

ITU TRAINING ON SPECTRUM MANAGEMENT FOR TERRESTRIAL
SERVICES

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Coordination and notification of terrestrial services

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Outline of presentation

- Frequency coordination
 - Types and methods
 - Coordination in bands shared between terrestrial and space services
 - Coordination examples
- Examination of frequency assignments
 - Regulatory examination
 - Coordination examination
 - Conformity to Plan examination

Purposes and levels of coordination

- Purposes of frequency coordination:
 - operation of stations without interference -> ensuring quality of service to customers
 - assistance in planning of frequencies: how your plans may affect or may be affected by your neighbour
- Levels of coordination
 - Coordination **between operators** (e.g. MOB in 900 MHz)
 - Coordination **between administrations**
- Technical basis for coordination:
 - RR, ITU-R Recommendations, documents of regional organizations

Types and steps of coordination

- Two types of coordination:
 - **Mandatory**: procedures and criteria are in the Radio Regulations (Article 9, Appendixes 4, 5, 7, 8)
 - **Voluntary**: directly between countries, e.g.: in border areas
- Main steps of coordination
 - Identifying need for coordination(affected countries), often using assumed characteristics and worst case conditions
 - Detailed coordination, using real parameters and terrain
- Normally coordination should be completed before bringing a station into operation

Mandatory international coordination

- Coordination in **shared bands** (between terrestrial and space services)
 - RR9.16/9.18: terrestrial stations vis-a-vis individual earth stations
 - RR9.19: terrestrial stations vis-a-vis typical BSS stations
- Coordination under **RR9.21**
 - when requirement to seek agreement is included in a footnote to Table of Frequency Allocations (no cases of **RR9.21** for SEY)
- Coordination under different **regional agreements** (to put new stations or modify existing in planned bands)

Coordination in shared bands

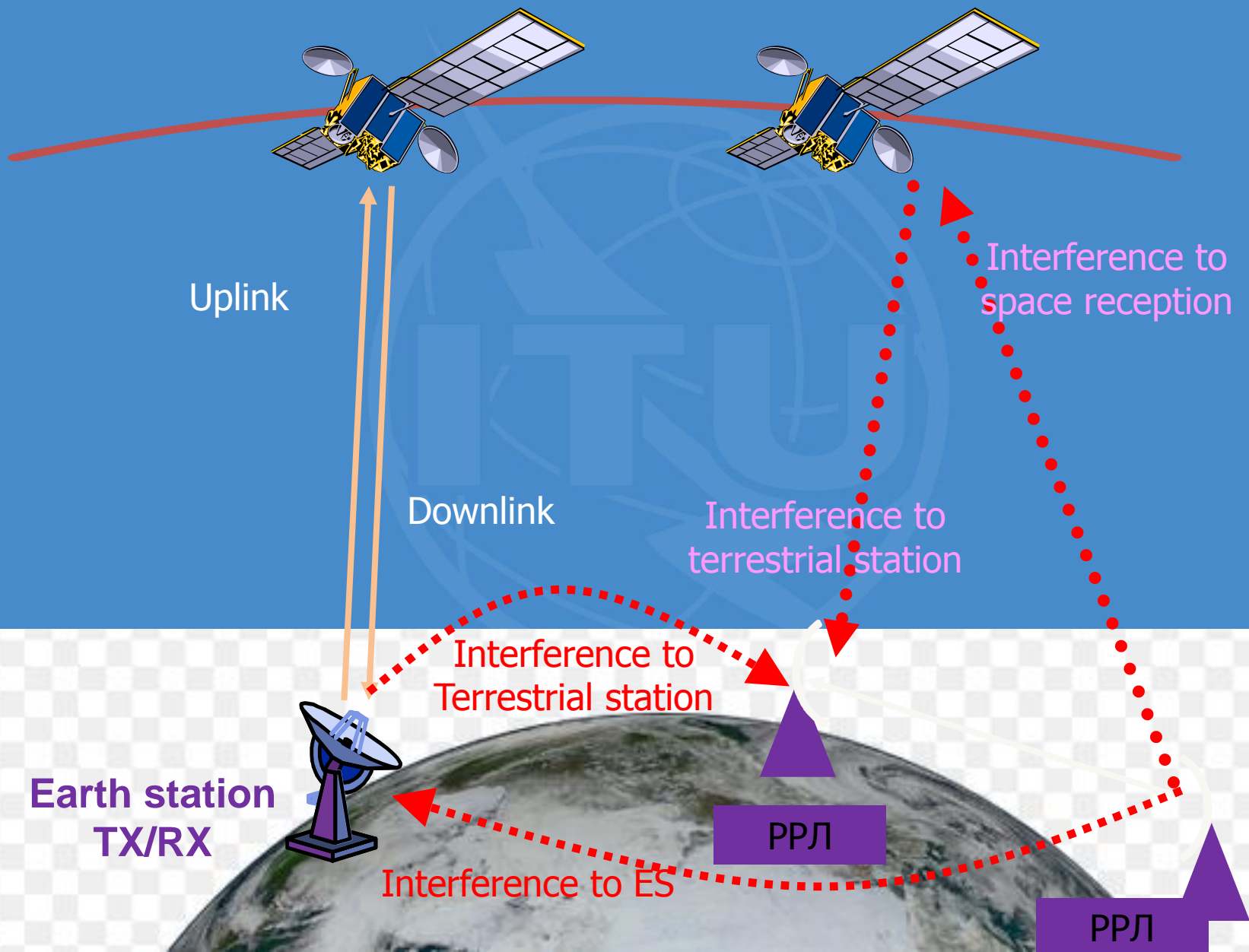
- More than 70 frequency bands between 137 MHz and 76 GHz are allocated with equal rights to terrestrial and space services

