



ECC Decision (22)06

Harmonised technical conditions for Mobile/Fixed
Communications Networks (MFCN) in the band 40.5-43.5
GHz

approved 18 November 2022

EXPLANATORY MEMORANDUM

1 INTRODUCTION

This ECC Decision on harmonised technical conditions for mobile/fixed communications networks (MFCN) in the 40 GHz (40.5-43.5 GHz) band reflects the objective of CEPT to harmonise the 40.5-43.5 GHz band for Europe.

Studies have taken into account the compatibility with and protection of all existing services, including their future deployments, in the same and adjacent frequency bands.

2 BACKGROUND

CEPT recognises the importance of a harmonised frequency arrangement for MFCN and the need of common and minimal least restrictive technical conditions (LRTC) for MFCN in the band 40.5-43.5 GHz, including to ensure protection of other services and applications.

The following principles have been considered to define the MFCN frequency arrangement:

- Facilitating roaming and cross-border coordination to achieve global economies of scale for equipment;
- Use of a 200 MHz block size approach which is in line with the mobile systems foreseen to be used in the 40.5-43.5 GHz band;
- Spectrum efficiency and high level of flexibility in order to adapt to national circumstances as well as to meet the changing need and demand for capacity in time and geography.

The implementation of this ECC Decision will encompass different stages at the national level e.g. update of national frequency allocation table, national studies and consultation processes, and update of existing authorisations for fixed services as required, with a varying complexity depending on the legal and regulatory framework of each country. The harmonised technical conditions for MFCN set out in this Decision have been developed assuming an authorisation regime where the base station locations are known. This Decision includes also additional technical measures to be considered on a national basis for authorisation regimes where the locations of base stations are not known in advance of installation, in order to ensure that the harmonised technical conditions/LRTC (Annex 2) in this Decision are met.

WRC-19 identified the frequency band 40.5-43.5 GHz for IMT on a global basis. In March 2020, CEPT decided to develop a new ECC Decision to harmonise the frequency band 40.5-43.5 GHz for MFCN. The harmonisation measures comprise of a band plan and technical conditions suitable for next generation terrestrial wireless systems, taking into account the applications according to ERC Report 25 (ECA Table) [1].

In the 40.5-43.5 GHz band, MFCN will support mainly urban and suburban hotspot areas. The deployment of MFCN is expected to target only cells with a small range. Due to the characteristics of this frequency band, there is no expectation that it will be used for contiguous wide/nationwide coverage of MFCN networks areas. Almost no MFCN deployment is expected in the 40 GHz band in rural areas and therefore this scenario has not been studied by CEPT. There may be a need for a limited number of hotspots in rural areas. MFCN networks at 40 GHz could be deployed indoor and outdoor.

Based on the harmonised technical conditions included in this ECC Decision, coexistence with the FSS, the FS and RAS in the same band is feasible when considering assumed technical and operational characteristics for terrestrial MFCN and should be managed at national level. Additional national measures may be needed, which do not impact the LRTC.

A review of the current and planned use of the 40.5-43.5 GHz frequency band taking into account the radio applications according to ERC Report 25 (ECA Table) was done and the results of an ECC Questionnaire from 2016 [2] were evaluated. No additional questionnaire was needed as the incumbent services to be protected in preparation for WRC-19 stayed the same i.e.: fixed service (FS), radio astronomy service (RAS) and fixed-satellite service (FSS). Depending on the national situation and according to the assumption for usage of this band in this report, a need was identified to maintain appropriate provisions in MFCN authorisation in

40.5 - 43.5 GHz for protection of fixed links and RAS in the 42.5-43.5 GHz (see CEPT Report 82, section 2.2 [3] the list of identified RAS sites). It should be noted that in some countries there are no fixed links or RAS sites. Moreover, there is also a need in MFCN authorisation to maintain appropriate provisions to ensure, in a proportionate way, the use and the possibility for future deployment of FSS receiving earth stations in the frequency band 40.5-42.5 GHz and FSS transmitting earth stations in the frequency band 42.5-43.5 GHz, while protecting MFCN in 42.5-43.5 GHz.

