



TRINITY COLLEGE FOR WOMEN NAMAKKAL

Department of Physics

SOLAR ENERGY UTILIZATION

23PPHE15 - EVEN Semester

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Solar Radiation | Definition | Types ...



✓ Solar Radiation

✓ Its Types

✓ How it is measured?



ENGINEERING Textbook

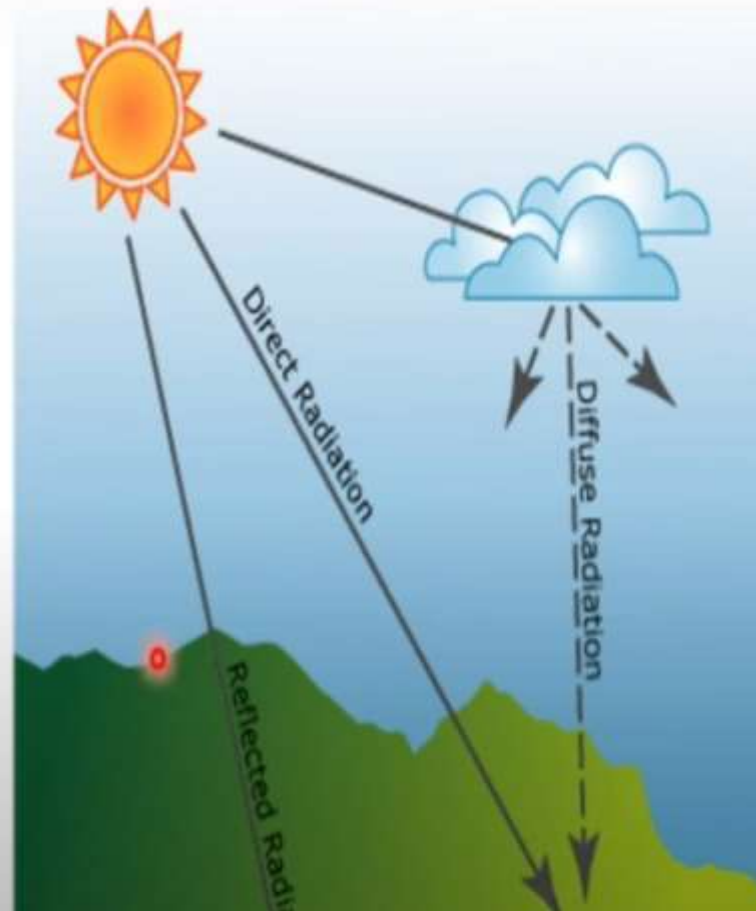
Harmful-skin

Solar Radiation | Definition | Types | M... Watch later

TYPES OF SOLAR RADIATION

Depending on the form in which it reaches the Earth

- Direct Solar Radiation
- Diffused Solar Radiation
ablando effect
- Reflected Solar Radiation
SO



Smaller the sun's altitude, greater the thickness of atmosphere through –solar radiation reaches the ground

Sun at Zenith: Position of the sun directly over head

Air Mass(m)=

Path of the sun rays through the atmosphere / length of the path when the sun is at the zenith

$m=1$ When sun is at zenith

$m=2$ When zenith angle is 60 degree

$m=\sec \theta$ When $m > 3$

$M=0$ just above the earth's atmosphere

ATTENUATION OF BEAM RADIATION:

Variation in solar radiation reaching the earth than received at the outside of the atmosphere due to absorption and scattering in atmosphere

ABSORPTION:

Short wave UV rays- Ozone in the atmosphere

Long wave IR ray-Co₂ and moisture in atmosphere

#Terrestrial solar energy 0.29 μ to 2.5 μ

SCATTERING- diffuse radiation

What is **Local Time (LT)** ?

1. **Local time (LT)** is **official time** in a particular state/region or country.
2. Or in easy meaning, the official time in one country/region, Everybody standardize with same "time" shows by their **WATCH/CLOCK**.

What is Local Solar Time (LST) or Solar Time?

1. Local Solar Time (LST) or Solar Time is the time set according to **position of sun** in the sky.
2. Twelve **noon** of Local Solar Time is described as when the **sun is highest** in the sky - **Solar noon**.

HOW TO CALCULATE LOCAL SOLAR TIME (LST) AND LOCAL TIME (LT)?