5 570-7 250 MHz

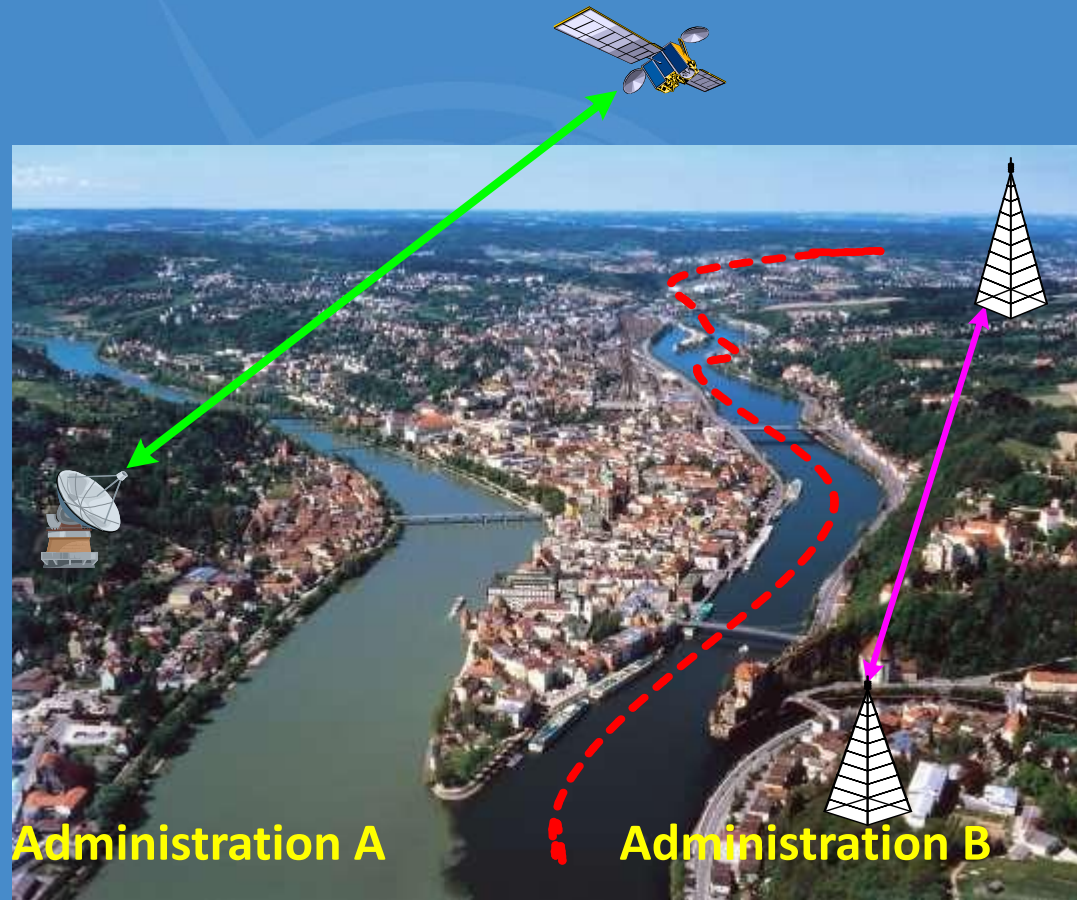
Allocation to services

Region 1	Region 2	Region 3
6 700-7 075	FIXED FIXED-SATELLITE (Earth-to-space)(space-to-Earth) 5.441 MOBILE 5.458 5.458A 5.458B 5.458C	

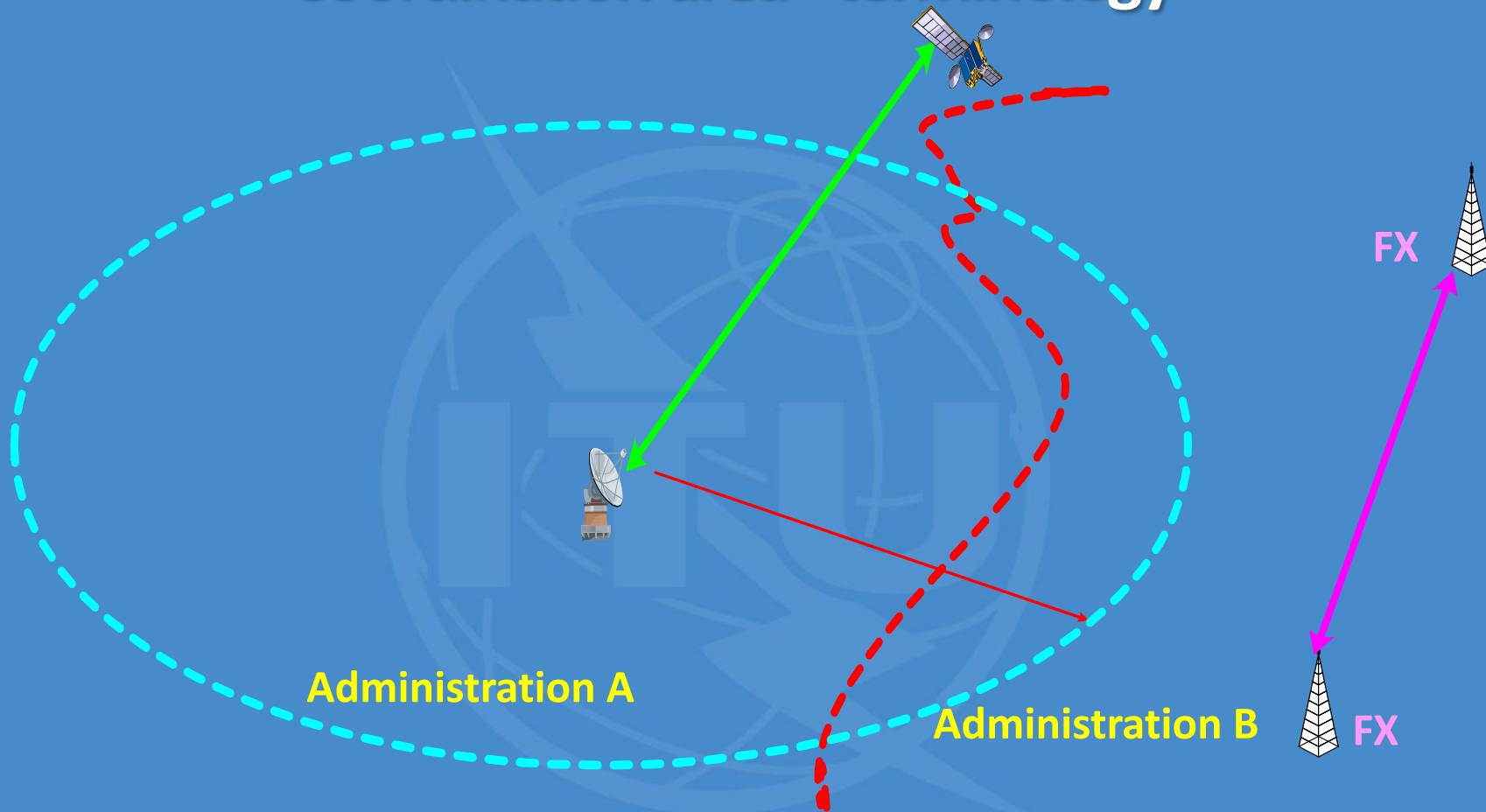
Interference scenarios



Sharing terrestrial and earth stations – coordination area



Coordination area - terminology



Coordination distance: distance in a given azimuth from earth station, beyond which the level of permissible interference will not be exceeded and coordination is therefore not required