CEPT developed guidelines to support the introduction of MFCN while ensuring, in a proportionate way, the use of FSS receiving earth stations in the frequency band 40.5-42.5 GHz and the use of FSS transmitting earth stations in the frequency band 42.5-43.5 GHz and the possibility for future deployment of these earth stations (see ECC Recommendation (22)01 [4]). In addition, CEPT developed guidelines on measures to facilitate compatibility between MFCN in 40.5-43.5 GHz and receiving FSS earth stations in 39.5-40.5 GHz to prevent and/or resolve interference issues (see ECC Recommendation (22)02 [5]).

In a number of CEPT countries, fixed Point-to-Point and Point-to-Multipoint links are in operation in the 40.5-43.5 GHz band. The band is also heavily used in many countries to deploy fixed point-to-point backhaul links for cellular networks and governmental usage. Coexistence between fixed links and MFCN in the 40.5-43.5 GHz frequency band will be managed at national level or through bilateral agreements for cross-border coordination and do not impact the harmonised technical conditions as defined in this Decision.

The protection of RAS observations in the 42.5-43.5 GHz band from in-band MFCN transmissions and from unwanted emissions of MFCN in the band 40.5-42.5 GHz will require the implementation of suitable exclusion zones around RAS stations on a case-by-case basis.

A regular assessment of the evolution of MFCN system characteristics, including network deployments, after 3 years, or earlier if needed, will provide additional confidence that these LRTC ensure adequate protection of other services, in particular space services. Furthermore, administrations are invited to monitor and report annually on deployment of 40.5-43.5 GHz MFCN in their country, and are required to rapidly report on cases of interference to FSS caused by MFCN above 40.5 GHz and the measures they have taken to resolve them.

ECC Report 309 [6] and ECC Report 348 [7] analyse usage of aerial UE in current MFCN harmonised bands. No studies have been yet done for the 42 GHz frequency band. Due to its specific characteristics and usage, the 40.5-43.5 GHz MFCN band may not be appropriate for connectivity from base stations to aerial UE. In addition, the connectivity from aerial UE to base stations may have a significant impact, e.g. on separation distance from RAS stations in the band 42.5-43.5 GHz and from receiving FSS earth stations in the band 40.5 - 42.5 GHz, which would require further study.

3 REQUIREMENT FOR AN ECC DECISION

The ECC recognises that implementation of MFCN including IMT-2020/5G systems in CEPT countries providing high data rate applications in the band 40.5-43.5 GHz based on a harmonised frequency arrangement and least restrictive technical conditions will reduce development and implementation costs of manufacturing equipment and will secure future long-term investments by providing economies of scale. A harmonised frequency arrangement will reduce complexity in cross-border coordination. The opportunity to utilise larger channel bandwidths will assist the provision of high data rates.

The ECC recognises that:

- the authorisation regimes are decided at national level in particular in response to market demand;
- for the continuation of the successful market development of MFCN including IMT-2020/5G, the regulatory framework needs to provide the confidence and certainty for industry to make the necessary investment;
- administrations need flexibility to adapt their use of the band 40.5-43.5 GHz to national circumstances due to the current fixed links usage;
- administrations need to maintain the possibility for operation/deployment of existing and future FSS earth stations;
- administrations need to protect RAS sites in 42.5-43.5 GHz from MFCN in that band including from MFCN unwanted emission from MFCN operating below 42.5 GHz;

- where the locations of base stations are not known in advance of installation, there are no identified practical means to protect a RAS site in 42.5-43.5 GHz other than locating new base stations outside of a pre-determined exclusion zone;
- additional measures may need to be considered by administrations on a national basis for protection of RAS, FS, FSS space stations and FSS earth stations to ensure that harmonised technical conditions are met.

