructed side by side. The diagonal of the south baray indicates the azimuth of sunrise at winter solstice over the eastern slope of Mekong River. The diagonal of northern baray indicates the azimuth of sunset at summer solstice over the crest of Phou Kao Mountain.


24.5000°
Parallel
Winter solstice's sunrise
Summer solstice's sunset
21.3000°
Parallel
5.6000°

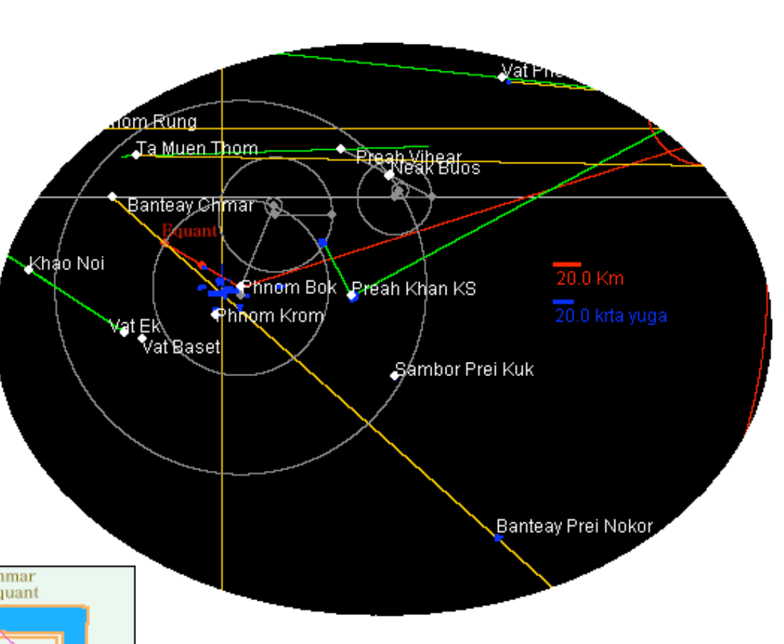
The equant (E) of Saturn was located on the intersection of the Mars' deferent with the loxodrome running from the centre of **Angkor Wat** (W) to the centre (B) of the **Banteay Chmar**'s temple. We have seen that the loxodrome WB is the continuation of the diagonal of Angkor Wat's moat

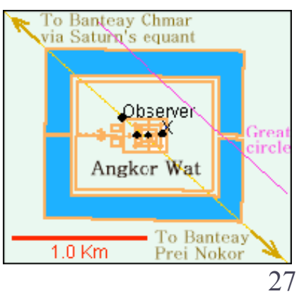

10.0 Km
10.0 krta yuga
B
Banteay Chmar
Banteay Priau
E
Rahal
Deferent of 15/04 Mars
Angkor Pheas
Phnom Dei
Phnom Dei 1
Phnom Bok
Beng Mealea
Banteay Srei
W
Chau Srei Vibol
Preah Khan
Bakong
Prasat Chedei
Phnom Krom

The continuation of the loxodrome BW to the south-east crosses **Banteay Prei Nokor**. It runs at 320 m from the towers of Preah Theat Tauch. By taking into account the distance between the latter monument and the central sanctuary of Banteay Prei Nokor, this distance of 320 m corresponds to a relative error of 0.08%.