Coordination contour: line enclosing coordination area

Coordination area: zone around beyond which the level of permissible interference will not be exceeded and coordination is therefore not required

Requirements for coordination

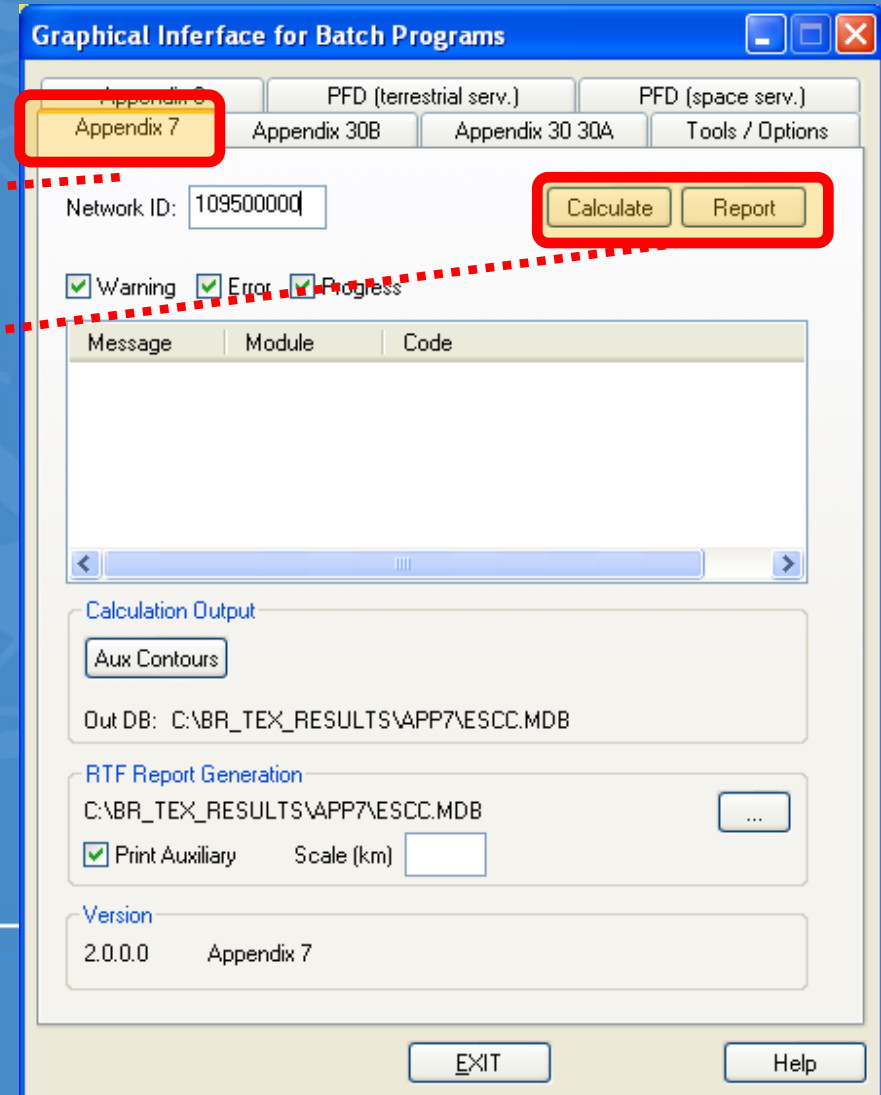
- The purpose of coordination area is to identify the area within which detailed evaluations of the interference potential need to be performed
- Coordination of transmitting or receiving earth station is required, if the coordination area crosses the boundary of a neighboring country
- The coordination area of a coordinated ES is the zone where the ES has the right to work with the notified parameters and agreed levels of interference
- Terrestrial transmitters should be coordinated if they are located within the coordination area of a coordinated reception ES
- The calculation of the coordination area -> Appendix 7 RR

