

Project: IEEE P802.15 Working Group for Wireless Specialty Networks (WSN)

Submission Title: Overview of CEPT regulation activities on Radiodetermination applications in the frequency range 116-260 GHz

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Re: N/A

Abstract: The document provides the current status of the work done in the European CEPT SE24 Group on regulation for radar applications in the frequency range 116-260GHz.

Purpose: Information to the Standing Committee THz

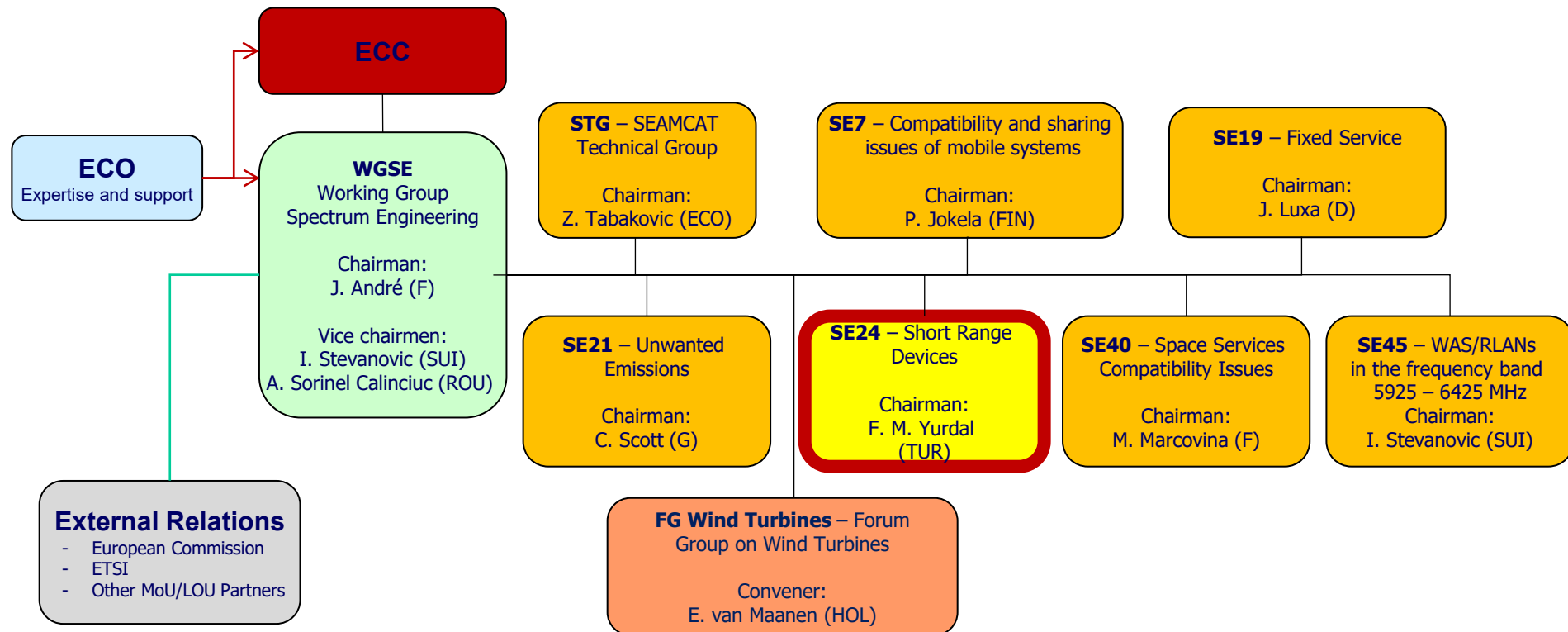
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Introduction

- There is currently no European regulation in place for radars in the frequency range 116-260 GHz
- ETSI TG-UWB provided a document (ETSI TR 103 498)
 - describing sensors in this frequency range, justifying bandwidth requirements
 - requesting CEPT to identify and allocate spectrum for these sensors
- Within CEPT, the Spectrum Engineering (SE) Group 24 is responsible for Short Range Devices (SRD)
- Work Item 71 was defined to process the request

CEPT WGSE Organisation



Source: <https://cept.org/files/10845/WGSE%20organisation%20March%202020.ppt>

Subject & Scope of Work Item 71 (WI71)

- Subject: Radiodetermination applications within the frequency range 116GHz to 260GHz.

