EBU

OPERATING EUROVISION AND EURORADIO

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EBU's reply to Ofcom's consultation: 'Invitation to tender for frequency blocks for the national provision of mobile telecommunications services in Switzerland', March 2018

The European Broadcasting Union (EBU) is very pleased to have the opportunity to provide comments towards Ofcom's consultation: 'Invitation to tender for frequency blocks for the national provision of mobile telecommunications services in Switzerland'.

The EBU represents 73 public service broadcasters in 56 countries in Europe, the Middle East and North Africa. Our Members operate almost 2,000 television and radio channels together with numerous online platforms. Together they reach audience of more than one billion people around the world, broadcasting in more than 120 languages.

The EBU operates EUROVISION and EURORADIO services. EUROVISION is the premier distributor of sports and news content for the world's top broadcast and media platforms. The EUROVISION network is the largest network in the world directly connected to broadcasters which combines satellite and fibre in a global network. In 2016, the network carried more than 75,000 transmissions representing more than 97,000 hours of viewing.

The EBU acknowledges the Federal Communications Commission (ComCom) decision to put out to tender the new frequency blocks. EBU seeks clarification related to the technical conditions of use of the frequency band 3500 – 3800 MHz and the methodology used to determine such rules.

1. Information about the consultation participant

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2. Introduction

In EBU's reply to Ofcom's consultation 'Consultation publique concernant la mise au concours et l'attribution de nouvelles fréquences de téléphonie mobile en Suisse', EBU described the extensive use of the 3.4 – 3.8 and 3.8 - 4.2 GHz bands by EUROVISION (see Appendix 1).

Given the crucial role of the C-Band for the EUROVISION satellite network with one of its main teleports located in Leuk, Switzerland, and with its headquarters in Geneva-Grand Saconnex, the EBU urges Ofcom to undertake all necessary steps to ensure protection of the satellite services in both locations from interference from IMT services in the 3.4-3.8 GHz band.

EBU closely read the consultation document 'Invitation to tender for frequency blocks for the national provision of mobile telecommunications services in Switzerland'. EUROVISION is pleased to know that Ofcom will protect Leuk E/S avoiding any IMT transmission in the 3640 – 3800 MHz band within a protection zone in Valais (area defined by a polygon) which includes Leuk E/S.

However, the protection of E/S against interference should not only consider the 3.4-3.8 GHz band but it should be extended to the higher part of the C-band, the 3.8 – 4.2 GHz band. This portion of band is also highly used by EUROVISION and it could suffer from adjacent channel interference from the use of the 3.5 – 3.8 GHz band by IMT. Included in the following paragraphs are specific questions seeking clarifications on the approach and the methodology used by Ofcom to calculate the specific permitted interference values. This relates to section 2.3.4 of Ofcom's document.

3. Questions

Question #1: Regarding the protection of FSS from MFCN, Ofcom seems to have taken Approach A defined in ECC Report 254. Under this approach the regulator specifies the maximum permitted interference powers (or electric field strengths) at the FSS receivers and allows full flexibility to the MFCN operators to comply with the specified limits. It is also under the MFCN responsibility to perform the calculations to determine the MFCN deployment restrictions needed to fulfil the requirements associated with the protection of other services. The EBU would like to know how Ofcom will verify the compliance of the MFCN networks with the limits and what will happen in case of harmful interference to FSS services despite the compliance with the specified limits. The EBU would like to stress that in case of additional mitigation techniques needed to ensure protection of FSS, the costs should be borne by the MFCN licensees and not by the incumbent services.

Question # 2: In section 2.3.4.1 Ofcom states that *'In Switzerland, however, no new stations are being commissioned in this frequency range'*. Does this sentence means that in Switzerland no new E/S licences will be provided in the frequency range 3.5 – 3.8 GHz? EUROVISION currently operates Leuk E/S with a licence per transponder. Since the satellite operator could change transponder allocation at any time, it's crucial for EUROVISION business to keep the flexibility to obtain new Ofcom licences as soon as the satellite operator changes the frequency allocation within this band. Furthermore, given the importance of our broadcast organization worldwide and the huge long term investments made and planned in our global network, it's also very important that any new E/S commissioned in Geneva in this frequency band could obtain an Ofcom licence and be protected in the long term from any terrestrial network interference.