THE EQUATION....

$$\text{LST} = \text{LT} + 4 (\text{L site} - \text{LSTM}) + \text{EoT}$$

LST - local solar time

LT- local time

4 - Earth rotate 1degree longitude every 4 minutes (4 minutes per degree)

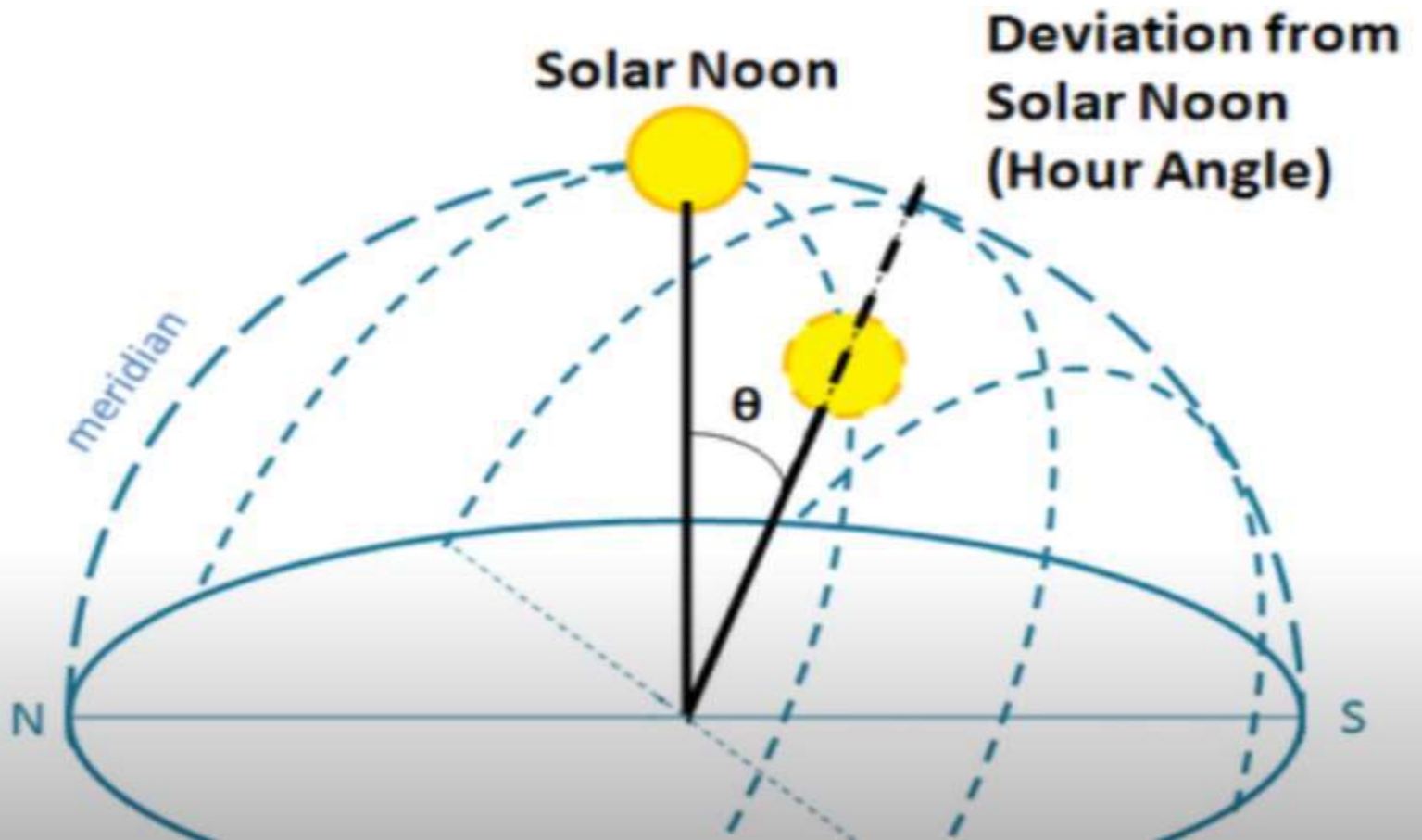
L site - longitude of the site

LSTM - local standard time meridian

EoT- Equation of time (adjustment in minutes)