Establishment of coordination area

- Coordination area calculations are incorporated in program **GIBC**

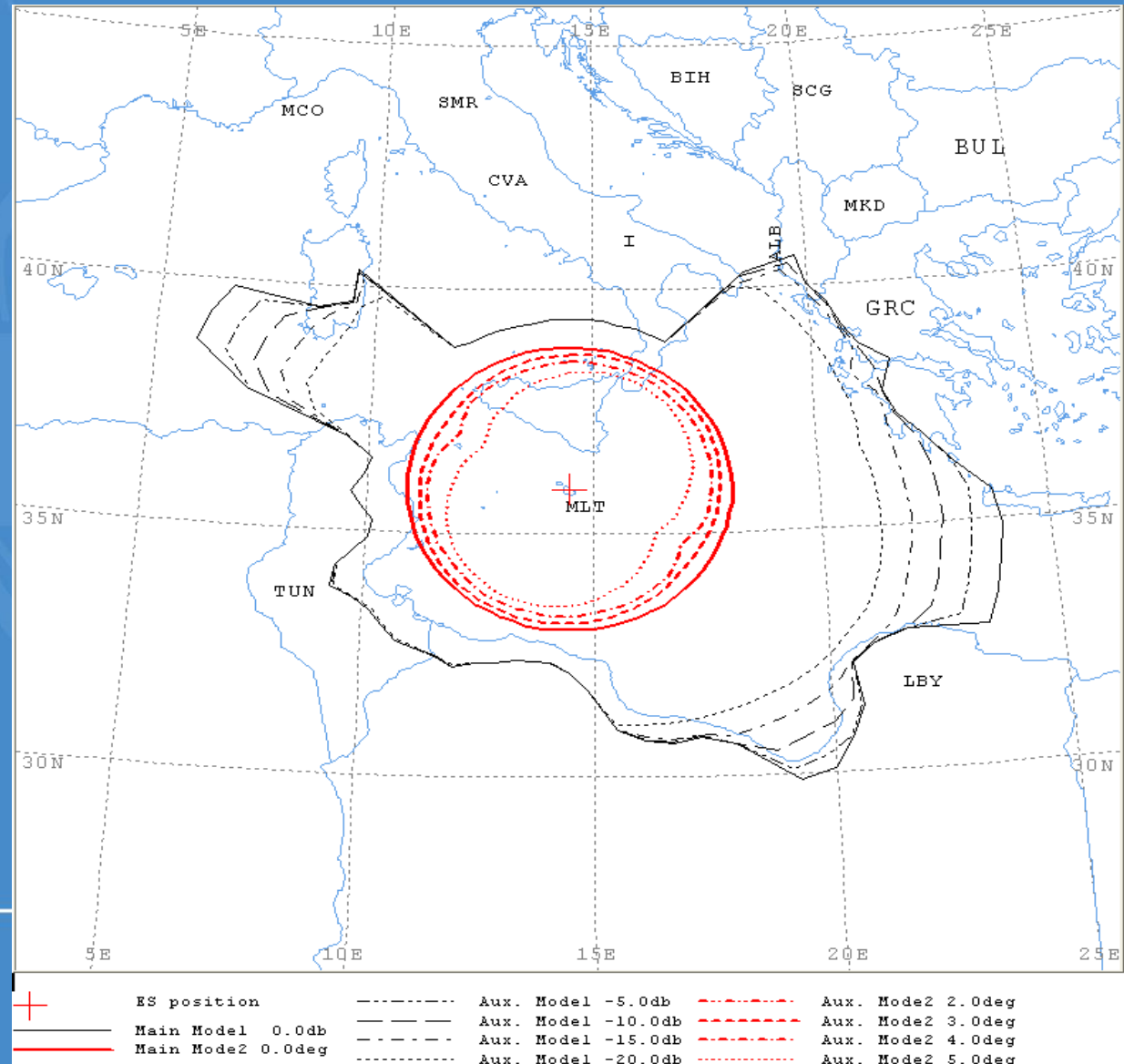
Appendix 7

Start calculations

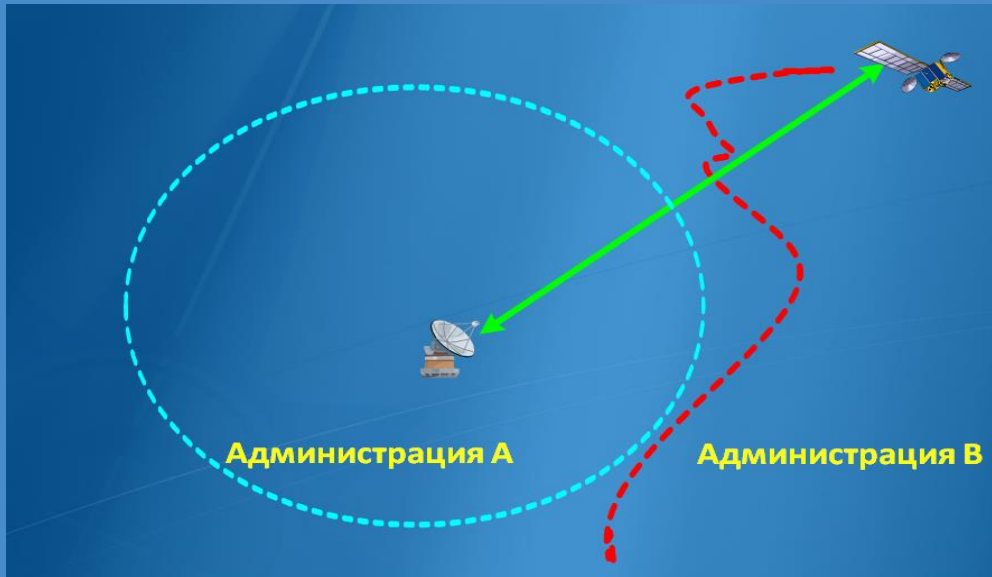


Пример расчета координационной зоны в GIBС

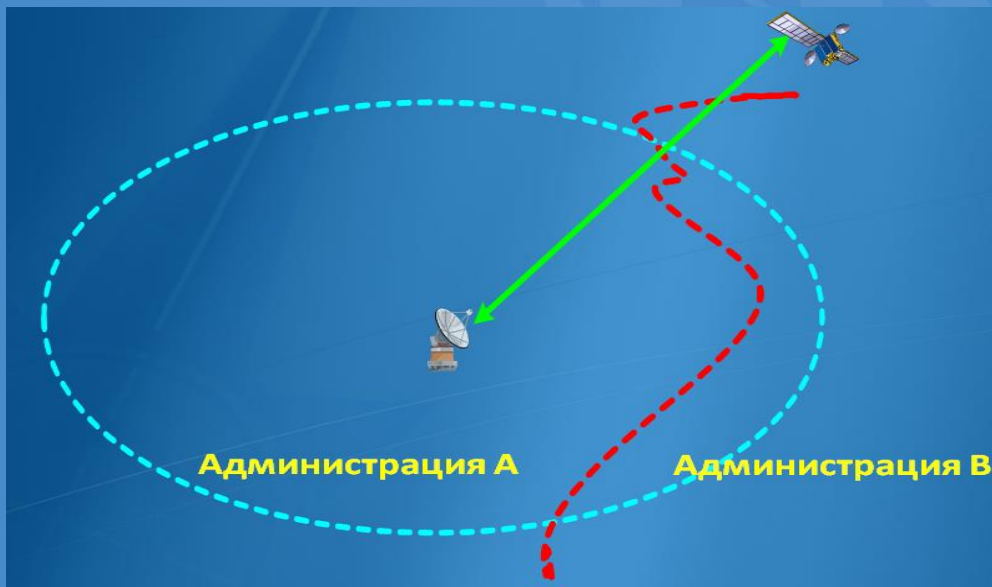
- The calculation for the receiving ES of Malta (FSS) in the frequency band 3850 - 4200 MHz
- Affected administration: ALB, GRC, I, LBY, MLT, TUN
- 2 contours – 2 propagation mechanisms



Need for coordination for earth stations



Coordination is not required if coordination area does not overlap with neighboring country