Question #3: For the protection of Leuk E/S, section 2.3.4.1 states that "*In the remaining 3500 – 3640 MHz frequency range only the restrictions for protection of the SES from blocking apply (P1, see below)."* Is there a minimum distance between a new MFCN operating in the 3500 - 3640 MHz and Leuk E/S? Annex 6 of ECC Report 254 'Operational guidelines for spectrum sharing to support the implementation of the current ECC framework in the 3600 - 3800 MHz range' recommends administrations to use protection distances between MFCN operating in the 3600 – 3800 MHz band and any FSS earth station in the 3400 - 4200 MHz frequency band to avoid LNA/LNB overload effect.

Question #4: Around Geneva-Grand Saconnex a protection zone has not been defined yet. It is crucial that Geneva E/S is also protected from any terrestrial network interference by defining an exclusion zone. The EVC, based in Geneva, is the main coordination and monitoring point of the Eurovision network and is equipped with several antennas. With regards to the C-Band, EVC is currently monitoring NSS-806 services (downlink frequency 3743 MHz) by using a 3.7m dish antenna pointed at 47.5° West. Furthermore, EVC makes use of a 2.4m antenna pointed to Arabsat-5C at 20° East to get access to the Multimedia Exchange Network Over Satellite (MENOS), downlink frequency 4117.8 MHz. The latter E/S is operated under Licence Ref. 1000347396.

Question #5: Table 3 provides "*the maximum irradiation values for the individual satellite earth stations*". "*Mobile radio transmitters in the reception range of the earth stations may not*

exceed the power levels P1 indicated in the following table for protection from blocking/overloading and P2 for protection from co-channel interference". The table provides different P1 and P2 values in function of the location and the height above sea level of the satellite earth station to be protected.

5.1 How the *"reception range"* is defined?

5.2 Should the above sentence use the verb *"must not"* rather than *"may not"*? "Must not" would be aligned with the French version of the document.

5.3 Are P1 and P2 maximum permitted levels of the total aggregated interference from the MFCN at the input of the satellite earth station receiver?

5.4 In case P1 and P2 are maximum permitted levels of the total aggregated interference from the MFCN at the input of the satellite earth station, should the values be identical for any satellite earth station, independently of the transmitter location? With such approach the total received interference must not exceed a pre-defined interference budget regardless of the distance and power of the interferer

5.5 What are the interference criteria and the propagation model used to calculate the values P1 and P2? Has any specific terrain propagation model been used? Has any ECC or ITU-R Report or Recommendation been used to calculate those specific values?

Question #6: How Ofcom is going to manage the fact that CEPT is currently revising ECC decisions and various reports concerning the 3400 - 3800 MHz band?

Question #7: The paragraph/section "Frequency utilisation at the boundary of the polygon, internal co-ordination case" is not clear to EBU.

7.1 Can Ofcom rephrase/clarify the sentence "*At the boundary of the polygon, a domestic coordination case applies because the national one applies to the reduced assignment, which does not necessarily overlap?"*

7.2 Can Ofcom rephrase/clarify the sentence *"This concerns in particular the licensees which have been assigned frequencies in the upper range of the frequency band*". Would this section apply to the 3640-3800 MHz range only? In that case, how this section would relate with the P2 values for Leuk given in Table 3?

7.3 Can Ofcom clarify which conditions should respect a new IMT base station at the border of the polygon? Would the values for TDD synchronised networks between neighbouring countries apply? What is the mean field strength level (dBµV/m/5 MHz) produced by a base station at the border of the polygon? And at a distance of 6 km outside the polygon?

7.4 Please note a typo in the 2.3.4.2.2 section: for TDD synchronised operations, the field strength levels seems wrong. Correct values are µV/m and not V/m.