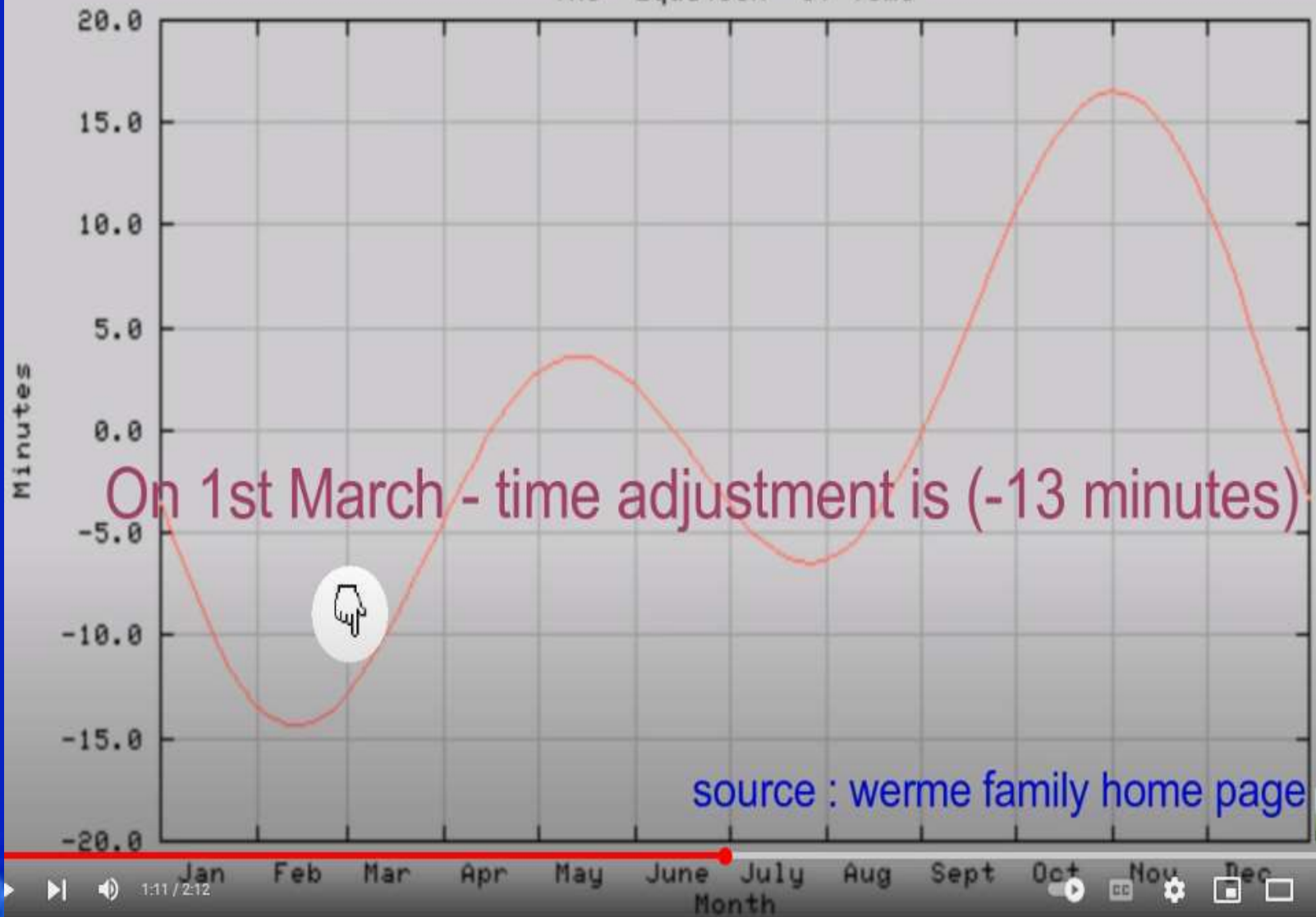
Search



The longitude of Isketambola city is 95 degree East of Greenwich Meridian.

a) If the longitude of Standard Meridian is 105 degree East of the Greenwich Meridian, calculate Local Solar Time (LST) when the Local Time (LT) is 3.00pm on 1st March.

The "Equation" of Time



THANK YOU

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