Satellite Communications

PRINCIPLE OF SATELLITE COMMUNICATION

Chapter One

Lecture 3

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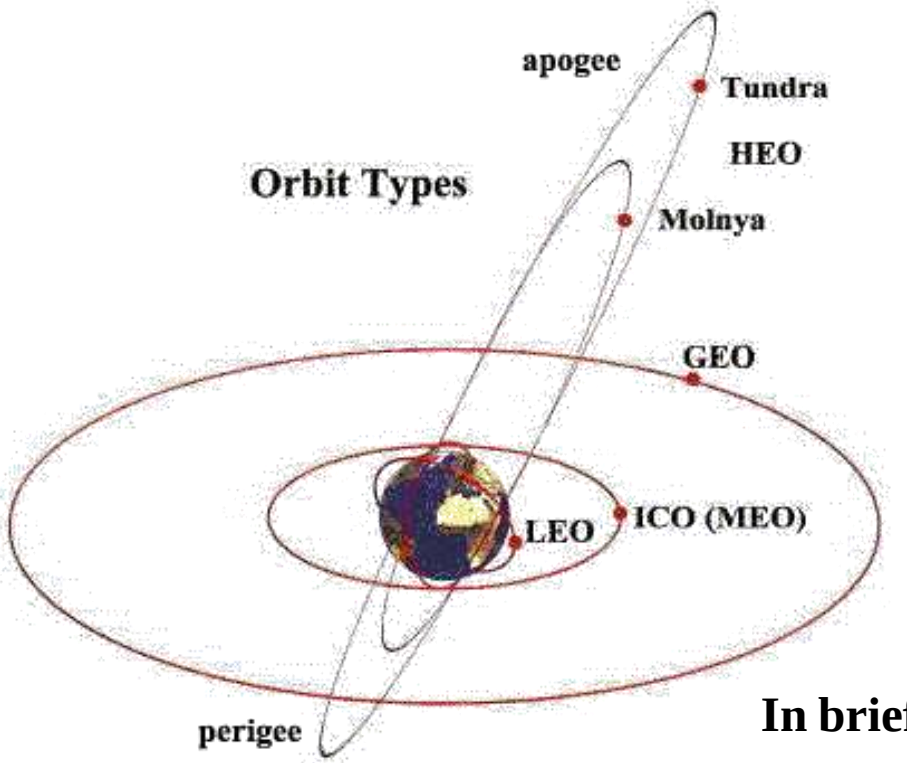
Types of A satellite Orbits Satellite Orbits

- Type of Orbit
  - Circular
  - Elliptical
- Plane of Orbit
  - Equatorial
  - Polar
  - Inclined



In brief

- Altitude of the orbit Geostationary Satellites (GEO)

  Low Earth Orbit (LEO)

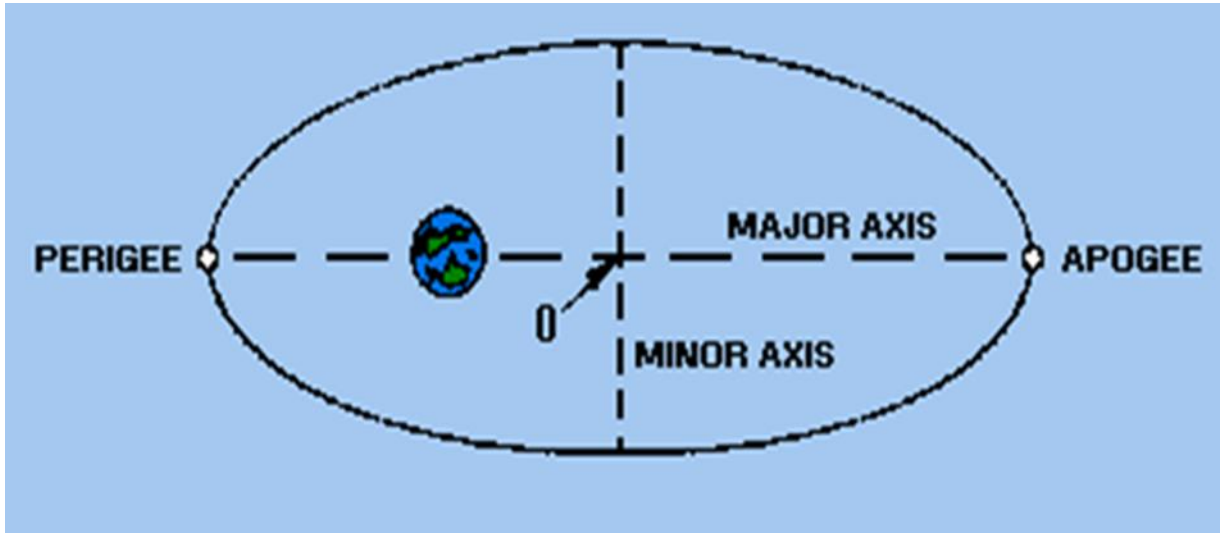
  Medium Earth Orbit (MEO)

