



NASA Remote Sensing Spectrum Management Issues

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Ultra-Wideband Vehicular Radars

- Spearheaded by automotive industry coalition known as SARA to use Short Range Radars (SRR) on automotive vehicles "to save lives"
- Main proponent has been Daimler-Chrysler who maintains that using the 79 GHz vehicular radar band that is already permitted by FCC rules is not feasible (despite the fact that Toyota/Lexus is already using the 79 GHz band)
- FCC boldly took the lead on this and permitted UWB SRRs in the 22-29 GHz band despite evidence that there would be interference to passive sensors operating in the 23.6-24.0 GHz passive sensing band

Ultra-Wideband Vehicular Radars

- Problem is interference into the important 23.6-24.0 GHz H_2O_v band from UWB vehicular radars could approach intolerable interference levels for high traffic densities, high market penetration, and particular look directions
- Subsequent Rulemaking on frequency hopping radars
- Proceedings in Germany, Canada and New Zealand and Australia (current)
- Some differences in Europe (sunset date of 2013) and Australia (to be reviewed ~2010)

FCC Activities

- FCC had planned on issuing a Public Notice on the protection of passive uses of the spectrum
 - Sense of draft PN was slanted towards commercial entities telling the FCC why it would be problematic for them to protect passive uses of spectrum
- FCC plans to issue a Public Notice on WRC-07 Agenda Item 1.20 asking commercial interests what would be the impact of regulating unwanted emissions in certain bands as given in the Government Agencies draft proposal

6-7 GHz band

- Use of the 6-7 GHz band for passive sensing
 - Measurement of sea surface temperature vital to early warning for tsunamis and other natural and weather-related phenomena
 - 6-7 GHz band not allocated nor protected in any way for passive sensing and is badly polluted by RFI from terrestrial and satellite communications systems
 - Look for possible alternative bands such as 4200-4400 MHz which is allocated on a secondary basis for passive sensing and is only shared with radio altimeters on-board aircraft

94 GHz Cloud Profiling Radar

- CLOUDSAT launched in April 2006 – cloud profiling radar operating in the 94.0-94.1 GHz EESS (active) allocation
 - Information on orbital parameters and ephemeris data can be found on the CLOUDSAT web site:
<http://cloudsat.atmos.colostate.edu/>
 - Through agreement with IUCAF, orbital information is also available from the Space Frequency Coordination Group (SFCG) web site:
<http://sfcgonline.org>

CLOUDSAT Characteristics

Nominal Frequency	94 GHz
Pulse Width	3.3 μ sec
PRF	4300 Hz
Minimum Detectable Z	-26 dBZ
Antenna Size	1.95 m
Dynamic Range	70 dB
Integration Time	0.3 sec
Vertical Resolution	500 m
Cross-track Resolution	1.4 km
Along-track Resolution	2.5 km

Possible HF Radar

- There is currently a secondary EESS (active) allocation in the band 432-438 MHz for use in remote sensing of rain forests down to the ground through the vegetation canopy
- NASA is interested in flying a dual-band sensor called the Microwave Observatory of Subsurface and Subcanopy (MOSS) using 1 MHz bandwidth somewhere in the 100-150 MHz frequency band (nominally at 137-138 MHz)