



**ORIGINAL RESEARCH PAPER**

**Geophysics**

**EARTH AXIS PART 3. CONCLUDING. A CRITICAL EVALUATION OF EARTH'S OBLIQUITY AND ORBIT AROUND THE SUN: SUNRISE ANGLE OF INCLINATIONS, ON LONGEST, SHORTEST, AND EQUINOX DAY AT VARIOUS PLACES OF NORTH AND SOUTH HEMISPHERES OF EARTH, WITH REVIEW LITERATURE.**

**KEY WORDS:** Sunrise Inclination Angle, Plane of Orbit, Solar Solstice, Obliquity.

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**ABSTRACT** The sun being powerful, why earth axis fixed and tilted, with fixed horizontal orbit? Earlier published research part 1 and 2, the angle formed between solstices, and shadow shift pattern, proved earth shift, and sun fixed, earth axis neither tilted, nor earth orbit is horizontal. Obliquity is apparent. Part three concluding study is about measurement of sunrise inclination angle at various places on earth. Sunrise angle found to be 30° in summer, 60° in winter, and 90° at both equinoxes, on both the hemispheres. This is due to the oblique orbit of earth around the sun. Subject reviewed with literature from Vedic era to modern science, and the causes of season change on earth, is discussed.

**INTRODUCTION**

Celestial events and cosmic drama going on since antiquity. It follows the uniform laws of nature and cosmos. Human understanding is ironic, strange. Day-nights are due to earth's spinning on axis while sun stationary. The International Astronomical Union defines a planet's tilt. This was viewed with doubt by Milankovitch cycle theory, Hugh Leyton<sup>1,2,3</sup>. "Is the tilt of earth's axis absolute or do the earth shift? How truthful is Obliquity of the Earth Axis tilted to 23.5° and fixed, earth orbiting Sun is at horizontal plane and fixed. Is the obliquity only, responsible for seasons on Earth and shapes ecosystem and behavior of living beings?" Can this be proved or different truth can be established? Experiments carried out on different places of the globe using the Sundial. The study was published in peer reviewed global journals<sup>4,5,6,7</sup>.

**MATERIAL AND METHODS**

The sunrise inclination angle measured, using Divider of school compass box, on longest, shortest, and equinox days on both hemispheres of earth. The time is not uniform at different places. It varies, in Delhi at altitude is 28.6 the inclination angle is not 30° similarly in Sydney on equinox day is not 90°. Therefore, measurement is considered on longest, shortest and equinox days only.

**RESULTS AND OBSERVATIONS**

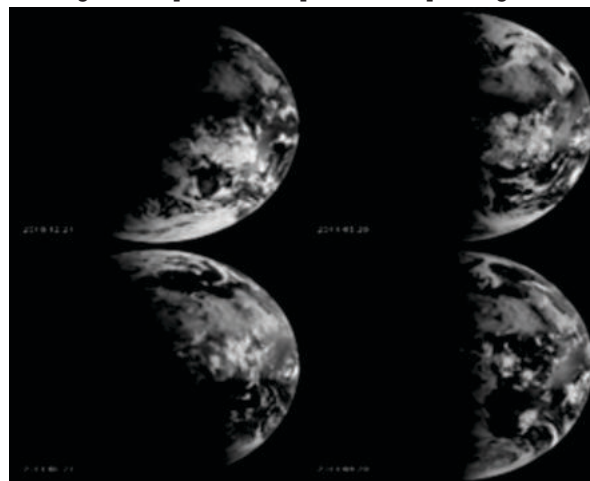
The earth rotates in six months period, North – South and in next six months south - North. The sunrise inclination on longest, shortest and equinox days on both hemispheres recorded at a fixed time at Delhi, Port Blair, in Summer 30° SW, winter 60° SE, equinox 90° W in March, similarly Summer of Sydney, is 30° NW, winter 60° SE, equinox 90° SW direction. The place of recording is not exactly at longest, shortest, or equinox day. Therefore, approximate inclination taken into consideration.

**DISCUSSIONS**

The shadows are not real but based on reality, appear opposite to the light source. The shadows Optic illusion cannot be ignored. What one sees may not be truth. Truth hidden in illusion, must be explored. Science involved in shadows is very important in sundial experiment. Vedic view about eclipse is based on shadows. Solstices are explained in Atharva Ved. Two solstices make one year. The controller of seasons (RITUPAATI) is Aadi-agni and the Sun (fractioned Agni), Aadi Vayu (primordial gasses), Electromagnetic energy, Rays, waves, clouds, nature etc<sup>1</sup>.