The ECC also recognises the need to include relevant technical conditions for MFCN including IMT-2020/5G to ensure protection of the FSS (space-to-Earth) in the frequency band 40.5-42.5 GHz, FSS (Earth-to-space) in the frequency band 42.5-43.5 GHz and RAS (42.5-43.5 GHz) (see ECC Recommendation (22)01) [4].

In addition, ECC Recommendation (22)02 provides “Guidelines on measures to facilitate compatibility between MFCN operating in 40.5-43.5 GHz and FSS earth stations receiving in 39.5-40.5 GHz and to prevent and/or resolve interference issues” [5].

ECC DECISION OF 18 NOVEMBER 2022 ON HARMONISED TECHNICAL CONDITIONS FOR MOBILE/FIXED COMMUNICATIONS NETWORKS (MFCN) IN THE BAND 40.5-43.5 GHZ (ECC DECISION (22)06)

“The European Conference of Postal and Telecommunications Administrations,

considering

- a) that MFCN for the purpose of this Decision includes International Mobile Telecommunications 2020 (IMT-2020) and other mobile and fixed communications networks;
- b) that harmonised least restrictive technical conditions (including a harmonised frequency arrangement) will support the implementation of MFCN in this band and facilitate global roaming, economies of scale and reduce the cost of equipment;
- c) that the use of contiguous blocks of spectrum for MFCN reduces equipment complexity, provides a more efficient use of spectrum and facilitates spectrum access compared to the use of fragmented, non-contiguous blocks of spectrum;
- d) that for a single MFCN network a contiguous block of 800-1000 MHz is desirable to enable the full capabilities of IMT-2020 systems;
- e) that some administrations may wish to implement MFCN in parts of this frequency band on a progressive basis depending on national market demand;
- f) that differences in the market demand for MFCN and different authorisations regimes across CEPT countries is likely to lead to different timescales concerning the introduction of MFCN in the band 40.5-43.5 GHz;
- g) that the block edge mask (BEM) concept has been developed by CEPT to facilitate implementation of spectrum rights of use which are as technology neutral as possible;
- h) that it is beneficial to synchronise MFCN networks operating in the same location (avoid simultaneous uplink and downlink transmissions) since this would increase the efficient usage of spectrum;
- i) that the 40.5-43.5 GHz band will mainly be used for hotspots in urban and suburban areas; however there may be a limited number of hotspots in rural areas; it is not expected that the band will be used for contiguous wide/nationwide coverage of MFCN;
- j) that a regular assessment of the evolution of MFCN system characteristics, including network deployments, after 3 years, or earlier if needed, will provide additional confidence that these LRTC ensure adequate protection of other services, in particular space services;
- k) that a questionnaire to CEPT administrations on deployment of MFCN in the band 40.5-43.5 GHz should be carried out on a regular basis;
- l) that ECC agreed to not develop an additional BEM in order to protect adjacent services based on the assumption that the MFCN Base Station out-of-band limit in the FSS earth station channel of operation is -13 dBm/MHz (4 dBm/(50 MHz)) as a compromise if all the possible configurations of the MFCN and FSS ES channels of operation are considered. It is noted that this assumption does not amend the ETSI standard requirements;
- m) that ECC noted that this assumption is fulfilled by the MFCN BS when complying to the ETSI TS 138 104 [8] (the limits of Table 9.7.4.3.3-2) for a contiguous bandwidth of 200 MHz or below;
- n) that, if the limits from the ETSI harmonised standard were relaxed compared to the assumptions in Annex 2 this may lead to risk of an interference issue;

