

ANALYSIS OF GPS SATELLITE OBSERVABILITY OVER THE INDIAN SOUTHERN REGION

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ABSTRACT

Global Positioning System (GPS) is a satellite based navigation system that provides instantaneous 3D PVT (position, velocity and time) in the common reference system anywhere on or above the earth surface. The position of the GPS receiver is calculated from the satellite orbit positions and the distance between the satellites and the receiver. GPS is implemented on the principle of trilateration - the method of determining position by measuring distances to known coordinates i.e. satellite position and the unknown coordinate i.e. receiver position. The satellite orbit coordinates and pseudo range information of at least four satellites are necessary to compute the receiver position. The GPS receiver position estimation is dependent on the visibility of satellites and the accuracy of the information the signals provide. The accuracy of the estimated receiver position depends on the information acquired from the GPS signals. The satellites at higher elevation are known to provide signals with lesser noise. At any instant of time, four or more satellites may be visible to the user. The receiver may be able to choose satellites that give more accurate signals by knowing the elevation angle. In this paper, the elevation angle and azimuth angle of all the satellites visible during 24 hours duration are computed and visibility is analysed.

KEYWORDS: GPS, Satellite Position, Elevation, Azimuth

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