



Towards a Standardized method to quantify the amount of interference in the remote sensing bands

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With the increasing demand for radio frequency spectrum by the telecommunications industry, the frequency allocations for remote sensing are being seriously jeopardized. Many Earth Observation satellites, both passive and active, are reporting occurrences of Radio Frequency Interference (RFI) [1-4]. RFI affecting microwave sensors originate from illegal sources emitting in protected remote sensing bands, from out-of-band emissions by nearby services, or by services emitting legally in shared spectrum allocations.

Quantifying the amount of RFI in each of the bands used by Earth Observation satellites is of critical importance. It is a crucial part in accounting for sources of error in the retrieval of the geophysical parameters, in planning for future missions, and also in determining the technical criteria for compatible radio frequency services at the discussions taking place at the International Telecommunications Union level. However, this information is currently not well measured.

The Frequency Allocation in Remote Sensing technical committee (FARS-TC) from the IEEE Geoscience and Remote Sensing Society (IEEE-GRSS) has triggered the creation of a Working Group that is developing a Standard for the assessment of RFI in these bands. The purpose of the standard is “to define the quantitative assessment of man-made RFI in a given frequency band. Specifically, this standard is intended to be used in RFI impact evaluations and monitoring of frequency bands allocated to space-based remote sensing. The standard will provide a definition of RFI as it relates to space-based remote sensing operations” [5].

The Working Group has come up with a 4-step strategy to make this quantification. Step-1 accounts for the RFI detection by means of different signal processing techniques. Step-2 accumulates the RFI information detected in Step-1 on a World map. Step-3 combines the information from multiple sensors operating at the same frequency band to provide a global perspective. Step-4 uses a grading system to perform the quantification process of the information compiled in Step-3. The Working Group is currently discussing the finer technical details on each of those steps.

The status and expected impact of the standard development will be presented at the conference. This process is still open to anyone interested in the topic through the IEEE Standard Association.

References

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