Orbit Descriptions

Orbits generally are described according to the:

1. Physical shape of the orbit as shown in fig.:

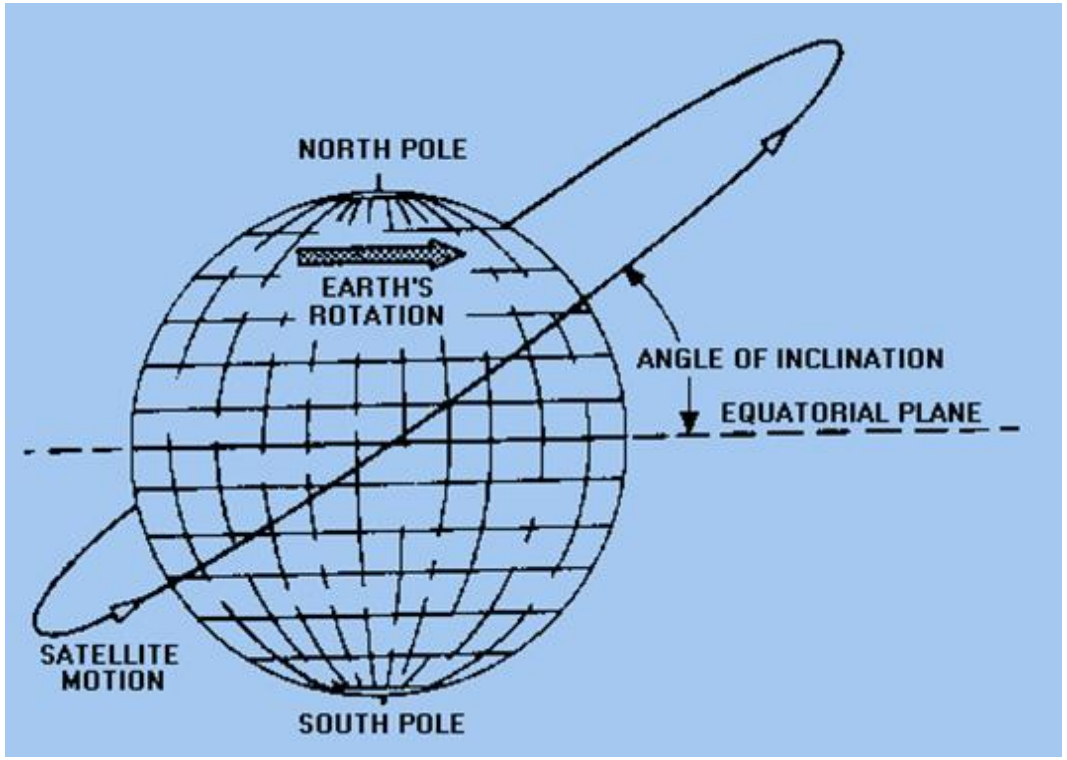
- PERIGEE is the point in the orbit nearest to the center of the earth
- APOGEE is the point in the orbit the greatest distance from the center of the earth



Note: The shape of the orbit is determined by the initial launch parameters and the later deployment techniques used.

