Report from the event supported by RadioNet

TITLE	*INTERNATIONAL SPECTRUM MANAGEMENT MEETING: CEPT/ECC PT1*
DATE:	*10-14 JUNE, 2019*
LOCATION:	*BILLUND, DENMARK*
MEETING WEBPAGE:	https://www.cept.org/ecc/groups/ecc/ecc-pt1/client/introduction/
HOST INSTITUTE:	*CEPT/ECC (ELECTRONIC COMMUNICATIONS COMMITTEE OF EUROPEAN CONFERENCE OF POSTAL AND TELECOMMUNICATIONS ADMINISTRATIONS)*
RADIONET BENEFICIARY / NO:	*1/MPG*

RadioNet has received funding from the EU's Horizon 2020 research and innovation programme under the grant agreement No 730562

Report:

1. SCIENTIFIC SUMMARY

This was not a scientific meeting. The goal of WP4.2 (spectrum management) is the protection of radio frequency bands allocated to the Radio Astronomy Service. The organizing body, the Electronic Communications Committee of European Conference of Postal and Telecommunications Administrations (CEPT/ECC) is responsible for radio communication regulation in European countries. At this meeting of its Working Group PT1, I, Benjamin Winkel, represented CRAF, the Expert Committee on Radio Astronomy Frequencies (CRAF) of the European Science Foundation, which represents the European radio astronomical community in matters of radio frequency protection at the CEPT. ECC/PT1 is responsible for the development of the mobile communication sector in CEPT countries.

Among the topics, which were discussed, three are of utmost importance to European radio astronomy

1. possible use of 5G mobile/fixed communications network (MFCN) equipment in the 26 GHz band (24.25 - 27 GHz) under a general authorisation regime, i.e. uncoordinated deployment
2. ECC work item (WI) PT1_18, which tasks PT1 to study if MFCN user equipment (UE) could be operated on board drones in one or more of the existing MFCN bands
3. ECC WI PT1_13, which is about a review of ECC Decision (05)05 (2.6 GHz MFCN) to study suitability for an upgrade of the band to 5G technology

In preparation to the meeting, a large amount of work went into the design of suitable compatibility studies that analyze the necessary conditions of co-existence between the radio astronomy service (RAS) and the interfering services (in this case the International Mobile Telecommunication Service, IMT).

2. AGENDA OF THE EVENT

The 62th meeting of ECC PT1 took place in Billund/Denmark between June 10 to June 14, 2019 and CRAF member Benjamin Winkel (BW) participated. As there were many different topics on the agenda, (sub-)working and drafting groups were meeting in up to four parallel sessions. In some cases, BW had to make a choice between two concurrent sessions based on (subjective) prioritization. However, BW kept close contact with members of the German administration to be informed about on-going work in sessions, which he could not attend.

In the following, the three major topics, which were relevant to RAS at this meeting, are discussed in more detail.

MFCN/5G at 26 GHz under general authorization regime

In a letter to the Chairman of the ECC, the European Commission asked the ECC to study the possible use of 26-GHz 5G equipment under a general authorization regime (see document PT1(19)117). Some countries, such as France, submitted input documents to the PT1 #62 with their thoughts about the matter, e.g., which difficulties and potential solutions were identified. From a RAS perspective an uncoordinated use has great dangers, as it would essentially mean that local spectrum agencies or other authorities would have effectively no control over devices that would be operated in immediate vicinity of our telescopes. One potential solution could be a geolocation-based switch in the 5G access points, that wouldn't allow operation in certain areas. However, it seems unlikely that vendors would be willing to implement such functionality, as it would increase the costs. This is also one of the reasons, why vendors and mobile network operators did not support the uncoordinated use of 5G technology at the meeting.

As there is not even an ECC work item for this topic yet, PT1 did not work extensively on the matter, but prepared a statement to ECC with the views of the participants and proposals for the further process.

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Use of MFCN UE on-board aerial vehicles

Work item PT1_18 is about the possible use of existing MFCN bands (mainly) below 5 GHz by aerial vehicles (AV). The topic was brought up by Airbus and Deutsche Telekom, originally asking for allowing "command & control" (C&C) and wireless payload communication of unmanned aerial vehicles (UAV), aka drones, in existing IMT networks. The PT1 sub-working group A decided at previous meetings, which bands are most favorable and restricted the studies in a draft ECC report (document PT1(19)153) to the bands 700, 800, 900, 1800, 2100, 2600, 3400-3800 MHz. The L-band (1427 - 1517 MHz) is downlink-only in CEPT countries and thus of limited use. The 26-GHz band was allocated in CEPT under the constraint that communication from a base station to UE on a drone is not allowed.