Appendix 1

28/07/2017

EBU's reply to Ofcom's consultation: *'Consultation publique concernant la mise au concours et l'attribution de nouvelles fréquences de téléphonie mobile en Suisse'*, June 2017

The European Broadcasting Union (EBU) is very pleased to have the opportunity to contribute towards Ofcom's consultation: *'Consultation publique concernant la mise au concours et l'attribution de nouvelles fréquences de téléphonie mobile en Suisse'*.

The EBU represents 73 public service broadcasters in 56 countries in Europe, the Middle East and North Africa. Our Members operate almost 2,000 television and radio channels together with numerous online platforms. Together they reach audience of more than one billion people around the world, broadcasting in more than 120 languages.

The EBU operates EUROVISION and EURORADIO services. EUROVISION is the premier distributor of sports and news content for the world's top broadcast and media platforms. The EUROVISION network is the largest network in the world directly connected to broadcasters which combines satellite and fibre in a global network. In 2016, the network carried more than 75,000 transmissions representing more than 97,000 hours of viewing.

The public consultation relates to the 700 MHz, 1400 MHz, 3.4-3.8 GHz and 2600 MHz bands. The EBU provides comments and concerns related to EUROVISION's use of the 3.4-3.8 GHz band under review by Ofcom and its adjacent band 3.8-4.2 GHz.

1. Information about the consultation participant

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2. The 3.4-3.8 GHz band

2.1 Use of the band by EUROVISION

The EUROVISION satellite network makes an extensive use of the 3.4-3.8 GHz band, in particular for all coverage in Asia/Africa/America.

The 3.6-3.8 GHz band is currently used to provide services over Americas via two satellites: NSS-806, located at 47.5° West, operated by SES, and IS-34, located at 55.5° West, operated by Intelsat.

- On NSS-806, EUROVISION has a full time lease of a 72 MHz transponder; the uplink centre frequency is 5968 MHz and the downlink centre frequency is 3743 MHz. The downlink coverage is shown in Annex 1.

  Uplinks are usually from Leuk, Switzerland, Signalhorn teleport, or from Manassas, SES teleport close to Washington, but also from flyaway antennas or SNGs in America, depending on the event requirements.

  Additionally, EUROVISION leases some other transponders on NSS-806 on an occasional use basis, which are also in the downlink band 3.4-3.8 GHz.

  Signals are usually received by American broadcasters, and monitored in Leuk, Switzerland. Nevertheless, it is worth noting that downlink in Europe can be used to turnaround some events, therefore NSS-806 downlink over Leuk is not used only for monitoring purposes.

  Downlink signals are also monitored in Geneva headquarters through a 3.7 m antenna.

- On IS-34, EUROVISION has a full time lease of a 72 MHz transponder; the uplink centre frequency is 5970 MHz and the downlink centre frequency is 3746 MHz. The downlink coverage is shown in Annex 2.

  This transponder is used to broadcast the HyperMux5 (HM5), which is a permanent multiplex containing different services for American customers.

  The uplink of HM5 is from Leuk, Switzerland, Signalhorn teleport, or from Lario, a Telespazio teleport in Northern Italy.

  Additionally, Eurovision leases some other transponders on IS-34 on an occasional use basis, which may be in the downlink band 3.4-3.8 GHz.

  Signals are usually received by American broadcasters, and monitored in Leuk, Switzerland. Nevertheless, it is worth noting that downlink in Europe can be used to turnaround some events, therefore IS-34 downlink over Leuk is not used only for monitoring purposes.

Other C-Band services are occasionally downlinked in Leuk. As an example, Yamal 202 (a Gazprom satellite) in C-band is going to be used for the FIFA World Cup in Russia in 2018. Feeds for the Confederation Cup 2017 in Russia were provided in the 3.8 – 4.2 GHz band, but the FIFA World Cup 2018 signals could be delivered by using transponders in lower part of the spectrum, i.e. within the 3.6-3.8 GHz.