Radiodetermination: determination of the position, velocity and/or other characteristics of an object, or the obtaining of information relating to these parameters, by means of the propagation properties of radio waves (acc. to ITU Radio Regulations)

- Scope: To carry out studies for sensor types/scenarios A, B, and C taking into account ETSI TR 103 498.

- Outcome of WI 71: ECC Report

- Triggered by WG FM (Freq. Mngt)

The screenshot displays the ECC Work Programme Database interface. At the top, there is a red header with the ECC logo and a search bar. Below the header, the page title is "ECC Work Programme Database". The main content area is titled "Work Programme Info" and "Work Item details". The details are as follows:

Reference	SE24_71
Short Name	
ETSI Workitem	
ETSI Deliverable	
Subject	Radiodetermination applications within the frequency range 116 GHz to 260 GHz
Related WI	
Scope	To carry out studies for sensor types/ scenarios A, B, and C taking into account ETSI TR 103 498
Deliverable	ECC Report
Responsible group	WG SE - SE24
Start date	25-01-2019
Target date	30-09-2021
Public Consultation	
Regular Work Item	False
Comments	<p>Radiodetermination applications in 116-260 GHz range:</p> <ul style="list-style-type: none"> o The studies should be carried out for sensor types and scenarios A, B, and C taking into account ETSI TR 103 498 o The studies can also include other types of UWB technology based sensors which are not described in ETSI TR 103 498. Such information may be considered based on contributions within the process. One example is automotive radars.