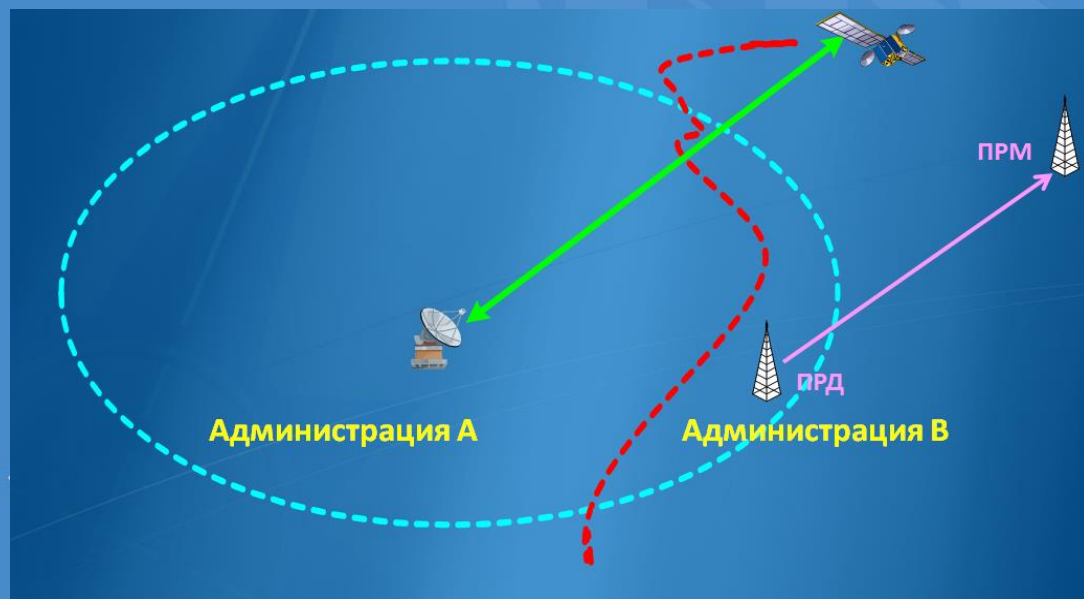


Coordination is required if coordination area overlaps into a neighboring country

Need for coordination for terrestrial stations



Coordination is not required if terrestrial transmitter is outside a coordination area

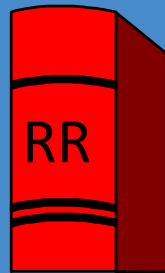


Coordination is required if terrestrial transmitter is within a coordination area

Examination of frequency assignments

Processing of assignments for recording in MIFR

*Notification by
administration*



*Validation
by BR*



*Publication
BRIFIC - P1*



*Examinations
by the BR,
formulation of
findings*



*Publication
BRIFIC - P2*



MIFR



*Publication
BRIFIC - P3*



*Return of
notice*

Examination of FXM frequency assignments

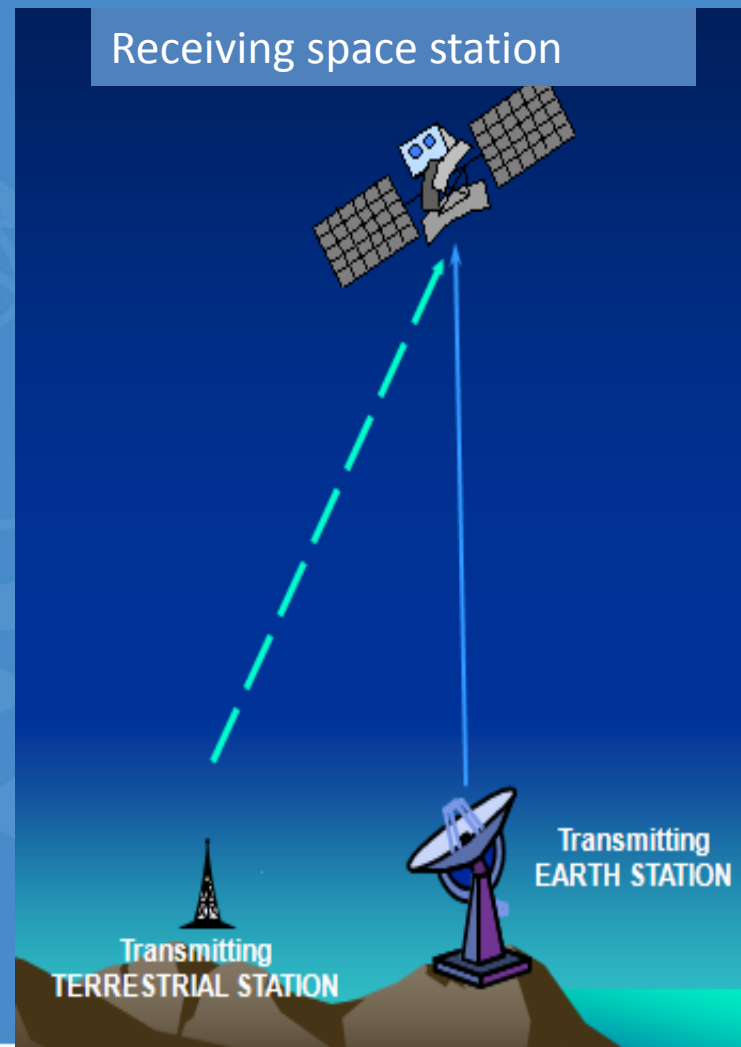
- Types of examination by the BR:
 - **Regulatory** -> vis-à-vis Table of Frequency Allocations and other provisions of Radio Regulations (No. **11.31**)
 - **Coordination** -> vis-à-vis mandatory coordination procedures (No. **11.32**)
 - **Probability of harmful interference** (technical examination)-> compatibility analysis vis-à-vis existing assignments recorded with favorable finding (No. **11.33**)
 - **Conformity to Plan** -> conformity of notified parameters to parameters recorded in a world or regional assignment or allotment Plan (No. **11.34**)