- o) For terminal stations, adjacent services are expected to be protected by requirements of the ETSI TS 138.101-2 v.17.6.0, Table 6.5.2.1-1, [9];
- p) that the use of this frequency band by the mobile service for MFCN is intended for land mobile service use and sharing studies were conducted based on that assumption;
- q) that WRC-19 also agreed on some other conditions to ensure protection of incumbent services as outlined in Resolution 243 (WRC-19) [10];
- r) that sharing with active services above 40 GHz may be easier than systems operating at lower frequencies since high transmitting directivity can be achieved with antennas of practical size, the atmospheric attenuation is higher and the scattering of signals by the troposphere decreases [11];
- s) that the properties of higher frequency bands, such as shorter wavelength, would better enable the use of advanced antenna systems, including multiple-input and multiple-output (MIMO) and beam-forming techniques, in supporting enhanced broadband;
- t) that the harmonised technical conditions for MFCN set out in this decision have been developed assuming an authorisation regime where the base station locations are known;
- u) that for an authorisation regime where the locations of base stations are not known in advance of installation, implementation of sharing conditions implies the need for information on relative location of/or distance between interferer and victim, or on the location of one of these when planning the location of the other station;
- v) that for an authorisation regime where the location of base stations is not known in advance of installation, there is a need for administrations to assess if it is necessary to impose additional measures (see Annex 3) while still respecting the least restrictive harmonised technical conditions in Annex 2;
- w) that CEPT has developed ECC Recommendation (22)01 [4] which addresses transmitting earth stations in the frequency band 42.5-43.5 GHz and receiving earth stations in the frequency band 40.5-42.5 GHz, for GSO and non-GSO satellite systems;
- x) that CEPT has developed ECC Recommendation (22)02 [5] which addresses receiving FSS earth stations, which (as well as MSS earth stations) are designated for use in the frequency band 39.5-40.5 GHz, for GSO and non-GSO satellite systems, through ERC Decision (00)02 [12];
- y) that CEPT administrations should rapidly report on interference cases on FSS earth stations caused by MFCN above 40.5 GHz and their resolution to the Office;
- z) that sharing studies have shown that FSS space stations in the frequency band 42.5-43.5 GHz would be protected with a margin of more than 16 dB for GSO and 24.3 dB for NGSO, based on agreed assumptions, and it will be necessary to ensure that these services remain protected;
- aa) that for outdoor base stations operating in 42.5-43.5 GHz the pointing elevation of the main beam should normally be below the horizon, and also the mechanical pointing needs to be at or below the horizon;
- bb) that very limited number of MFCN base stations will be communicating with a positive elevation angle towards MFCN indoor mobile stations;
- cc) that outdoor base stations are normally installed below the rooftops in urban/suburban areas, which significantly increases the clutter loss and thus reduces necessary separation distances with respect to stations on the ground of the RAS or FSS (earth stations);
- dd) that coexistence issues between fixed links and MFCN in the 40.5-43.5 GHz frequency band will be managed at national level or through bilateral agreements for cross-border coordination;
- ee) that the protection of current and future RAS stations will require the implementation of suitable exclusion zones around RAS stations on a case-by-case basis;

- ff) that the coverage of outdoor hotspot has been assumed in sharing studies to be achieved with the deployment of base stations communicating with terminals on the ground and a very limited number of indoor terminals with positive elevation, resulting in an elevation of the main beam of outdoor base stations normally below the horizon, thus with high discrimination towards the satellites;
- gg) that ECC Report 309 analyses the usage of aerial UE for communication in current MFCN harmonised frequency bands but has not studied the 40.5-43.5 GHz frequency band. Further studies are required in order to identify relevant technical and operational conditions for the usage of aerial UE in this frequency band;
- hh) that in EU/EFTA countries the radio equipment that is under the scope of this Decision shall comply with the RE Directive [13]. Conformity with the essential requirements of the RE Directive may be demonstrated by compliance with the applicable harmonised European standard(s) or by using the other conformity assessment procedures set out in the RE Directive.