2.2 Use of the adjacent band 3.8-4.2 GHz by EUROVISION

The C-band is also used to provide services over Asia, through the satellite Apstar-7, located at 76.5° East, operated by Apstar. On Apstar-7, EUROVISION has a full time lease of a 36 MHz transponder; the uplink centre frequency is 6205MHz and the downlink centre frequency is 3980 MHz. The downlink coverage is shown in Annex 3. Uplinks are from Emek Haela, Israel, MX1 teleport, or from Taipo, an Apstar teleport close in Hong Kong, but also from

flyaway antennas or SNGs in Asia, depending on the event requirements. Signals are monitored from Leuk teleport.

In addition to the above networks, EUROVISION uses the C-Band on Arabsat-5C, located at 20° East, for the Multimedia Exchange Network Over Satellite (MENOS). MENOS is a networking concept used to exchange multimedia content over satellite. All the exchange material transmits through a central hub station, which also provides permanent two-way satellite IP connectivity among all the remote stations. MENOS is deployed over the Middle-East, North Africa and Europe in partnership with the Arab State Broadcasting Union (ASBU) and the Arab Satellite Telecommunication Organization Arabsat (the downlink coverage is shown in Annex 4). In order to get access to MENOS, EUROVISION makes use of a Skyware antenna (2.4m) installed at the headquarters in Geneva, operated under the Ofcom Licence Ref. 1000347396: carrier bandwidth is 7.28 MHz, uplink frequency is 6352.11 MHz and downlink frequency is 4117.8 MHz.

2.3 The EUROVISION teleport in Leuk, Switzerland

Signalhorn teleport located in Leuk, Switzerland (46°19′N 7°38′E) has a key role in the EUROVISION network.

The teleport delivers to EUROVISION global satellite communication solutions, as uplinks of permanent multiplexers, ad-hoc transmissions for specific news and sport events, turnarounds of video services.

Furthermore, Leuk teleport allows EUROVISION to monitor several services transmitted through the satellite network.

On top of that, Leuk Teleport acts as a backup network for the EUROVISION control centre: it is the most advanced such facility within the EUROVISION Network, and functions as a safety net in the event of disruption.

With regards to the C-Band EUROVISION downlink services, Leuk teleport makes available several dishes: NSS-806 at 47.5° West is received on LEK-9 (7.3m), IS-34 55.5º West on LEK-5 (16m) and Apstar-7 76.5° East is received by a 7.3 m antenna.

2.4 The EUROVISION headquarters in Geneva, Switzerland

The EVC is the main coordination and monitoring point of the Eurovision Network and is based in Geneva, Switzerland (46°13′N 6°07′E). The EVC is equipped to fully manage from end to end any transmission in the network. It is the first escalation point in case of technical problems affecting the service.

EVC monitoring is equipped with several antennas. With regards to the C-Band, EVC is currently monitoring NSS-806 services by using a 3.7m dish antenna pointed at 47.5° West. Also EVC makes use of a 2.4 m antenna pointed to Arabsat-5C at 20° East to get access to the MENOS network to exchange multimedia content over the satellite.

2.5 EBU views regarding the use of the 3.4-3.8 GHz band by IMT

Given the crucial role of the C-Band for the EUROVISION satellite network with one of its main teleports located in Leuk, Switzerland, and with its headquarters in Geneva, the EBU urges Ofcom to undertake all necessary steps to ensure protection of the satellite services in both locations from interference from IMT services in the 3.4-3.8 GHz band.

Before the start of IMT operations in the 3.4-3.8 GHz band, field trials are needed to investigate potential interference and identify which mitigation techniques need to be put in place around Leuk and Geneva to ensure an interference free operation of the band.

ECC Decision (11)06 'Harmonised frequency arrangements for mobile/fixed communications networks (MFCN) operating in the bands 3400-3600 MHz and 3600-3800 MHz' provides least restrictive conditions, in the form of block-edge-mask for different power levels in order to allow coexistence between MFCN applications. The technical conditions were prepared in 2011 and revised in 2014 and were derived for IMT applications available at the time. Currently, the CEPT is reviewing the harmonised technical conditions with a view to their suitability for 5G terrestrial wireless systems and amend these, if necessary. The final report is expected by June 2018 and should be the starting point when performing interference measurements.