The Sun crosses the Celestial Equator twice in a year, March 21 and September 22. These are called Spring and Autumnal Equinox, having equal day-night<sup>4,5,6,7</sup>.

Milankovitch theory and Hugh Leyton Engineer (1960–2023) believes that the Earth's axis is not steady<sup>8</sup>. The Earth's obliquity measured as early as 1100 BC in India and China. The Greeks measured obliquity since Rigved time (350 BC)<sup>7,8,9</sup>. The changes of the four seasons, related to the position of sunlight on the planet, are captured from space Figure 2.

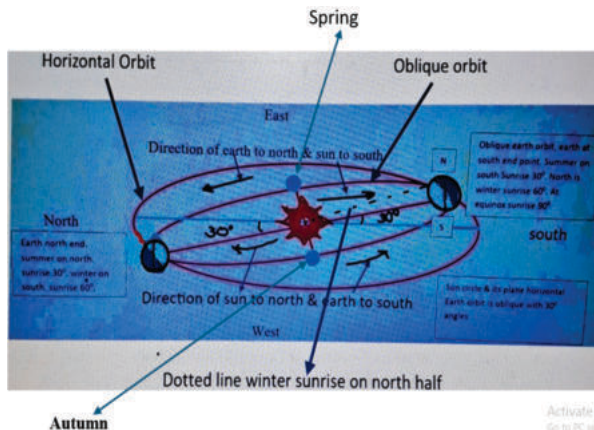


**Figure 2. Earth from Space**

Earth's spin around its axis causes Sunrise. The influence of Sun and Nakshatra, and other causes, affect different seasons on earth. Sun shuttles between imaginary lines on earth at 23.5 latitude North and South of imaginary central equator dividing earth into two hemispheres<sup>10,11</sup>.

The two pole stars, near Northern celestial point (NCP) and Southern celestial point (SCP) having 90° declinations at the horizon<sup>12,13</sup>.

Sunrise inclination can properly be measured on ocean beaches. Fixed time guidance at city, decided the sunrise and



**Figure 1. Sunrise Direction and Angles (Diagram by Anvita)**

timings in calendars, to record sunrise. The calendars of Akhand Bharat, mention that in summer the sun rises 30° southeast at equinox at 90° east, and in winter rises 60° southeast. Sun direction in Sacramento, www.sun-direction.com (USA) mentions similar sunrise angle in summer, winter and equinox, but on horizontal plane of orbit. This seems at par with the author's measurements. Earth's spinning on axis decides day and night<sup>7,8</sup>. Ved considered sun is stationary<sup>9</sup>. Surya-Sidhanta and Pancha-sidhantika are talking of tropical and not sidereal solstices and equinoxes: On Makara Sankranti, the day is the shortest, as the sun is at its maximum southern sojourn. Varahamihira was aware of the precession of equinoxes<sup>14,15,16</sup>,

The spherical earth (bhugol) in space (vyoman), special energy suspends it steady in space (bhugol vyoman)<sup>17</sup>. The Seasons on earth are influenced by rays, radiation, electromagnetic forces from space stars, nakshatra, galaxies and the ultimate truth responsible for cosmos and the nature<sup>7,8,12</sup>.

Sunrise angle of inclination will vary if earth's axis is tilted fixed and orbit is fixed horizontal. Equator of earth will not coincide with equator of sun. Sun rise will be at different angles. It will not be 30°, 60°, or 90°. Such angles are possible with earth's oblique orbit. The earth's obliquity is apparent. The Sun never sets or rises, sunrise is apparent.

### CONCLUSIONS

The following are the conclusions of the research:-

1. The 60° angles between extreme shadows, shifting of shadows, Clockwise- anticlockwise, proves that earth moves. Sun solstice is apparent.
2. Earth axis is not tilted but straight.
3. Obliquity is apparent as Earth orbit's plane is oblique. Sunrise in summer 30°, winter 60°, and equinox 90° establish obliquity of the earth's orbit. The earth does not shuttle but orbits the sun. Earth moves south-north, and sun appears shifting opposite. The North hemisphere faces sun in summer.
4. Sun crosses the sky with the same inclination angle, on longest, shortest, and equinox days from sunrise to sunset.
5. The sun shift is not 23.5° up to Cancer and Capricorn lines but is 30°.

**Suggestions:** The sojourn is of earth and not of the sun hence it must be renamed as earth sojourn. Nomenclature must be focused on north and south sojourns. Winter or summer names be avoided as when summer in north it is winter in south. The truth must be established and imparted in education systems.

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