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Assuring a Safe, Secure and Sustainable Environment for Space Activities (4)

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PREVENTION AND MITIGATION OF INTERFERENCE AFFECTING EARTH EXPLORATION
SATELLITE SERVICES (EESS) AND GLOBAL NAVIGATION SATELLITE SYSTEMS (GNSS).

Abstract

The growing use of the radio spectrum by many terrestrial and satellite systems in different services, either sharing the same frequency band or in adjacent bands, coupled with emerging new applications and proliferation of devices, are making the radio-frequency interference (RFI) dynamics more complex and posing new challenges to ensure the success of space missions in an interference-free environment.

Cases of harmful interference reported to the International Telecommunication Union (ITU) and presented to the latest World Radiocommunication Conference (WRC-19) held in October-November 2019 and other international fora, confirmed the need of regulatory and technical mechanisms to prevent interference.

The paper will address the most common cases and nature of interference affecting the GNSS and EESS today and in recent years, how Quality of Service is impacted in the form of total interruption of service or alteration of the information which may lead to wrong measurements of natural phenomenon of our planet, insufficient prevention and preparedness for natural disasters, economic losses as well as inaccurate geolocation and time information leading to potential dangers to safety services.

An overview of the international regulatory framework to prevent interference focusing on GNSS and EESS, and the ITU procedures applicable to resolve the cases of harmful interference will be explained.

The paper will also explore possible mitigation techniques and will conclude on the need of synergistic regulatory and technological solutions, together with the cooperation of all stakeholders involved in these cases, as the most impactful means to ensure that the interference level is kept at a minimum level.