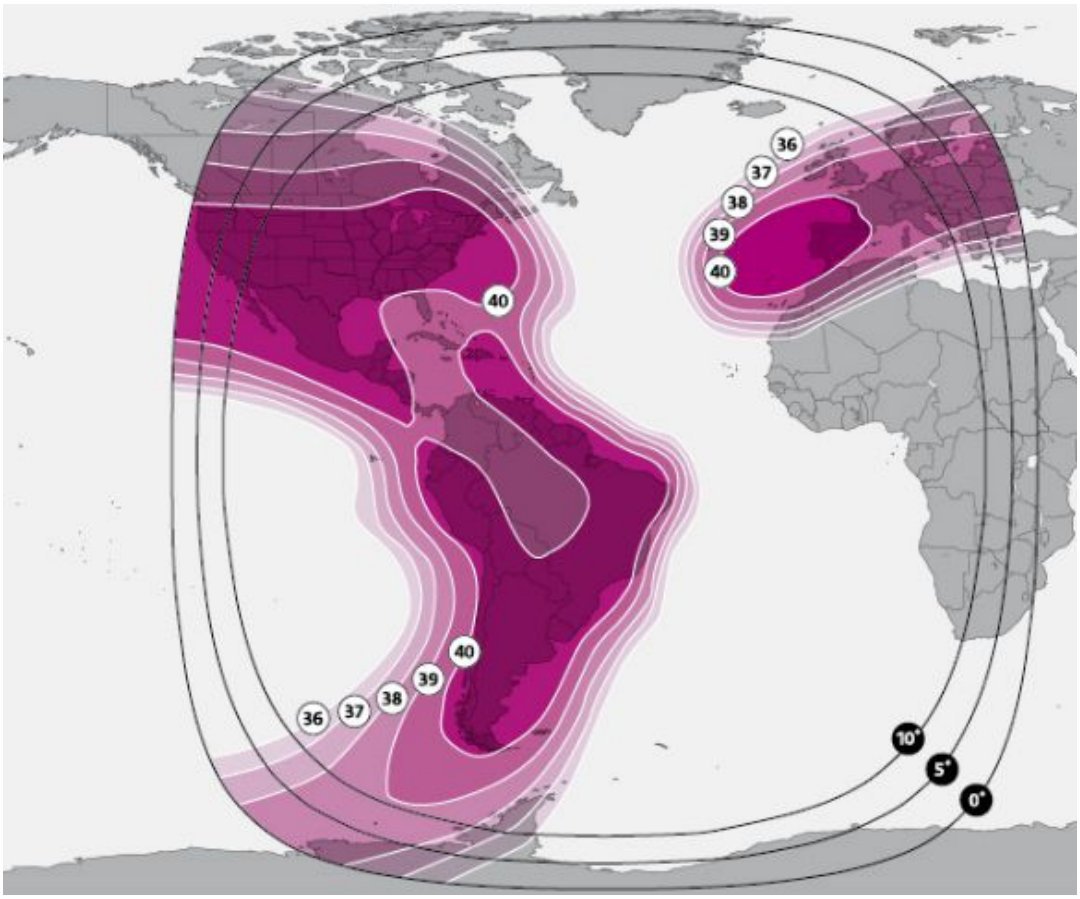
The interference analysis should not only be done within the 3.4-3.8 GHz band but it should be extended to the higher part of the C-Band, the 3.8-4.2 GHz band. This portion of the band is also highly used by EUROVISION and it could suffer from adjacent channel interference from the use of the 3.4-3.8 GHz band by IMT services.

EBU would also like to note that the costs of the implementation of any mitigation technique that might be required to avoid harmful interference to incumbent satellite services in Leuk and in Geneva should be covered by the future new user of the C-Band.

The EUROVISION services and its staff remain available to join Ofcom in their interference analysis prior to the start of any IMT operation in the 3.4-3.8 GHz band.