2. Angle of inclination of the plane of the orbit as shown in fig.:

It is the angle between the equatorial plane of the earth and the orbital plane of the satellite



The inclination of the orbit determines the area covered by the path of the satellite, as shown in fig. the greater the inclination, the greater the amount of surface area covered by the satellite.

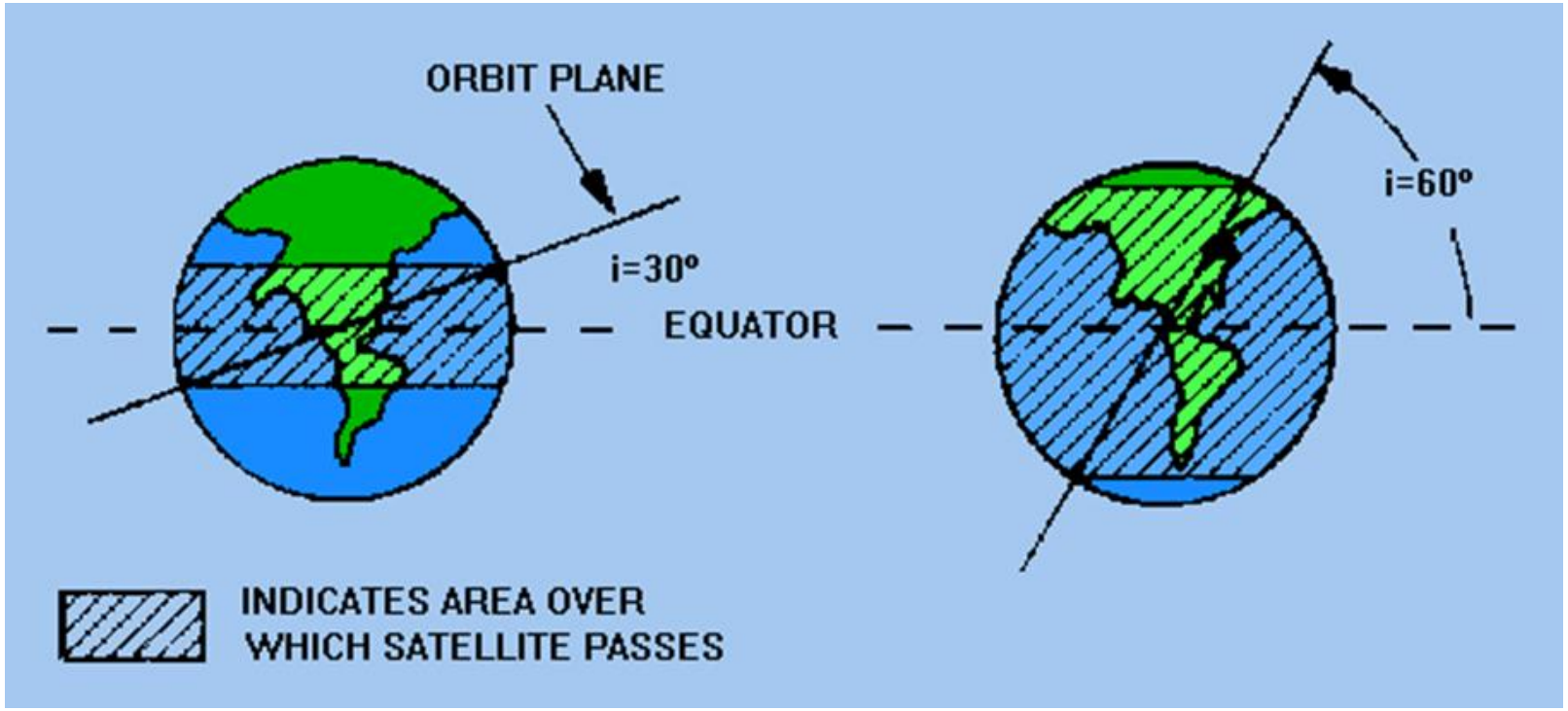