DECIDES

1. that CEPT administrations shall designate the frequency band 40.5-43.5 GHz for MFCN on a non-exclusive basis to Mobile/Fixed Communications Networks (MFCN);
2. that CEPT administrations wishing to introduce MFCN in the band 40.5-43.5 GHz shall apply the frequency arrangement and technical conditions according to Decides 3, 4 and 6;
3. that the MFCN frequency arrangement in the band 40.5-43.5 GHz is Time Division Duplex (TDD) frequency arrangement as provided in Annex 1;
4. that the Least Restrictive Technical Conditions (LRTC) specified in Annex 2 shall apply to the MFCN systems;
5. that this Decision, does not preclude the use of the band by other services to which the band is allocated and administrations should maintain the possibility of existing and future FSS earth stations to operate in the band accordingly;
6. that Administrations should ensure, in compliance with the relevant technical conditions in the Annexes, that the MFCN referred in Decides 1 appropriately protect radio astronomy service in the 42.5-43.5 GHz and receiving earth stations in 40.5-42.5 GHz;
7. that MFCN in the 40.5-43.5 GHz band should not be used for connectivity from base stations to aerial UE and may only be used for connectivity from aerial UE to base stations after completion of coexistence studies that demonstrate compatibility with incumbent services;
8. that administrations wishing to introduce MFCN where the location of base stations is not known in advance of installation, shall consider the additional technical measures on a national basis as provided in Annex 3;
9. that administrations are invited to monitor and report annually to the Office on deployment of MFCN in their country in the band 40.5-43.5 GHz;
10. that administrations should rapidly report on interference cases on FSS earth stations caused by MFCN above 40.5 GHz and their resolution to the Office;
11. that this Decision **enters into force** on 18 November 2022 and should be reviewed 3 years after this date, or earlier if needed;
12. that the preferred **date for implementation** of this Decision shall be 18 May 2023;

13. that CEPT administrations shall communicate the **national measures** implementing this Decision to the ECC Chairman and the Office when this ECC Decision is nationally implemented.”

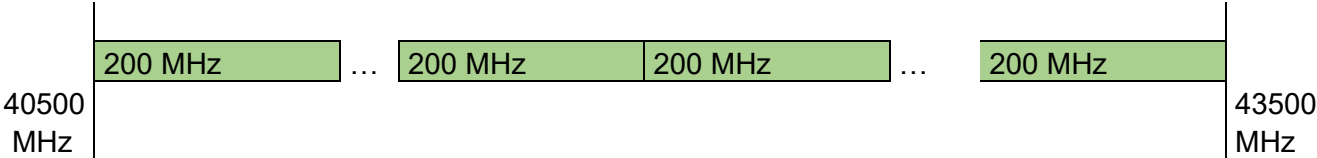
Note:

Please check the Office documentation database <https://www.docdb.cept.org> for the up to date position on the implementation of this and other ECC Decisions.

ANNEX 1: HARMONISED FREQUENCY ARRANGEMENT FOR THE BAND 40.5-43.5 GHZ

- The frequency arrangement is a TDD arrangement with a block size of 200 MHz;
- This block size could be adjusted to narrower blocks (multiples of 50 MHz) adjacent to other users, to allow full use of spectrum, if required.

Figure 1: Example of possible frequency arrangements for MFCN in the 40.5-43.5 GHz band



ANNEX 2: LEAST RESTRICTIVE TECHNICAL CONDITIONS (LRTC) FOR THE MFCN SYSTEMS

The technical conditions presented in this annex have been developed assuming an authorisation regime where the base station locations of transmitters and receivers are known. These conditions include provisions related to the coexistence between MFCN systems in the form of a block edge mask (BEM), i.e. related to spectrum licensing and the avoidance of interference between users of spectrum. Additional considerations may be needed on a national basis for an authorisation regime where the location of base stations is not known to ensure that the harmonised technical conditions in this Decision are met (see Annex 3).

A BEM is an emission mask that is defined, as a function of frequency, relative to the edge of a block of spectrum that is licensed to an operator. It consists of components which specify the permitted emission levels in adjacent blocks (transitional region 0-50 MHz below or above operator block) and non-adjacent blocks in the band.

The technical conditions derived below for the frequency range 40.5-43.5 GHz are optimised for, but not limited to, fixed/mobile communications networks (two-way). The BEM for BSs have been developed to ensure coexistence with other MFCN blocks, as well as other services and applications in adjacent bands. Additional measures may be required at national level to achieve coexistence with other services and applications.

