Passive Microwave Protection: Results of WRC-07 and Future Work Plan

Jean Pla

The microwave passive frequency bands that are essential for the retrieval of physical parameters such as soil moisture, ocean salinity, water vapour content, temperature from the ground up to the atmosphere or Earth’s surface are divided into two categories of frequency bands according to the international regulation (Radio Regulation or RR) and fall within the category of Earth Exploration Satellite Service or EESS (passive). These data are collected through the use of passive radiometers mounted on satellite platforms. Purely exclusive frequency bands are dedicated to passive services only: in those bands, sharing is not possible since “all emissions are prohibited”. Shared frequency bands have the characteristics to have both passive services and active services. The last World Radio Conference took place in November 2007 (WRC-2007) and essential results have been obtained concerning the protection of some passive bands: limits and levels for in band sharing for the shared frequency bands 10.6-10.68 and 36-37 GHz with Fixed and Mobile Service, limits and levels for out of band emissions for exclusive passive frequency bands (1400-1427 MHz, 23.6-24 GHz, 31.3-31.5 GHz and 50.2-50.4 GHz). The paper will explain the main results obtained at the last WRC-07 concerning those frequency bands. The last WRC-2007 conference also provided the agenda for the next WRC-2011. Two items will need to be discussed at the next ITSC Conference. Agenda item 1.8 deals with regulatory issues relative to the fixed service between 71 and 238 GHz. The protection of the passive bands within this frequency range will be addressed. The first frequency band that is under consideration is the 86-92 GHz exclusive band that is widely used by many passive sensors. Technical compatibility activity with nearby actives services are currently on going. However, in addition to this essential activity, it is necessary to answer the following question: if the proposed limits, which are based on international agreed recommendations for the protection of microwave passive sensors, are exceeded, what are the actual consequences in terms of reliability of the weather forecasting, climatology and monitoring of the environment? Preliminary work has been done in some cases, but it will be necessary to draft a precise future workplan, with a focus on some frequency bands, especially for example the 86-92 GHz band which is under consideration within ITU-R. Other frequency bands will also be discussed. Agenda 1.6 will address the passive bands between 275 GHz and 3000 GHz. Space and meteorological agencies are invited to provide all elements concerning their future needs and usage.
about these frequencies. Passive bands need to be reviewed and clearly identified, without any firm allocation.
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