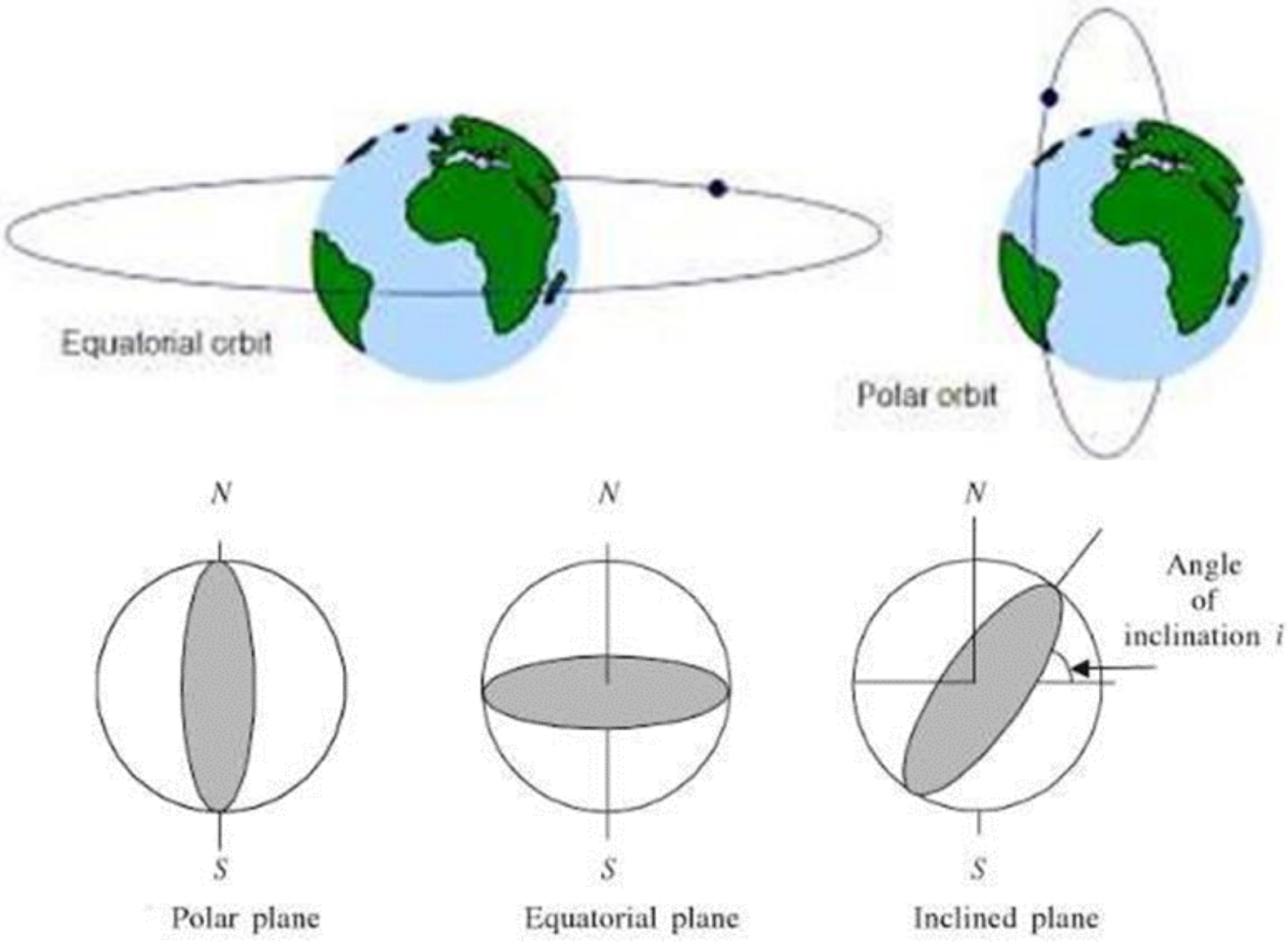


Figure 1-7. - Effect of orbit plane inclination on satellite coverage.

Special Types of Inclined Orbits.



Special Types of Inclined Orbits.

- A satellite orbiting in a plane that coincides with the equatorial plane of the earth is in an *EQUATORIAL ORBIT.*

- A satellite orbiting in an inclined orbit with an angle of inclination of 90 degrees or near 90 degrees is in *a POLAR ORBIT*