

**ITUWORKSHOPS**

# 1<sup>st</sup> ITU Inter-regional Workshop on WRC-19 Preparation

21 - 22 November 2017

Geneva, Switzerland

[www.itu.int/go/ITU-R/wrc-19-irwsp-17](http://www.itu.int/go/ITU-R/wrc-19-irwsp-17)



## 1<sup>st</sup> ITU INTER-REGIONAL WORKSHOP ON WRC-19 PREPARATION (Geneva, 21-22 November 2017)

# WRC-19 agenda item 1.15 (FS & MS Applications in 275-450 GHz)

***Raphael G. de Souza***  
***Chairman, WP 1A***



90<sup>th</sup> Anniversary  
CCIR - ITU-R Study Groups  
(1927-2017)

Organized by:





# WRC-19 agenda item 1.15

to consider identification of frequency bands for use by administrations for the land-mobile and fixed services applications operating in the frequency range 275-450 GHz, in accordance with Resolution 767 (WRC-15)



# Situation in the Radio Regulations

248-3 000 GHz

| Allocation to services |                 |          |
|------------------------|-----------------|----------|
| Region 1               | Region 2        | Region 3 |
| ...                    |                 |          |
| 275-3 000              | (Not allocated) | 5.565    |

**5.565** The following frequency bands in the range 275-1 000 GHz are identified for use by administrations for passive service applications:

- radio astronomy service: 275-323 GHz, 327-371 GHz, 388-424 GHz, 426-442 GHz, 453-510 GHz, 623-711 GHz, 795-909 GHz and 926-945 GHz;
- Earth exploration-satellite service (passive) and space research service (passive): 275-286 GHz, 296-306 GHz, 313-356 GHz, 361-365 GHz, 369-392 GHz, 397-399 GHz, 409-411 GHz, 416-434 GHz, 439-467 GHz, 477-502 GHz, 523-527 GHz, 538-581 GHz, 611-630 GHz, 634-654 GHz, 657-692 GHz, 713-718 GHz, 729-733 GHz, 750-754 GHz, 771-776 GHz, 823-846 GHz, 850-854 GHz, 857-862 GHz, 866-882 GHz, 905-928 GHz, 951-956 GHz, 968-973 GHz and 985-990 GHz.

The use of the range 275-1 000 GHz by the passive services does not preclude use of this range by active services. Administrations wishing to make frequencies in the 275-1 000 GHz range available for active service applications are urged to take all practicable steps to protect these passive services from harmful interference until the date when the Table of Frequency Allocations is established in the above-mentioned 275-1 000 GHz frequency range.

All frequencies in the range 1 000-3 000 GHz may be used by both active and passive services. (WRC-12)



# ITU-R Preparatory Studies in response to [Res. 767 \(WRC-15\)](#)

## Responsible Group: ITU-R Working Party [\(WP\) 1A](#)

- Take into account **information/result of studies from contributing groups**
- **Conduct sharing and compatibility studies** (Res. **767 (WRC-15)** invites ITU-R 4)
- **Identify candidate frequency bands** for use by systems in LMS & FS **while maintaining protection of passive services** identified in No. **5.565** (Res. **767 (WRC-15)** invites ITU-R 5)

## Contributing Groups (to provide WP 1A before June 2017 with information and results of studies):

- [WP 3J](#), [WP3K](#), [WP 3M](#) (provide WP 1A with results of studies with respect to Res. **767 (WRC-15)** invites ITU-R 3 (i.e. **propagation models**))
- [WP 5A](#), [WP 5C](#) (provide WP 1A with results of studies with respect to Res. **767 (WRC-15)** invites ITU-R 1 and 2 (i.e. technical & operational characteristics and spectrum needs of systems) for applications in the **land-mobile and fixed services**)
- [WP 7C](#), [WP 7D](#) (provide WP 1A with information on the technical and operational characteristics of **passive systems**)

