ISSN: 2469-4134
Journal of Remote Sensing & GIS
OPEN ACCESS Freely available online
Short Communication

Techniques Involved in Signal Propagation of Satellite Receiver

Matthew Patrik*

Department of Geological Sciences, University of Nevada, Reno, USA

DESCRIPTION

A physical propagation model is implemented. It includes both a line of sight component influenced by the ionosphere and troposphere, as well as a surface scattering component influenced by specular and diffuse scattering from the aircraft usage or ship hull. The model accounts for atmospheric dynamics, geometry changes caused by aircraft flight, dynamics of usage elements (such as rotorcraft), time-variation of ground specular point conditions and dynamics of ground contribution. It can simulate the received signal's narrow-band and wide-band components. Ground waves are one method for radio waves to travel from one location to another. When analyzing propagation near the Earth's surface, ground waves are frequently divided into surface waves and space waves. A space wave is made up of the direct wave from transmitter to receiver as well as any reflected wave that reaches the receiver after reflection from the Earth's surface [1,2].

The electrical properties of the Earth have the greatest influence on the surface wave. Surface wave attenuation is high and surface wave propagation is limited to short distances at high frequencies. For frequencies below a few MHz, the surface wave is the most important component of the ground wave for frequencies between 30 and 300 MHz, and for frequencies above 300 MHz, it can be ignored. Satellite Signal Propagation, Impairments and Mitigation addresses satellite link design issues. Every concept from elementary physics is developed in the book [3], beginning with the fundamentals of signal propagation using Maxwell's equations and progressing to the physical causes of impairments. It emphasises the distinct concepts for each involved process based on their physics and explains how they form the determining factors for the related appropriate engineering technique for mitigation. Each fundamental principle is followed by mathematical support and an explanation of the physics behind the equations [4].

CONCLUSION

Channel models for aeronautical mobile satellite communications must address a variety of effects that vary greatly in space, within the coverage area, and over time. In addition to the dynamics of the aircraft and the resulting changes in link geometry and multipath conditions, models must deal with an environment that includes an atmosphere, land and sea surface conditions and topography that changes on very different time scales for each of its components. A physical modelling approach is thus required to comprehend the various contributions and their impact on the radio link. The models are applicable to any satellite link application, including global navigation satellite systems, low Earth orbiting satellite systems and high-altitude platform systems and the results are obtained for a satellite transmitting two linearly polarised signals at 1.625 GHz. It has been discovered that the presence of high-rise buildings adjacent to a street canyon can significantly alter satellite visibility, resulting in an increase in path loss. As a result, ignoring high-rise buildings near a street canyon can result in a path loss difference of up to 30 dB.

REFERENCES

1. Burzigotti P, Ginesi A, Colavolpe G. Advanced receiver design for satellite-based automatic identification system signal detection. Int J Satell Commun. 2012;30(2):52-63.
2. Cuccia C. Direct broadcast satellite receiver synergism with the commercial color TV industry. In 9th Communications Satellite System Conference. 1982; 544.
3. Eaves R, Kolba D. Multiple beam EHF antenna/receiver configuration for unified satellite communications uplink coverage. In 9th Communications Satellite System Conference. 1982; 485.
4. Mrak S, Hrovat A, Vidmar M, Vilhar A. A discrete-components millimeter-wave satellite beacon receiver for Q-band propagation experiment. Int J Satell Commun. 2018;36(4):372-382.

Correspondence to: Matthew Patrik, Department of Geological Sciences, University of Nevada, Reno, USA, E-mail: matthew.p@unr.edu

Received: 03-Oct-2022, Manuscript No.JGRS-22-18852; **Editor assigned:** 05-Oct-2022, Pre QC No. JGRS-22-18852 (PQ); **Reviewed:** 20-Oct-2022, QC No JGRS-22-18852; **Revised:** 25-Oct-2022, Manuscript No. JGRS-22-18852 (R); **Published:** 03-Nov-2022, DOI: 10.35248/2469-4134.22.11.260.

Citation: Patrik M (2022) Techniques Involved in Signal Propagation of Satellite Receiver. J Remote Sens GIS. 11:260.