Source: http://eccwp.cept.org/WI_Detail.aspx?wiid=697

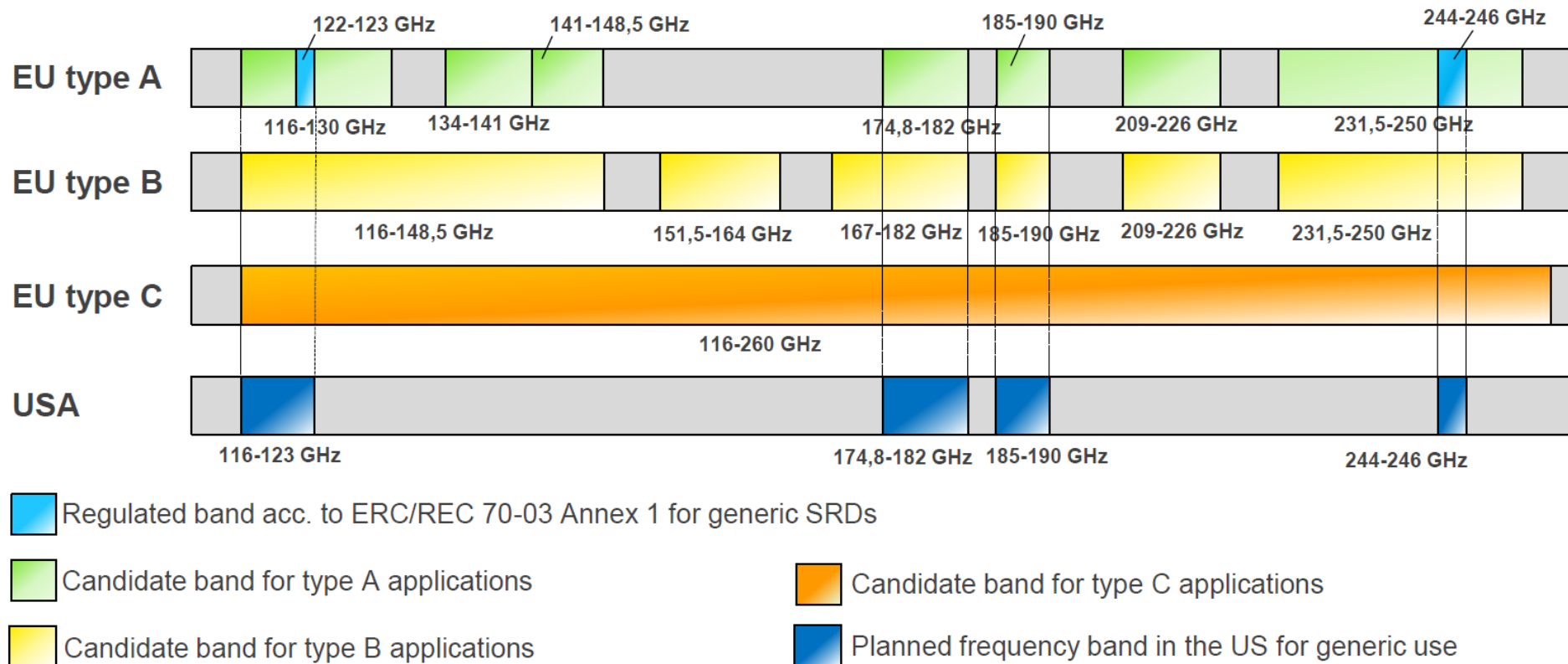
Purpose & Aim of WI 71

- Conduct compatibility study in order to
 - clarify if coexistence between radiodetermination SRDs and incumbent radio services is possible.
 - derive appropriate limits for the SRDs so that they do not interfere with radio services.
- Aim of this compatibility study is to establish a new regulation for the SRDs under consideration and thus to enable their use and sale throughout the EU.

Current Status of WI 71

- In the ETSI TR 103 498 document and in the CEPT SE24 Draft ECC Report, the SRD applications are divided into three categories:
 - Type A: **For open air environments. No limitation in antenna alignment** (e.g. radiodetermination applications for industry automation in open air applications)
 - Type B: **For open air environments. Antenna** main beam direction restricted to **pointing towards the ground** (e.g. level probing radar)
 - Type C: For operation inside **shielded environments** (e.g. tank level probing radar)
- The Draft ECC Report is available - but not yet finalized - consisting of
 - descriptions of the SRD applications under study
 - descriptions of the present victim systems
 - results of deterministic worst case MCL calculations.

Frequency Bands under Consideration



Source: ERM TGUWB #52 – “CEPT SE24 – Status WI 71”

Time Schedule of WI 71

- Target date for the WI 71 ECC Report: April 2021
- The ECC Report is required to be sent to public consultation during the meeting in January 2021 at the latest.

Draft ECC Report

- Executive summary:
 - “This ECC Report considers co-existence of the proposed UWB Radiodetermination applications with various Radiocommunications services operated in the proposed candidate bands in the frequency range from 116 GHz to 260 GHz or in adjacent bands. The description of the considered UWB Radiodetermination devices are contained in ETSI SRdoc TR 103 498 [1] and were communicated to CEPT with an appropriate spectrum request and justification.”

Applications Under Consideration

- Type A (outdoor, no restrictions) :
 - Generic surveillance radar
 - Radiodetermination systems for industry automation (RDI)
 - Traffic surveillance and management for intersections and arterial roads
 - Short range assist and surrounding monitoring for vehicles and autonomous systems
 - Ground Based Synthetic Aperture Radar (GBSAR)
 - In-vehicle or indoor surveillance radar for presence detection and healthcare/medical applications.