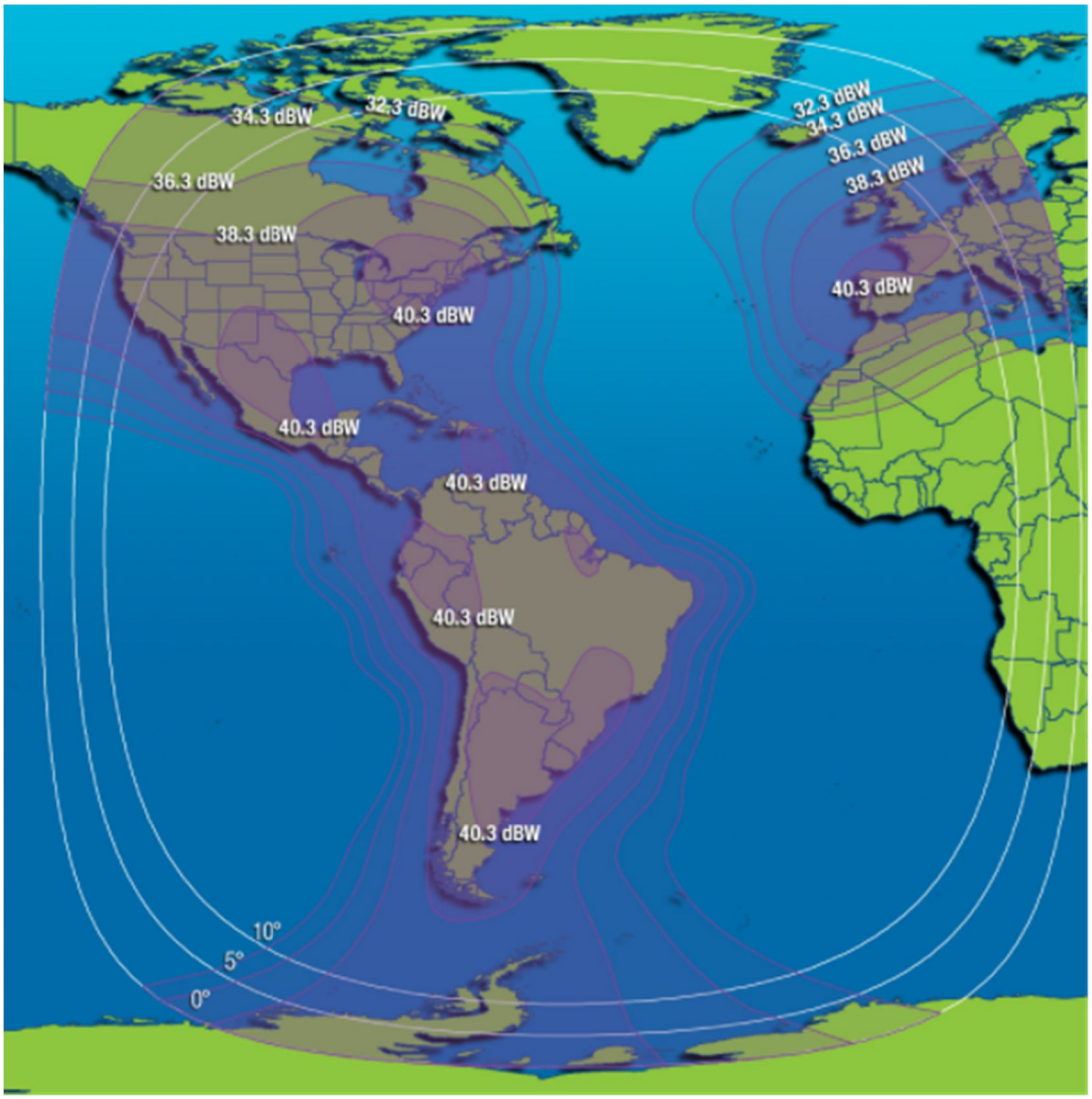
ANNEX 1

NSS-806 at 47.5° West: 3.4-3.8 GHz downlink coverage



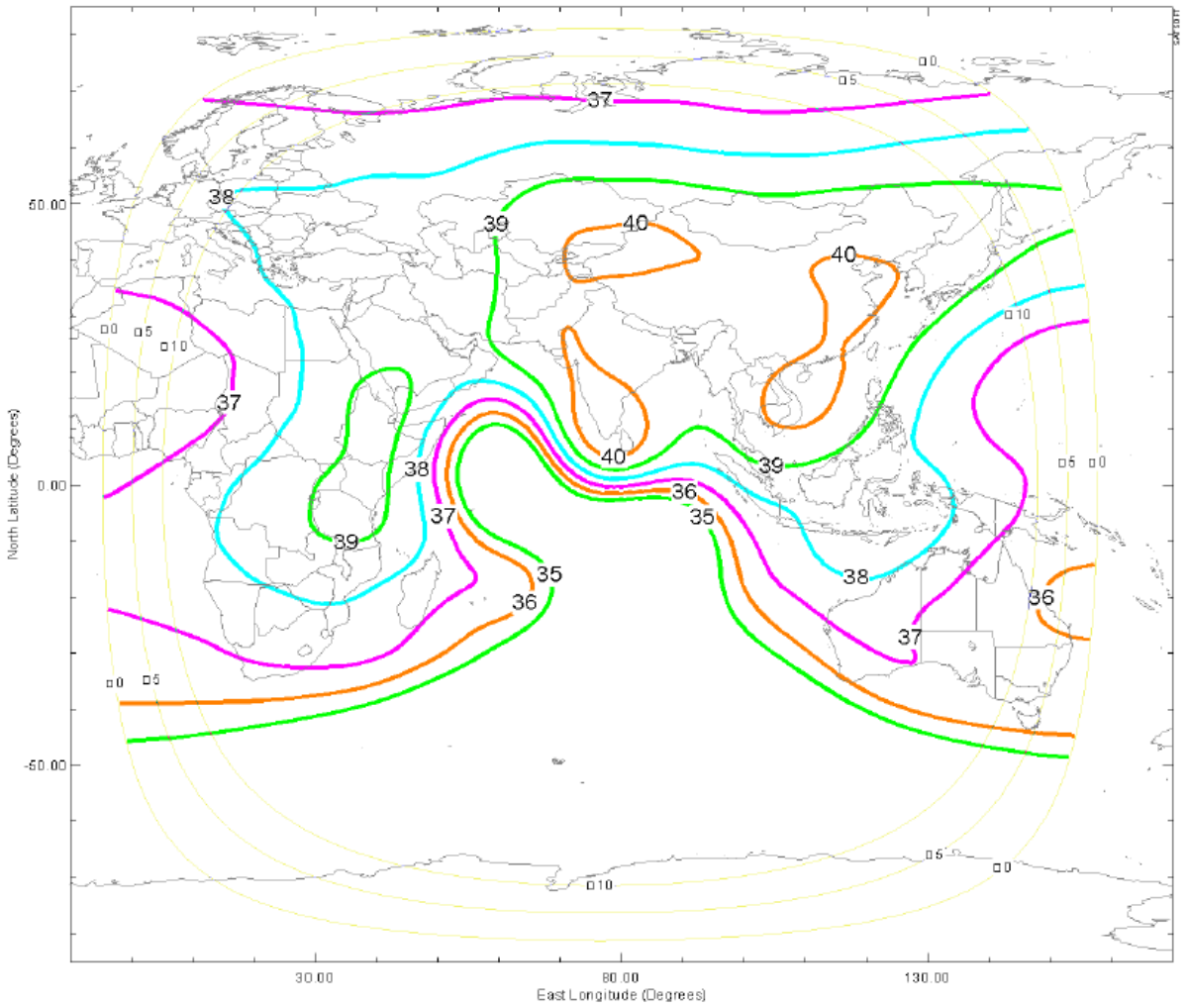
ANNEX 2

IS-34 at 55.5° West: 3.4-3.8 GHz downlink coverage



ANNEX 3

APSTAR-7 at 76.5° East: 3.8-4.2 GHz downlink coverage



ANNEX 4

ARABSAT 5C at 20° East: 3.8-4.2 GHz downlink coverage