A2.1 BASE STATION

The MFCN Base Station (BS) BEM consists of a baseline level, designed to protect the spectrum of other MFCN operators using the band 40.5-43.5 GHz and transitional levels for coexistence between MFCN networks in adjacent blocks. Adjacent services are expected to be protected by requirements of the ETSI TS 138 104, v17.6.0, table 9.7.4.3.3-2 [8].

Table 1 contains the different elements of the BS BEM and Table 2 and Table 3 contain the power limits for the different BEM elements.

To obtain a BS BEM for a specific block the BEM elements that are defined in Table 1, are used as follows:

- Transitional regions are determined, and corresponding power limits are used;
- For remaining spectrum assigned to MFCN, baseline power limits are used.

Operators of mobile/fixed communications networks (MFCN) in the 40.5-43.5 GHz band may agree, on a bilateral or multilateral basis, less stringent technical parameters provided that they continue to comply with the technical and regulatory conditions applicable for the protection of other services, applications or networks and with their cross-border obligations. Administrations should ensure that these less stringent technical parameters can be used, if agreed among all concerned parties.

Table 1: MFCN BS BEM elements

BEM element	Definition
Baseline	Applies in spectrum used for MFCN, except from the operator block in question and corresponding transitional regions.
Transitional region	These are the regions adjacent to an operator block.

For Table 2 and Table 3 synchronised operation is assumed.

Table 2: MFCN BS transitional region requirements for coexistence between MFCN networks operating in adjacent blocks (assuming synchronised operation, see note 1) in the 40.5-43.5 GHz band

Frequency range	Maximum Total Radiated Power (TRP)	Measurement Bandwidth
0-50 MHz below or above operator block	12 dBm	50 MHz
Note 1: Administrations may define appropriate mitigation measures to be applied in case of unsynchronised or semi-synchronised operations – see ECC Report 307 [14]		

Table 3: MFCN BS baseline requirements for coexistence with MFCN networks in other blocks in the band (assuming synchronised operation, see note 1)

Frequency range	Protected frequency range	Maximum Total Radiated Power (TRP)	Measurement bandwidth
In-band baseline	40.5-43.5 GHz	4 dBm	50 MHz
Note 1: Administrations may define appropriate mitigation measures to be applied in case of unsynchronised or semi-synchronised operations – see ECC Report 307 [14]			

Table 4: Conditions applying to the pointing of the main beam of 5G AAS outdoor base stations in the 42.5-43.5 GHz band

Requirement on pointing of the main beam of 5G AAS outdoor base stations
When deploying outdoor base stations, it shall be ensured that each antenna is normally transmitting only with main beam pointing below the horizon and in addition the antenna shall have mechanical pointing below the horizon except when the base station is only receiving

This requirement in Table 4 refers to the elevation of the main beam of 5G AAS outdoor base stations to ensure coexistence with space station receivers.

ANNEX 3: ADDITIONAL MEASURES TO BE CONSIDERED ON A NATIONAL BASIS WHEN THE LOCATION OF MFCN BASE STATIONS ARE NOT KNOWN

Depending on the authorisation regime applied in this band, there is a need for administrations to assess if it is necessary to impose additional measures while still respecting the harmonised technical conditions included in Annex 2.

The harmonised technical conditions for MFCN with assumption that location of base station is known are set out in Annex 2. Additional considerations are provided in this Annex for an authorisation regime where the locations of base stations are not known in advance of installation to ensure compatibility with other services. It should be noted that implementation of sharing conditions implies the need for information on relative location of/ or distance between the interferer and victim, or on the location of one of these in order to apply the sharing conditions, such as separation distances/zones, when planning the location of the other station.