Regulatory examination

- **Regulatory examination, check for:**
 - Table of frequency allocations, including footnotes:
 - Notified band within the band allocated to the service
 - Receiving point is in country where allocation exists
 - Category of allocation – primary or secondary
 - Coordination procedure of No. 9.21, when applicable
 - Other RR provisions:
 - Power limits Nos. 21.3 – 21.5A
 - Specific requirements for services (e.g. classes of emission, channeling arrangements, power limits for MMS in HF bands)

Regulatory and coordination examination

- Protection of receiving space stations: Art. 21 power limits on transmitters in fixed and mobile services:
 - No. 21.3: e.i.r.p. ≤ 55 dBW
 - No. 21.4 (protection of GSO): e.i.r.p.:
 - ≤ 47 dBW within 0.5° of GSO
 - $\leq 47 - 55$ dBW between 0.5° and 1.5° of GSO
 - No. 21.5: Power to antenna :
 - ≤ 13 dBW in bands 1- 10 GHz
 - ≤ 10 dBW above 10 GHz
 - No. 21.5A: Power to antenna ≤ -3 dBW for FX in 18.6- 18.8 GHz
- 21.3 – 21.5A: in bands of Table 21-2



Coordination examination

- **Coordination examination**, check for completion of:
 - Coordination with receiving earth stations
 - RR9.16, RR9.18: coordination with receiving earth stations in the shared bands
 - RR 9.19: vis-à-vis typical stations in the broadcasting-satellite service
 - Coordination of non-planned service in bands and areas governed by regional agreements (i.e. GE85M, GE89...)
 - Example: GE85 Agreement contains a plan for maritime mobile service. If a fixed station in the GE85M planned band is notified to the MIFR, it shall be coordinated beforehand. The completion of this coordination is checked during **Coordination Examination**

Conformity to Plan examination

- **Conformity to plan examination**, conformity with:
 - Worldwide allotment plans for maritime mobile and aeronautical mobile services (AP25, AP26 and AP27)
 - Notified frequency is in allotted channel listed in the Plan
 - Notified geographical area corresponds to a Plan allotment
 - Receiving area is within the allotment area
 - For AP26, AP27 – if notice is not in conformity with Plan - examination vs. existing assignments and allotments
 - Regional assignment plans (GE85-R1-MAR, GE85-R1-AER and GE06) -> notified parameters correspond to the parameters recorded in a Plan

Technical examination

- **Probability of harmful interference**
 - **For shared bands:** consists in compatibility analysis vis-à-vis existing assignments recorded with favorable findings, when coordination under Nos. 9.16 or 9.18 could not be successfully completed
 - **For AP26 and AP27 Plans:** if an assignment is **not** in conformity with the allotment plan, the BR assesses interference to the allotments in the Plan. If the interference is within the specified limits, assignment is recorded in the MIFR



Thank you !