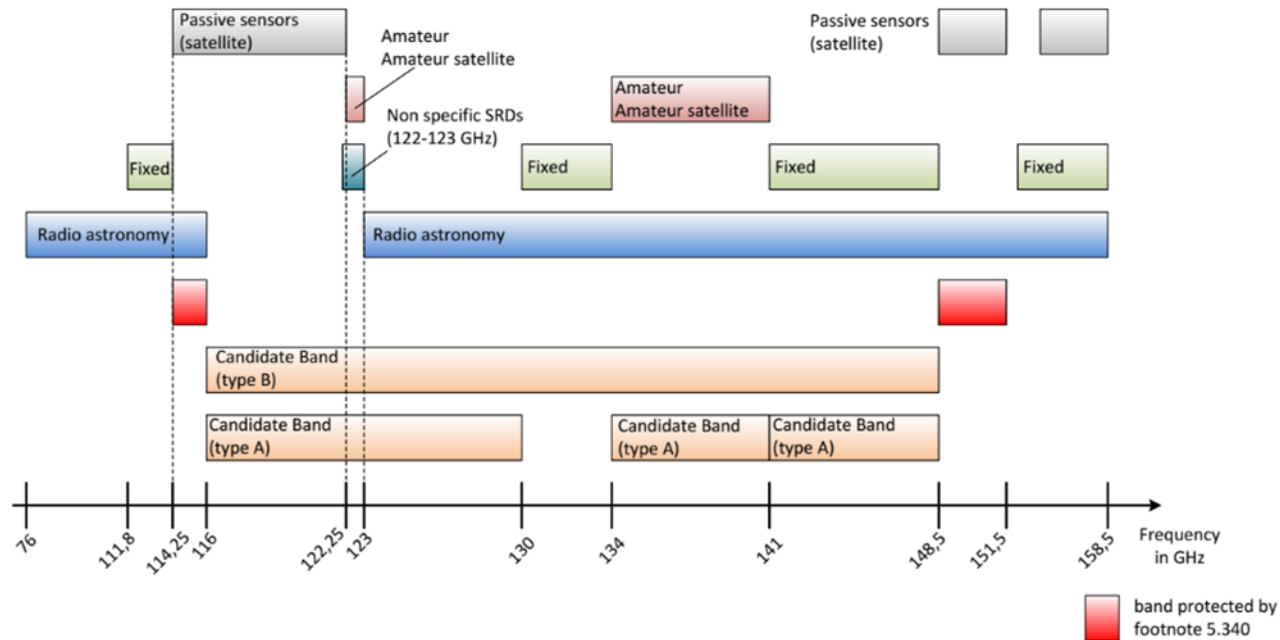
- Type B (outdoor, pointing to the ground):
 - Level Probing Radar (LPR)
 - Contour determination and acquisition radar (CDR)

- Type C (shielded):
 - Tank Level Probing Radar (TLPR)
 - Radiodetermination systems for industry automation in shielded environments (RDI-S)