A3.1 FIXED SERVICE IN THE BAND 40.5-43.5 GHZ

National coordination might be needed to manage the incumbent FS while introducing MFCN systems in the 40.5-43.5 GHz band depending upon the authorisation regime. Various approaches or a combination thereof could be considered to manage co-channel or adjacent channel coexistence between MFCN and FS at 40 GHz, e.g. separation in distance, separation in frequency, separation in angle, depending upon line-of-sight and local clutter attenuation.

Such national coordination between fixed services and MFCN is only manageable:

- where the location of MFCN BS is known;
- or where coordination of exclusion zones around existing FS are available and required to be respected by the authorisation regime for MFCN.

It is expected that there is only a low risk of interference to fixed link services from indoor MFCNs. However, the impact to fixed links may need to be analysed on a national basis.

A3.2 RADIO ASTRONOMY SITES

Protection of RAS can be achieved through the calculation of a geographical separation distance, and the determination of exclusion zones around RAS stations, which are defined on national level.

A mechanism, such as, a regulatory requirement to respect exclusion zones defined and applied on a national basis (taking into account terrain, clutter etc) would be needed in order to ensure protection of the RAS site. No technical mechanism to prevent interference has been identified for the MFCN equipment during the drafting of the CEPT Report [3], other than locating new base stations outside of a pre-determined exclusion zone.

A3.3 EARTH STATIONS (FSS) IN THE BAND 40.5-42.5 GHZ AND 42.5-43.5 GHZ

Coexistence can be achieved through the calculation of a geographical separation distance, and the determination of coordination zones that can be applied around the stations of these other services, where further consideration may be needed if MFCN base stations were inside these zones.

A3.3.1 Receiving earth Stations (FSS) in the band 40.5-42.5 GHz

Appropriate measures for ensuring the coexistence with FSS earth stations are needed. The following options could be considered:

- Sharing solutions might be possible, such as the use of a database¹ and/or associated regulatory requirements to ensure that the coordination zones are respected, so that MFCN base stations are not

¹ E.g. a record of locations or geolocation database allowing Dynamic Spectrum Access

deployed within the coordination zones of FSS earth stations, otherwise other mitigations may need to be applied. It is noted that technical solutions to support implementation of geolocation are emerging for e.g. dynamic spectrum access. However, no studies or proposals have been submitted in support of this mode to access to spectrum;

- Assuming there are relatively few FSS ESs, a geographical and/or pointing restrictions could be applied to the MFCN license conditions. In case that MFCN are to be deployed within the coordination zones, a site-specific feasibility calculation/clearance should be performed and for this the location of the MFCN is required.

ECC Recommendation (22)01 provides guidelines to support the introduction of MFCN in 40.5-43.5 GHz while ensuring, in a proportionate way, the use of FSS receiving earth stations in the frequency band 40.5-42.5 GHz and the possibility for future deployment of these earth stations [4]. This addresses GSO and non-GSO satellite systems.

A3.3.2 Transmitting earth stations (FSS) in the band 42.5-43.5 GHz

The potential interference from FSS transmitting earth stations to MFCN in the band 42.5-43.5 GHz should be taken into account.

It is expected that there is a low risk of interference from transmitting FSS earth stations to indoor MFCN base stations.

Appropriate measure for ensuring the coexistence with FSS earth stations are needed. The following options could be considered:

- Sharing solutions might be possible, such as the use of a database to guide the installation of MFCN base stations to be outside any pre-defined coordination zones of FSS earth stations, and/or to apply mitigations if to be deployed within the coordination zone;
- In the case of deployment of additional FSS ES sharing may be possible by national mechanisms to define an additional pre-defined coordination zone, or by requiring an individual site specific feasibility demonstration to show no possibility of interference for additional FSS ES outside a pre-defined coordination zone.

ECC Recommendation (22)01 provides guidelines to support the introduction of MFCN in 40.5-43.5 GHz while ensuring, in a proportionate way, the use of FSS transmitting earth stations in the frequency band 42.5-43.5 GHz and the possibility for future deployment of these earth stations [4].

