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TRANSIT OF THE LEO COMMUNICATIONS SATELLITE CONSTELLATION ACROSS THE COMMUNICATION RANGE OF A GEOSTATIONARY ORBIT SATELLITE

Abstract

As of February 26, 2024, there are a total of 5,458 Starlink satellites and 634 OneWeb satellites in Earth orbit. The presence of such large-scale low Earth orbit (LEO) communication satellite constellations can potentially impact geostationary orbit (GEO) telecommunication and broadcasting services. Consequently, the International Telecommunication Union (ITU) has specific regulations concerning the operation of Non-Geostationary Orbit (Non-GSO) satellite networks to ensure they do not cause harmful interference with other satellite systems, including Geostationary Orbit (GSO) satellites. There is many possibility that LEO satellites like Starlink and Oneweb could enter the field of view of Earth station antennas aimed at GEO satellites, and in such cases, the communication signals from the LEO satellites must not interfere with those of the GEO satellites. In this paper, the scope of the Earth station is expanded to include the farthest points of north, south, east, and west of South Korea. Accordingly, this study analyzes how frequently the Starlink and Oneweb satellites in orbit pass through the field of view of Earth station antennas located in all regions of South Korea that receive satellite broadcasting services from the Koreasat 6 satellite positioned at 116 East longitude.