

Couple of energy source in geocentric model of universe - a scientific idea of Vedic astronomers

Anal Chandra Sarma

Dept. of Physics, Patkai Christian College, Chumukedima, Nagaland

Email: acspatkai@gmail.com

ABSTRACT: Vedic astronomers considered the earth at the centre of the universe and thus developed a model of geocentric universe. In order to have a geocentric universe they might have felt the need of a divine source of energy at a distance of 180° from Sun. This divine source of energy is the chief Rigvedic deity Indra. According to Rigveda, the Sun and Indra are always at opposite positions to each other. The Aaditya who drink the soma juice on full moon day is none other than Indra. There are many verses in Rigveda which indicate that Indra always remains at opposite positions to the Sun. The sun and Indra form a couple of energy source which rotate the universe around the earth in geocentric universe. This idea is similar to the couple of force required to rotate a body according to physics.

Keywords: Vedic astronomer, geocentric universe, Rigveda, Vedanga Jyotisa, Indra, soma juice

Introduction

The origin of Indian astronomy is traced back to vedic period. Vedic people used the position of stars in the night sky as guide for travelling from one place to others. Rise of particular constellation of stars on the eastern horizon foretold the times of planting and harvesting of crops. Astronomy is one of the six vedangas, a subsidiary literature of the Vedas and known as Vedanga-Jyotisa i.e. the science of light as well as nakshatra vidya i.e. the science of stars. Vedanga Jyotisa is the earliest literature describing the motions of the sun and the moon⁽¹⁾. Beside Vedanga-Jyotisa, the Vedic astronomy is found in the vedic samhitas and brahmanas and other allied literatures. Vedanga-Jyotisa defines jyotisa (astronomy) as the science of time determination that deals with days, seasons, years and various heavenly phenomena like rising of nakshatras, new moon, full moon etc. Vedic priest used knowledge of astronomy to predict the time of scarifies accurately in advance. The aim of astronomy was to study the natural divisions of time such as days, months, seasons and years, caused by the motion of the Sun and Moon. Thus

astronomy in vedic period was essentially science of time determination necessary for the vedic sacrifices and other religious observances⁽²⁾. Though vedic literature talks about astronomical phenomena it is only in 20th century that the astronomical basis of Vedas has been examined⁽³⁾. The publication of the book "Hamlet's Mill: An essay on myth and the frame of time" by Georgio de Santillana and Hertha von Dechend in 1969 gave a general recognition that ancient myths consists of astronomical knowledge⁽⁴⁾.

Rigveda describes the universe as infinite and made up of the earth, the atmosphere and the sky consisting of the Sun, the moon, five planets and twenty-seven nakshatras i.e. constellation of stars⁽²⁾. The apparent path of the sun i.e. the ecliptic was divided into six equal parts their deities were known as Aadityas. The path of the moon was divided into 27 equal parts having constellations of stars and these were known as nakshatras. Rigveda mentions constellations other than nakshatras like Great Bear i.e. Saptarsi, Little Bear, Canis Major, Canis Minor, Agro Navis, Oroin i.e. Mirga etc. Atharvaveda mentions about other heavenly bodies like ulka i.e. meteors,

dhumaketu i.e. comets and heavenly phenomena like eclipses caused by Rahu⁽²⁾. Eclipses are also mentioned in Gopatha Brahmana of Atharvaveda⁽⁵⁾ and Satapatha Brahmana⁽⁶⁾. The 34 lights mentioned in Rigveda means the sun, the moon, the five planets and the 27 nakshatras⁽¹⁾. Study of the apparent movement of various constellations of stars and other celestial body with respect to earth played an important role in the evolution of human civilizations.

Materials and Method

The vedic astronomy has been narrated in terms of Sanskrit verses in Vedanga Jyotisa as well as vedic samhitas like Rigveda, Artharvaveda and Brahmanas. However the materials for this study have been collected from secondary sources of ancient Indian astronomy like English translation of Vedas and allied literature as well as some research works carried out on ancient Indian astronomy during the period from early 20th century till early 21st century. The collected materials were studied carefully and systematically. Finally the findings were summarized and have been presented here in the following section.

Result and Discussion

Study of path of the sun and the moon on celestial sphere was an important part of vedic astronomy in order to predict the time of sacrifices by vedic priest well in advance. The path of the sun as well as the moon on the celestial sphere are great circles inclined to each other at an angle of around 5 degree⁽⁷⁾. The path of the sun known as ecliptic is fixed and does not change with time whereas the path of the moon relative to neighboring stars on the celestial sphere keeps on shifting from month to month and also from year to year. For vedic astronomer, finding the path of moon relative neighboring stars on the celestial sphere was comparatively easier than the path of the sun as the moon appears in the night sky

whereas after sun rise stars are not visible in the day time.