A3.4 SATELLITE RECEIVERS (FSS) IN THE BAND 42.5-43.5 GHZ

Where there is no means to monitor the evolution of MFCN density and its deployment characteristics, an in-band limit for the TRP for MFCN equipment could be defined.

This could compensate the uncertainty related to the deployment density and to the effective implementation of the antenna pointing restriction, as well as the impossibility for reviewing precisely the effective deployment characteristics and their impact on the interference level to satellites.

A3.5 RECEIVING EARTH STATIONS (FSS/MSS) IN THE BAND 39.5-40.5 GHZ

CEPT developed ECC Recommendation (22)02 which provides guidelines on measures to facilitate compatibility between MFCN operating in 40.5-43.5 GHz and FSS earth stations receiving in 39.5-40.5 GHz and to prevent and/or resolve interference issues [5]. Various approaches or a combination thereof could be considered to manage adjacent channel coexistence between MFCN and FSS at 40 GHz, e.g. separation in distance, separation in frequency, separation in angle and depending upon line of sight and local clutter attenuation.

ANNEX 4: LIST OF REFERENCES

- [1] [ERC Report 025](#): “The European Table of Frequency Allocations and Applications in the frequency range 8.3 kHz to 3000 GHz (ECA Table)”, approved June 1994 and latest amended October 2021
- [2] [ECC PT1\(16\)099 rev1](#): “Results of AI 1.13 Questionnaire”, ECO, September 2016
- [3] [CEPT Report 82](#): “Report from CEPT to the European Commission in response to the Mandate “to develop least restrictive harmonised technical conditions suitable for next-generation (5G) terrestrial wireless systems for priority frequency bands above 24 GHz”
Harmonised least restrictive technical conditions for the 40.5-43.5 GHz frequency band”
- [4] [ECC Recommendation \(22\)01](#): “Guidelines to support the introduction of MFCN in 40.5-43.5 GHz while ensuring, in a proportionate way, the use of FSS receiving earth stations in the frequency band 40.5-42.5 GHz and the use of FSS transmitting earth stations in the frequency band 42.5-43.5 GHz and the possibility for future deployment of these earth stations”
- [5] [ECC Recommendation \(22\)02](#): “Guidelines on measures to facilitate compatibility between MFCN operating in 40.5-43.5 GHz and FSS earth stations receiving in 39.5-40.5 GHz and to prevent and/or resolve interference issues”
- [6] [ECC Report 309](#): “Analysis of the usage of aerial UEs for communication in current MFCN harmonised bands”, approved July 2020
- [7] [ECC Report 348](#): “Usage of aerial UE in 1.8 GHz, 2 GHz and 2.6 GHz frequency bands with MFCN AAS base stations”
- [8] ETSI TS 138 104 V17.6.0: “NR: Base Station (BS) radio transmission and reception”
- [9] ETSI TS 138 101-2 V17.6.0: “User Equipment (UE) radio transmission and reception; Part 2: Range 2 Standalone”
- [10] ITU Radio Regulations, Edition of 2020
- [11] ITU-R: “[Annex 5 to Task Group 5/1 Chairman’s Report: Sharing and Compatibility Studies of IMT Systems in the 37-43.5 GHz Frequency Range](#)”, October 2018
- [12] [ERC Decision \(00\)02](#): “ERC Decision of 27 March 2000 on use of the band 37.5-39.5 GHz by the fixed service and by earth stations of the fixed-satellite service (space-to-Earth) and use of the band 39.5-40.5 GHz by earth stations of the fixed-satellite service and the mobile-satellite service (space-to-Earth)”, amended March 2022
- [13] Directive 2014/53/EU of the European Parliament and of the Council of 16 April 2014 on the harmonisation of the laws of the Member States relating to the making available on the market of radio equipment and repealing Directive 1999/5/EC
- [14] [ECC Report 307](#): “Toolbox for the most appropriate synchronisation regulatory framework including coexistence of MFCN in 24.25-27.5 GHz in unsynchronised and semi-synchronised mode”, approved March 2020