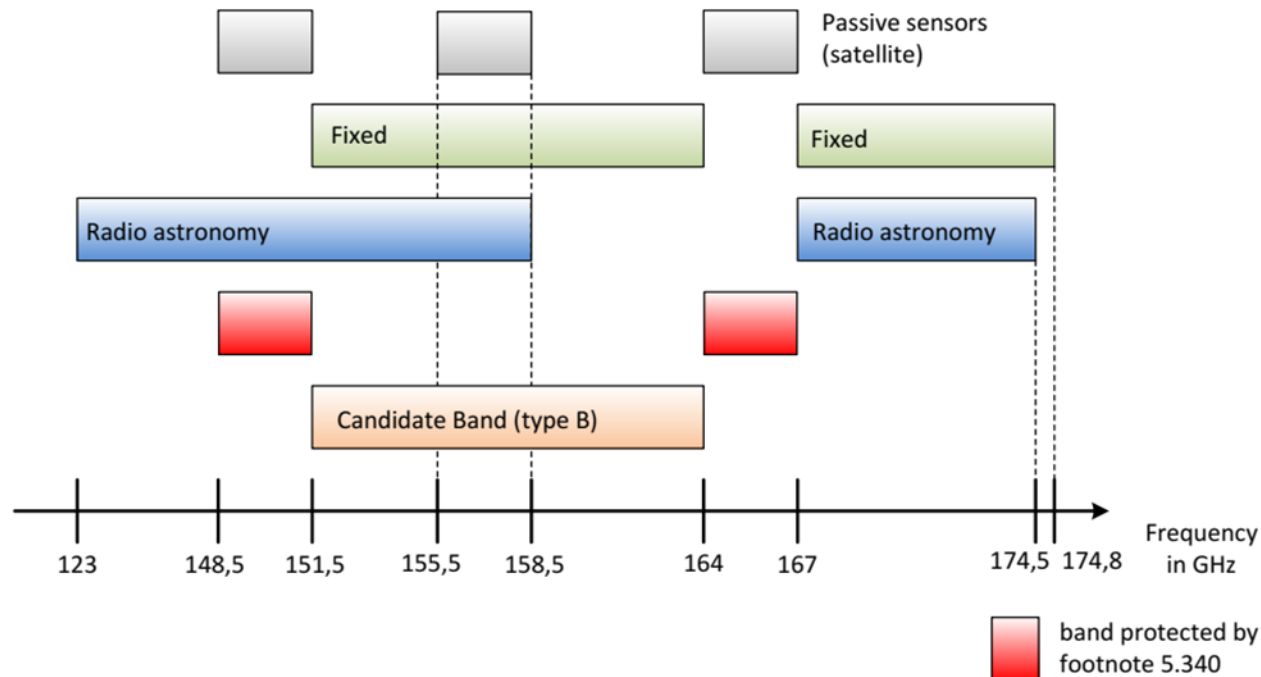
Compatibility Study

- Footnote 5.340 prohibits all emissions in dedicated frequency bands: 114,25–116 GHz, 148,5–151,5 GHz, 164–167 GHz, 182–185 GHz, 190–191,8 GHz, 200–209 GHz, 226–231,5 GHz, 250–252 GHz.
- Footnote 5.149 lists various frequency bands ... advising administrations to take all practicable steps to protect the radio astronomy service from harmful interference: 128,33–128,59 GHz, 129,23–129,49 GHz, 130–134 GHz, 136–148,5 GHz, 151,5–158,5 GHz, 168,59–168,93 GHz, 171,11–171,45 GHz, 172,31–172,65 GHz, 173,52–173,85 GHz, 195,75–196,15 GHz, 209–226 GHz, 241–250 GHz, 252–275 GHz.
- Frequency ranges, allocated to Fixed Service (FS) as a primary service: 130–134 GHz, 141–148,5 GHz, 151,5–164 GHz, 167–174,8 GHz.

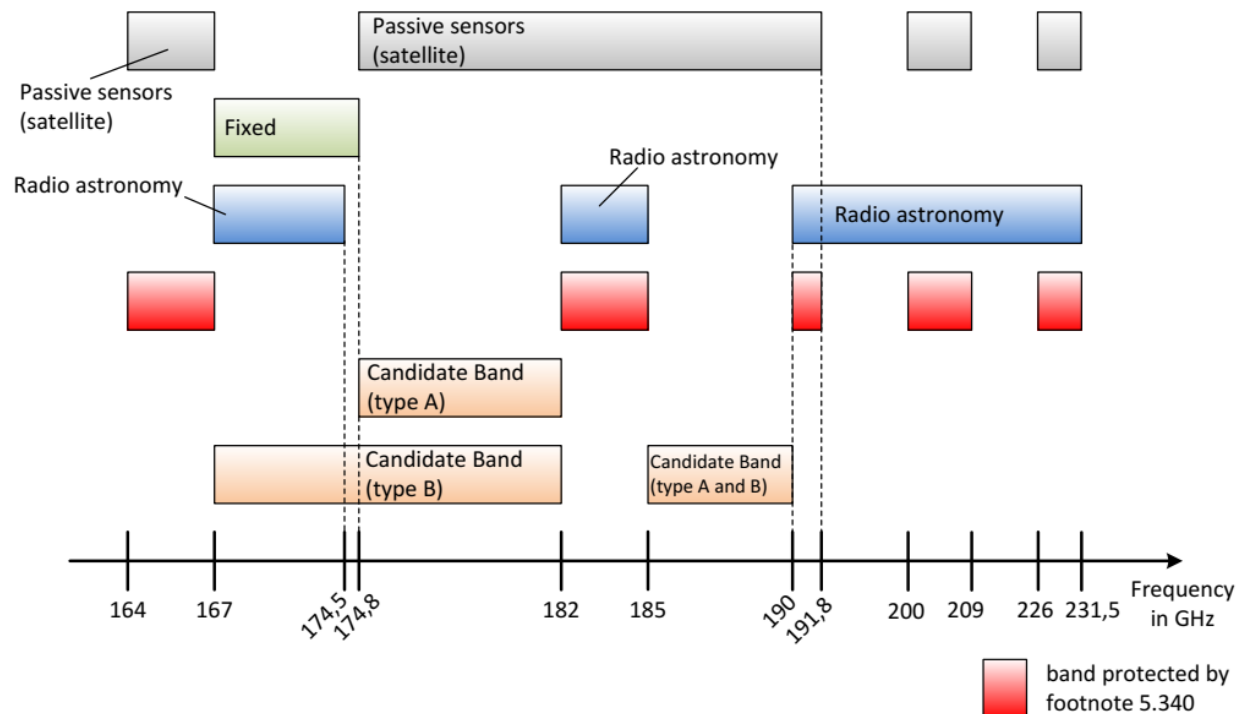
Compatibility scheme for the frequency range 116 to 148.5 GHz