## Interested Groups: [WP 4A](#), [WP 5D](#), [WP 6A](#)



# Status of the ITU-R studies (1/4)

**WP 1A** has developed [Report ITU-R SM.2352](#) on **Technology trends of active services in the frequency range 275-3 000 GHz** (was approved by SG 1 in June 2015 in response to [Question ITU-R 237/1](#))

- In response to AI 1.15, **WP 1A** is developing Working Documents on
- a draft new Report ITU-R SM.[275-450GHZ\_SHARING] on **Sharing and compatibility studies between land-mobile, fixed and passive services in the frequency range 275-450 GHz** (see [Annex 3](#) to [Doc. 1A/208](#))
  - **Draft CPM text** on AI 1.15 for Chapter 1 of the draft CPM Report to WRC-19 (see [Annex 1](#) to [Doc. 1A/208](#))

In accordance with its work plan in [Annex 2](#) to [Doc. 1A/208](#), WP 1A will meet on 23-30 Nov. 2017 and between 4-12 June 2018 to finalize the draft CPM text



# Status of the ITU-R studies (2/4)

In the WD2PDN Report ITU-R SM.[275-450GHZ\_SHARING] so far:

➤ List of relevant **ITU-R Rec. on propagation issues**: [P.452](#); [P.525](#); [P.619](#); [P.676](#); [P.840](#) and newly approved ones: [P.2108](#) ; [P.2109](#)

➤ **System characteristics of LMS applications** in 275-450 GHz:

- ✓ CPMS for large file sizes to be transferred in a few seconds
- ✓ Intra-device communications
- ✓ Wireless links in data centers

Note: updated information expected from the Nov'17 meeting of [WP 5A](#) , to be considered at the Nov'17 meeting of WP 1A.

➤ **System characteristics of FS applications** in 275-450 GHz:

- ✓ Point-to-point fronthaul and backhaul (bet. BBU to RRH)
- ✓ [Fixed Service Links in Networks]
- ✓ [Emergency Restoration of Optical Fiber Communications Links]

Note: updated information expected from the Nov'17 meeting of [WP 5C](#), to be considered at the Nov'17 meeting of WP 1A.



# Status of the ITU-R studies (3/4)

Also in the WD2PDN Report ITU-R SM.[275-450GHZ\_SHARING]:

- **System characteristics of RAS operating** in 275-450 GHz, with:
  - ✓ threshold levels of detrimental interference
  - ✓ locations of 11 RAS stations using this band

Note: updated information received from the Oct'17 meeting of [WP 7D](#), to be considered at the Nov'17 meeting of WP1A.
  
- **System characteristics of EESS (passive) operating** in 275-450 GHz, with:
  - ✓ permissible interference levels for EESS passive remote sensing systems
  - ✓ scientific interest in several bands for studies of meteorology/climatology and atmospheric chemistry

Note: updated information received from Oct'17 meeting of [WP 7C](#), to be considered at the Nov'17 meeting of WP 1A.
  
- **Sharing and compatibility studies still under development**



# Status of the ITU-R studies (4/4)

In addition to the **Summary and Analysis of the results of the studies** (technical & operational characteristics; spectrum needs; sharing and compatibility studies),

**the draft CPM text will mainly describe:**

➤ **The Methods to satisfy the agenda item**

**A** – No change, which may be accompanied by reasons.

**B** – Id. the freq. band to the LMS and FS app. by MOD No. **5.565**  
(with Method B1 only for LMS and Method B2 only for FS)

**C** – Id. the freq. band to the LMS and FS applications by a new FN (with Method C1 only for LMS and Method C2 only for FS)

**Other methods – ...]**

[to be developed ...]

➤ **The Regulatory and procedural considerations**

[to be developed ...]



# List of acronyms and abbreviations

|      |                                     |
|------|-------------------------------------|
| BBU  | Base band unit                      |
| CPMS | Close proximity mobile system       |
| EESS | Earth exploration-satellite service |
| FS   | Fixed service                       |
| LMS  | Land mobile service                 |
| RRH  | Remote radio head                   |
| RAS  | Radio astronomy service             |