On the Dating of the Jyotisa Vedanga

Aman Chawla

February 8, 2024

Abstract

In this exploratory note, the authors report initial studies of the close proximity of the winter solstice and the position of alpha Delphini around 39376 BCE. The note is pertinent for a dating of the earliest Vedanga texts on Jyotisa or astrology based on internal textual and astronomical evidence.

A simple MATLAB program (see Algorithm 1) is constructed based on Chapter 20 of [1]. It plots out (Figure 1) the angular distance between the winter solstice and the position of alpha Delphini at different times. The plot is supposed to be accurate only for small epochal intervals so these initial findings are to be taken with a grain of salt.

Nevertheless, it is interesting to note that the time-scales involved are humongous as compared to the handful of millennia usually reported in studies of the Indo-aryans (see Section 30 of [2]). However, we should reiterate that this may be an artifact of the inaccuracy of the algorithm used for large time intervals, as mentioned by the author of [1]. This limitation should be addressed in future work. Furthermore, checks for algorithmic internal consistency should also be done by making use of the Examples presented by Meeus. This is also to be addressed in future work.

Acknowledgments

The author thanks OpenAI for access to ChatGPT-4.

Appendix 1: Main Algorithm

References

[1] Jean H Meeus. *Astronomical algorithms*. Willmann-Bell, Incorporated, 1991.

[2] Michael Witzel. Autochthonous aryans? the evidence from old indian and iranian texts. 2001.

Algorithm 1 Main algorithm which calls various methods.

```
close all;
clear all;
clf;
clc;
i = 1;
for c = -500:1:-1
centuries = c;
[raH1, raM1, raS1, decD1, decAM1, decAS1] = alphaDelphini(centuries);
[raH, raM, raS, decD, decAM, decAS] = winterSolctice(centuries);
distance(i) = angularDistance(raH1+(raM1/60)+(raS1/3600),
decD1+(decAM1/60)+(decAS1/3600), raH+(raH/60)+(raH/3600),
decD+(decAM/60)+(decAS/3600))
if raH == raH1
if raM == raM1
if raS == raS1
if decD == decD1
if decAM == decAM1
if decAS == decAS1
disp("match");
disp(c)
break;
end
end
end
end
end
end
i = i + 1;
end
figure(1)
plot(-500:1:-1,distance)
i = 1;
for c = 1:1:500
centuries = c;
[raH1, raM1, raS1, decD1, decAM1, decAS1] = alphaDelphini(centuries);
[raH, raM, raS, decD, decAM, decAS] = winterSolctice(centuries);
distance2(i) = angularDistance(raH1+(raM1/60)+(raS1/3600),
decD1+(decAM1/60)+(decAS1/3600), raH+(raH/60)+(raH/3600),
decD+(decAM/60)+(decAS/3600))
if raH == raH1
if raM == raM1
if raS == raS1
if decD == decD1
if decAM == decAM1
if decAS == decAS1
disp("match");
disp(c)
break;
end
end
end
end
end
end
i = i + 1;
```

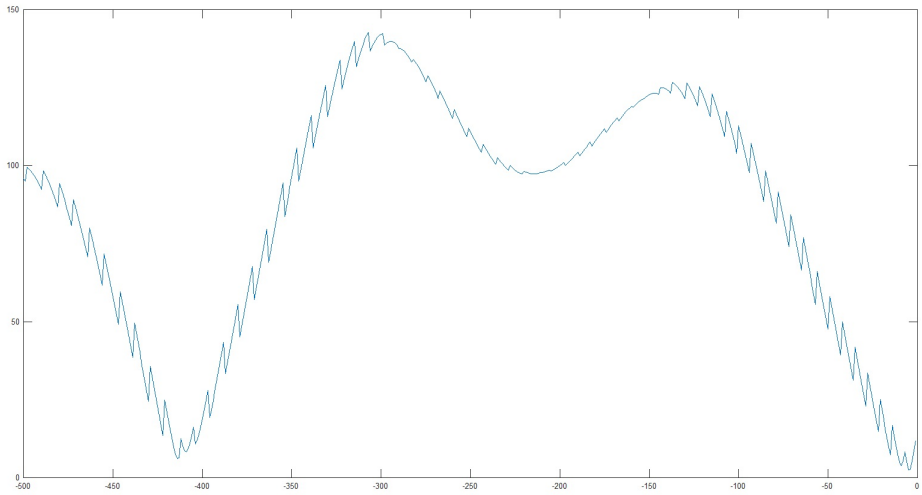

Figure 1: The x-axis is time in centuries with the origin being today. The y-axis is the angular distance between the winter solstice and alpha Delphini. Closest approach after the initial proximity is at around -414 centuries.