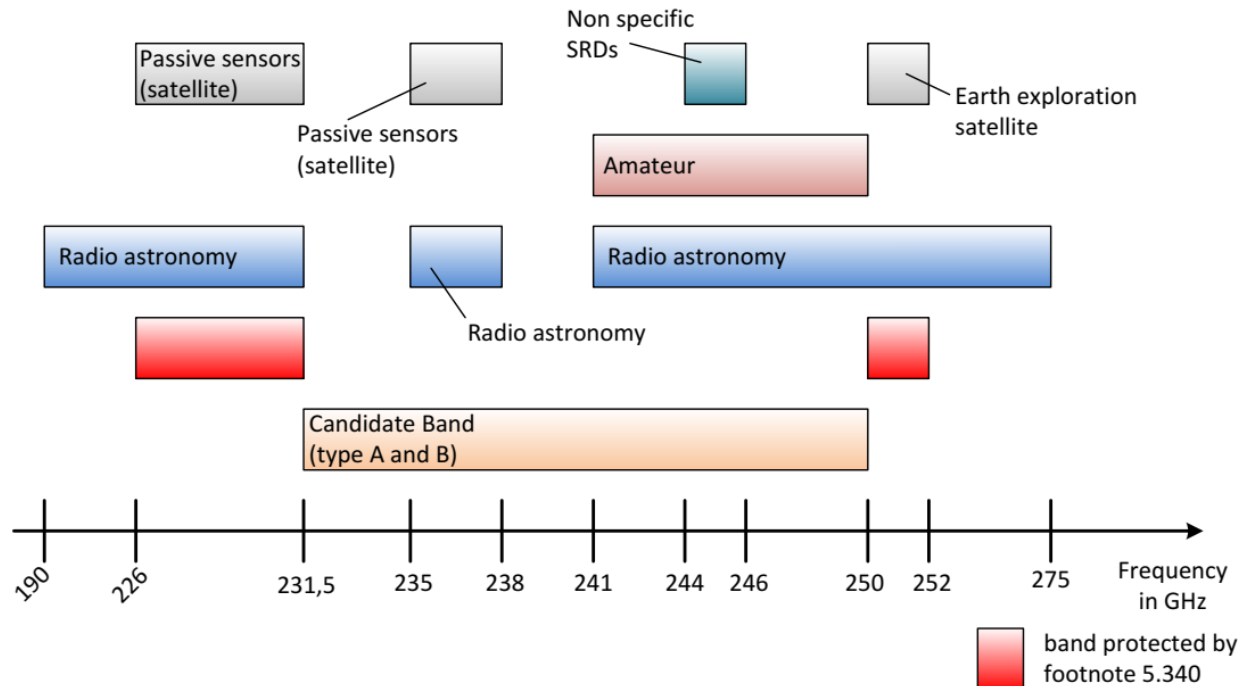
Compatibility scheme for the frequency range 151.5 to 164 GHz



Compatibility scheme for the frequency range 167 to 190 GHz



Compatibility scheme for the frequency range 231.5 to 250 GHz



Conclusions

- Work ongoing to
 - describe the SRD applications under study
 - describe the present victim systems
 - provide sharing and compatibility studies
 - propose mean and peak EIRP, protecting incumbent users
- Currently a lot of discussions going on the admissible peak and mean EIRP.
- Final ECC report WI71 in April 2021
- Final decision not taken in SE24 but rather in ECC WG FM (Frequency Management)

References

- [1] CEPT SE24: <https://www.cept.org/ecc/groups/ecc/wg-se/se-24/client/introduction/>
- [2] ETSI ERM TGUWB doc. “CEPT SE24 – Status WI71”, Michael Fischer
- [3] CEPT SE24 WI71 doc. “Draft ECC Report N. xxx - Radiodetermination applications in the frequency range 116 - 260 GHz”
- [4] ETSI TR 103 498 V1.1.1 (2019-02), ” System Reference document (SRdoc); Short Range Devices (SRD) using Ultra Wide Band (UWB); Transmission characteristics; Technical characteristics for SRD equipment using Ultra Wide Band technology (UWB); Radiodetermination application within the frequency range 120 GHz to 260 GHz”