However vedic literatures reveal that vedic astronomers not only studied the motion of the sun and moon but also studied the celestial objects visible in the night sky. Moon takes around 27 days to revolve round the earth. This is actual motion of the moon. However observing the apparent motion of the Sun and constellation of stars around the earth, vedic astronomers thought that they also move round the earth. Thus vedic astronomers considered the earth at the centre of the universe i.e. a geocentric universe. The Sun has been described as the controller and lord of this geocentric universe in Rigveda⁽²⁾. In order to have a geocentric universe, vedic astronomers might have felt the need of a divine source of energy opposite to the sun i.e. at an angular distance of 180 degree from the sun. This divine source of energy is the chief Rigvedic deity Indra. Similar idea was proposed by P.V. Holay in his research work⁽⁸⁾.

There are many references in vedic literatures which indicate that chief Rigvedic deity Indra occupies a celestial point 180 degree away from the sun. According to Taittiriya Samhita the Moon is known as Surya-Rasmi i.e. the object which shines by sunlight⁽⁹⁾. Vedic literature says that the full moon is a round flask which gradually filled with soma juice and on full moon day it touched the lips of Aaditya and returned from the other direction. The full moon position is 180 degree away from the sun and thus the drinking of soma juice by Aaditya occurs at an angular distance of 180 degree away from the sun.

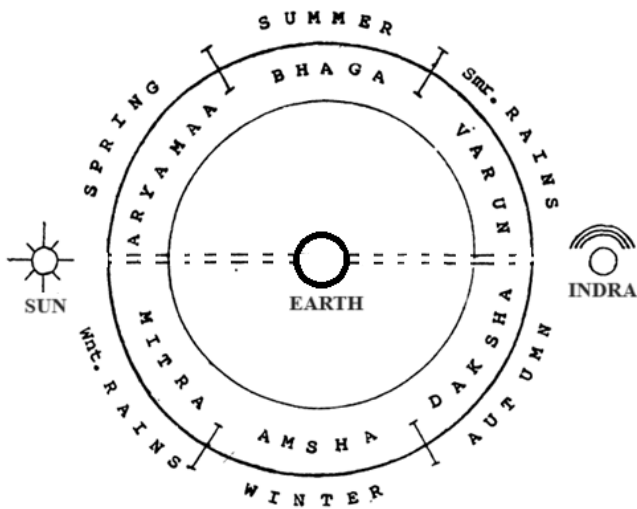


Figure 1: The eight Aadiyas, six seasonal Aadiyas occupies opposite positions in ecliptic. The sun and the chief Rigvedic deity Indra occupies opposite positions in celestial sphere.

In early vedic period the ecliptic was divided into six equal parts, each part corresponds to one seasons (Figure 1). The Aadiyas are the deity of seasons and for six different seasons there are six corresponding Aadiyas. According to Rigveda these Aadiyas are Bhaga, Varun, Daksa, Amsha, Mitra and Aryama. Indian climate has six seasons – Grisma (summer), Varsha (summer rains), Sharada (autumn), Hemanta (dry winter or winter), Shishira (winter rains) and Vasant (spring). The six Aadiyas Bhaga, Varun, Daksa, Amsha, Mitra and Aryama are the deities of Grisma, Varsha, Sharada, Hemanta, Shishira and Vasant respectively. These Aadiyas maintain cyclic order (Figure 1). Bhaga occupies opposite position to Amsha. Similarly Varun and Daksha take opposite position to Mitra and Aryama respectively. In Rigveda there is also mention about eight Aadiyas. Vedic literatures give a list of these eight Aadiyas and they are grouped in four pair: Daksa-Aryama, Mitra-Varuna, Amsha-Bhaga and Indra-Vivaswata⁽¹⁰⁾. Thus in vedic literature chief Rigvedic deity Indra is regarded as one of the Aadiyas. In the first three pairs, the seasonal Aadiyas on opposite side are grouped

together. In the fourth pair, Vivaswata means the sun and hence Indra is a point opposite to the sun i.e. 180 degree away from the sun⁽⁸⁾. On full moon day the moon is completely filled with soma juice and is at a point opposite to the sun i.e. 180 degree away from the sun (Vivaswata). The chief Rigvedic deity Indra is present at the position of full moon and the Aaditya who drinks this soma juice on full moon day must be none other than Indra. During vedic period, soma juice was a fundamental offering of vedic sacrifices.

The chief Rigvedic deity Indra is also known as “sapta rashmi vrishabha” i.e. a bull emitting seven rays. Indra occupies the centre of rainbow which contains seven colour and thus he is known as sapta rashmi vrishabha. Rainbow is always seen at opposite to the sun and thus the position of Indra can be considered at 180 degree away from the sun.

