

ASTRONOMICAL SURVEYING- II

Equinoctial Points.

The points of the intersection of the ecliptic with the equator are called the equinoctial points. The declination of the sun is zero at the equinoctial points. The Vernal Equinox or the First point of Aries (Υ) is the sun's declination changes from south to north, and marks the commencement of spring. It is a fixed point of the celestial sphere. The Autumnal Equinox or the First Point of Libra (Ω) is the point in which sun's declination changes from north to south, and marks the commencement of autumn. Both the equinoctial points are six months apart in time.

ecliptic and Solstices?

Ecliptic is the great circle of the heavens which the sun appears to describe on the celestial sphere with the earth as a centre in the course of a year. The plan of the ecliptic is inclined to the plan of the equator at an angle (called the obliquity) of about $23^{\circ} 27'$, but is subjected to a diminution of about $5''$ in a century.

Solstices are the points at which the north and south declination of the sun is a maximum. The point C at which the north declination of the sun is maximum is called the summer solstice; while the point C at which south declination of the sun is maximum is know as the winter solstice. The case is just the reverse in the southern hemisphere.

North, South, East and West Direction.

The north and south points correspond to the projection of the north and south poles on the horizon. The meridian line is the line in which the observer's meridian plane meets horizon place, and the north and south points are the points on the extremities of it. The direction ZP (in plan on the plane of horizon) is the direction of north, while the direction PZ is the direction of south. The east-west line is the line in which the prime vertical meets the horizon, and east and west points are the extremities of it. Since the meridian place is perpendicular to both the equatorial plan

as well as horizontal plane, the intersections of the equator and horizon determine the east and west points.

spherical excess and spherical Triangle?

The spherical excess of a spherical triangle is the value by which the sum of three angles of the triangle exceeds 180° .

Thus, spherical excess $E = (A + B + C - 180^\circ)$

A spherical triangle is that triangle which is formed upon the surface of the sphere by intersection of three arcs of great circles and the angles formed by the arcs at the vertices of the triangle are called the spherical angles of the triangle.

Properties of a spherical triangle.

The following are the properties of a spherical triangle:

1. Any angle is less than two right angles or π .
2. The sum of the three angles is less than six right angles or 3π and greater than two right angles or π .
3. The sum of any two sides is greater than the third.
4. If the sum of any two sides is equal to two right angles or π , the sum of the angles opposite them is equal to two right angles or π .
5. The smaller angle is opposite the smaller side, and vice versa.

Source : <http://www.nprcet.org/e%20content/Misc/e-Learning/CIVIL/IV%20SEMESTER/CE2254%20-%20SURVEYING%20II.pdf>