While the WI PT1_18 is about UAVs, Airbus is of the view that the studies carried out for the ECC draft report would also apply for manned aircrafts. Therefore, they proposed a liaison statement (LS) to be sent to WGFM, in which the ECC is informed about this and asks for a possible extension of the scope of the WI to include all sorts of aerial vehicles into the WI. As no administration was opposing the proposal, the (slightly rephrased) LS will be send to WGFM.

CRAF had prepared a compatibility study (doc. PT1(19)145) in which the potential impact of MFCN UE on-board AVs is analyzed. Lacking information about estimated future deployment densities, for now only a single-interferer worst-case study was performed. Given the large number of potential bands, CRAF decided to look at three RAS bands, 610, 1420 and 2600 MHz – to serve as examples – and use the general spurious emission limit of -30 dBm/MHz to derive separation distances; which are very large for some cases, especially for typical flight heights of aircrafts (>3000 m).

BW presented the CRAF study in the UAV drafting group. Unfortunately, it was discussed very controversially. In particular Airbus is of the opinion that the study was not appropriate, as the three RAS bands that were chosen are all separated by at least 90 MHz from the closest IMT band. Apparently, it is unclear out to which separation in frequency one is ought to study the impact of possible spurious emissions, and Airbus claimed that "PT1 does not (and never did) study this". Regardless of this, the 3.4 GHz IMT band is not very much separated from the 3.35-GHz RAS band and the second harmonics of the 700 MHz IMT band falls into the passive 1.4 GHz RAS band – CRAF is of the opinion that both of this should at least be looked at in more detail. Another issue was raised by Airbus, that existing drones use WiFi (2.4 GHz) for C&C and, as RAS has no problems with WiFi spurious emissions, the MFCN won't cause trouble, as well. However, BW informed them that it is a wrong assumption that WiFi is not a problem for RAS (it is just difficult to have a handle on the problem, as the 2.4 GHz band is uncoordinated). Due to the limited time, the issues could only briefly be discussed and the session was mostly an exchange of arguments between Airbus and CRAF. Although BW asked for inclusion of the CRAF study into the draft report, the drafting group chair, Thomas Konschak (Deutsche Telekom), simply refused this, as there was no consensus reached (Airbus was against it).

BW raised the topic again in the closing session of the sub-working group A, but again, as no consensus was reached, the Chair (Michael Kraemer) did not follow CRAF's proposal. Only in the final closing plenary, when BW raised the issue a third time, with support from France and Germany the PT1 Chairman decided to add a placeholder section (for RAS compatibility studies) to the draft report.

A newly formed correspondence group is tasked to further study the matter and to solve the open issues in (probably) two web-meetings in July and August before the next PT1 meeting.

MFCN at 2.6 GHz, upgrade from 4G to 5G

In ECC work item PT1_13, a possible update of ECC Decision (05)05 is under study, the aim of which is to analyze if and possibly under what conditions existing 4G MFCN bands could be upgraded to active antenna systems (AAS) equipment (5G). CRAF had carried out and submitted compatibility studies to the previous PT1 meeting (#61). As the new AAS base stations will have out-of-band power levels that are about 14 dB higher than for 4G devices, the necessary coordination zones around RAS stations would be significantly

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larger. Therefore, France proposes to implement a so-called "additional baseline", which demands much stricter limits in the vicinity of radio observatories. The value of 0 dBm/MHz (total radiated power), which is on the table, was however strongly opposed by vendors (e.g., Ericsson and Huawei) and several administrations (e.g., Sweden and UK). The opponents expressed the opinion that such strict limits would technically not be possible and thus the additional baseline would make no sense. At the meeting, no compromise could be found. From the RAS perspective, the stricter limits are more favorable, as it would ease the coordination process (with much smaller coordination zone size), but independent of the outcome of this, the latest ECC decision (05)05 draft includes the protection of the RAS.

3. PARTICIPANTS

The participants at these meetings are all experts in spectrum management, on technical and/or regulatory aspects. Some represent the national spectrum Agencies of the CEPT member countries, others industry involved in either the proposed new mobile broadband applications, or the numerous potential victim services (broadcasting, fixed services, satellite communications, etc.), and others represent accredited scientific organizations such as CRAF (radio astronomy) or ESA (Earth Exploration Science Service).

The attendance list published for this meeting by the ECC/PT1 is not publicly available. I estimate there were about one hundred participants.

No conference picture was posted online by the ECC.

4. RADIONET FINANCIAL CONTRIBUTION

The RadioNet support was used to pay for the attendance of the CRAF member, Benjamin Winkel (nationality: Germany).

5. PUBLICATIONS

This meeting will not result in scientific publications. CRAF's input to CEPT/ECC meetings consists of technical compatibility studies on the protection of the radio astronomy service from other services, technical advice, and contribution to CEPT or ECC texts (recommendations, reports, etc.). The input and output documents are publicly available on the ECC web site.

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