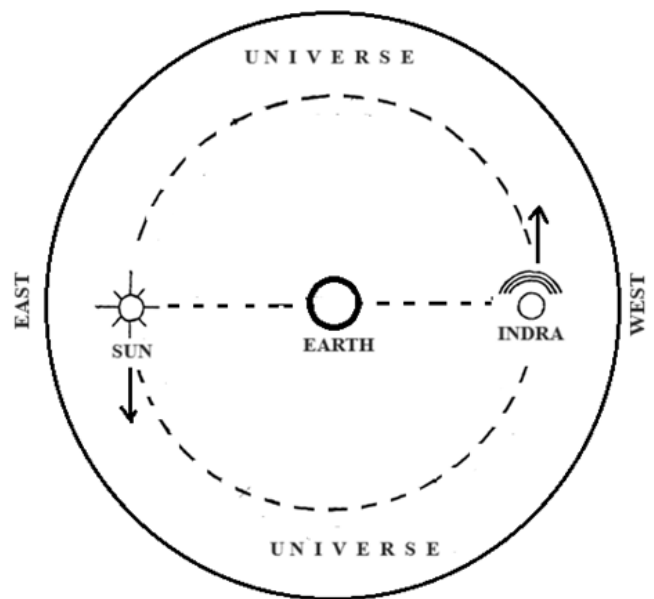


Figure 2: The Sun and the chief Rigvedic deity forming a couple of energy sources.

Like the other six seasonal Aadiyas, the sun and Indra also form a pair of Aadiyas. The sun is the visible Aadiya and Indra is the invisible Aadiya like other seasonal Aadiyas. The sun and the chief Rigvedic deity Indra form a couple of

energy sources(Figure 2). In vedic literature Indra has been described as a traveler in celestial sphere travelling in his “chariot” pulled by seven horses. Indra takes two months to travel region of any one of the six seasonal Aadityas, thus takes 12 months to complete one cyclic path in celestial sphere. The sun god also has been described as a traveler in the ecliptic in his “chariot” which is also pulled by seven horses. The seven horses in the “chariot” of the sun god symbolically represent the seven color present in sun rays. Similarly the seven horses in the “chariot” of the chief Rigvedic deity Indra symbolically represent the seven color present in rainbow and signifies the name of Indra as “sapta rashmi vrishabha”. At midnight Indra occupies the topmost position of the celestial sphere i.e. the *zenith* while the sun occupy the *nadir* point. Vedic astronomers might have felt the necessity of a couple of energy source formed by the sun god and chief Rigvedic deity Indra to rotate the universe keeping the earth at centre. This couple of energy source is similar to the couple of force required to rotate a body about an axis. In physics, a couple of force is a system of two parallel forces separate by a finite distance. The two forces are equal in magnitude and but opposite in direction.

Conclusions

In this paper, the role of chief Rigvedic deity Indra in a geocentric universe has been investigated. The finding are

- (i) The chief Rigvedic deity Indra occupies a position 180 degree away from the sun in the celestial sphere. Same conclusion was proposed by P.V. Holay in 1998.
- (ii) The Aaditya who drinks soma juice on full moon day is none other than Indra.
- (iii) The sun and the chief Rigvedic deity Indra form a couple of energy sources necessary to rotate the universe round the earth.

Thus it can be concluded that Vedic astronomers had the scientific idea about the necessity of couple of energy sources to rotate a system of object like universe about its centre. This idea is similar to the couple of forces in physics which is required to rotate an object about an axis.

References

1. Kak S. C. 2000. Astronomy and its Role in Vedic Culture, Chapter 23 in Science and Civilization in India, Vol. 1, The Dawn of Indian Civilization, Part 1, edited by G.C. Pande, ICPR/Munshiram Manoharlal, Delhi, 2000, pp. 507-524
2. Shukla K.S. 1987. Main Characteristics and Achievements of Ancient Indian Astronomy in Historical Perspective, International Astronomical Union Colloquium, Volume 91: History of Oriental Astronomy, 1987, Pp. 9-22. DOI: <https://doi.org/10.101/S0252921100105809>
3. Kak S. C. 1992. Astronomy of the Vedic Altars and the Rigveda , Mankind Quarterly, 33, 43-55.
4. Santillana G. de and Dechend H. von, 1969. Hamlet’s Mill: An essay on myth and the frame of time. Gambit, Boston.
5. Atharva-samhita, Tr. English by M.Bloomfield as Hymns of the Atharvaveda, Clarendon Press, Oxford, 1897.
6. Satapatha-brahmana, Ed. A. Weber with extracts from the commentaries of Sayana, Harisvamin and Dvivedaganga, Leipzig,1924; Second edition, Chowkhamba Sankrit Series No.97, Varanasi.
7. Mohan C. 2015. The Story of Astronomy in India (Book).

<https://www.researchgate.net/publication/288838271>

8. Holay P. V. 1998. Vedic Astronomers, Bull. Astr. Soc. India, 26, 91-106.

9. Taittiriya Samihita, Tr. A.B. Keith, Harvard Oriental Series, 18, 19, 1914.

10. Tilak B.G. 1925, Aric Home of the Vedas, Published by Tilak Brothers, Pune.