1.0 Km
1.0 krta yuga
Banteay Chmar
To Banteay Prei Nokor via Saturn's equant and Angkor Wat

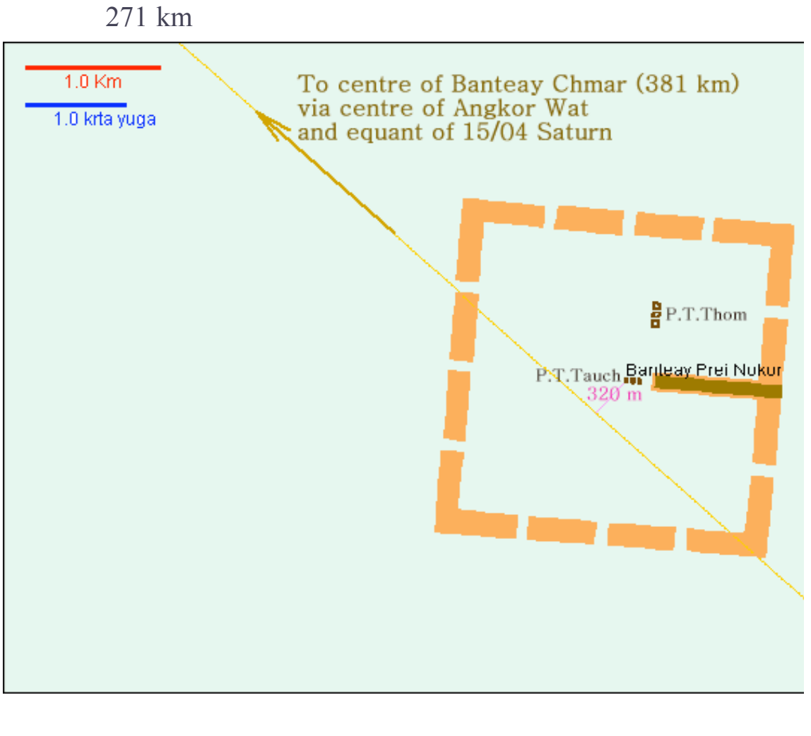
110 km


Vat Phou
Phnom Rung
Ta Muen Thom
Preah Vihear
Neak Buos
Banteay Chmar
Khao Noi
Phnom Bok
Preah Khan KS
Phnom Krom
Vat Ek
Vat Baset
20.0 Km
20.0 krta yuga
Sambor Prei Kuk
Banteay Prei Nokor

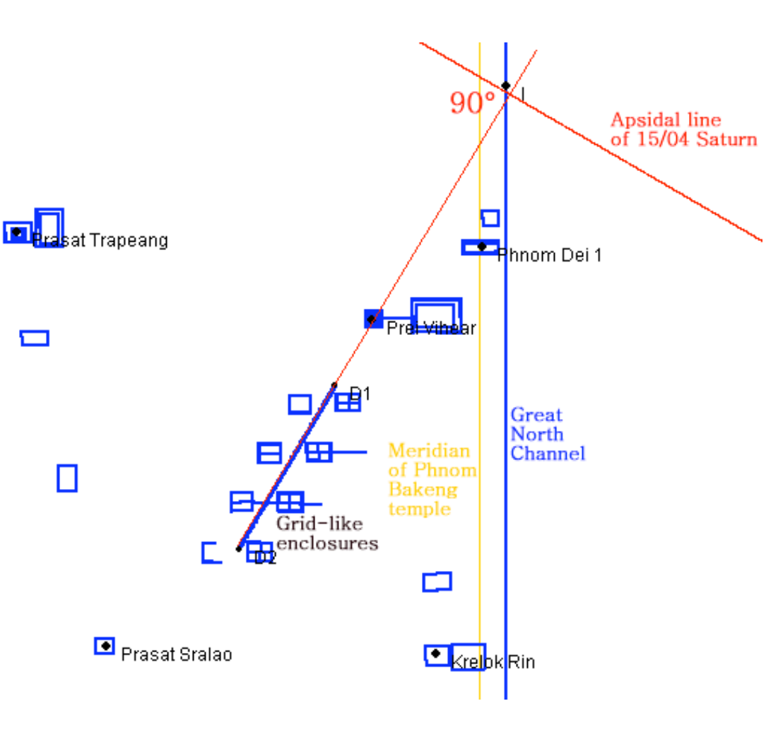

To Banteay Chmar via Saturn's equant
Observer
Great circle
Angkor Wat
1.0 Km
To Banteay Prei Nokor

271 km

It is worth noting that, on such distances, the trajectories of loxodromes and orthodromes (great circles) are obviously different. A great circle crossing the loxodrome in Banteay Chmar and Banteay Prei Nokor runs through the north-east part of Angkor Wat (pink line). We think the Khmer conceived their alignments on the basis of loxodrome-like lines.


1.0 Km
1.0 krta yuga
To centre of Banteay Chmar (381 km) via centre of Angkor Wat and equant of 15/04 Saturn
P.T.Thom
P.T.Tauch
Banteay Prei Nokor
320 m

Finally, the apsidal line (OE) of Saturn runs through the intersection of the Great North Channel with the axis of the "grid-like" enclosures discovered recently by the "Greater Angkor Project". This axis is perpendicular to the apsidal line (see image at right).


1.0 Km
1.0 krta yuga
90°
Apsidal line of 15/04 Saturn
Prasat Trapeang
Phnom Dei 1
Prei Vihear
Meridian of Phnom Bakong temple
Great North Channel
Grid-like enclosures
Prasat Sralao
Krabok Rin

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http://ancientcartography.net/HinterlandSaturn15.pdf

Main Page

Corresponding JAVA applet

Last modification : 25 / 01 / 2009

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jpl@ancientcartography.net
rab1@ancientcartography.net