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#ITUWRC

## Session 4 - Science Issues
## WRC-23 agenda items 1.13

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***Chairman Working Party 7B***

# WRC-23 AI 1.13 (Resolution 661 (WRC-19)

## Upgrade of the secondary SRS allocation in the band 14.8 – 15.35 GHz to primary status

- The 14.8-15.35 GHz is currently allocated to the SRS on a secondary basis without any limitation as to the directionality of the link (s-s, s-E, E-s)
- The band is currently used, or planned/desired to be used, for the following purposes:
  - Feeder uplinks to the GSO Data Relay Satellite (DRS) systems of multiple administrations
  - Inter-orbit return links from NGSO science missions to GSO DRS satellites of multiple administrations
  - Space-to-Earth downlinks (potentially with high data rates) for near-Earth SRS missions
  - Potential use for lunar surface to/from lunar orbit links
- DRS systems provide critical communications and tracking services for a wide variety of users including flagship robotic science missions and manned space missions
  - Protected spectrum and regulatory certainty for essential DRS infrastructure links is critical for space mission planning and exploration

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## Upgrade of the secondary SRS allocation in the band 14.8 – 15.35 GHz to primary status

- Additionally, the availability of a large block of spectrum allocated on a primary basis for SRS downlinks would address multiple issues with existing allocations
  - Existing primary SRS allocations in the 2200-2290 MHz and 8450-8500 MHz SRS bands are highly (and increasingly) congested and lack sufficient bandwidth to support future SRS mission needs
  - Per **5.536A**, the SRS (s-E) allocation in 25.5-27 GHz is effectively secondary to FS & MS
- This AI *seeks* to provide a secure regulatory foundation to support use of the 14.8-15.35 GHz band to meet the growing needs of future SRS missions

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## Upgrade of the secondary SRS allocation in the band 14.8 – 15.35 GHz to primary status

- Working Party (WP) 7B has completed development of a new Recommendation documenting the expected typical characteristics of SRS systems operating in this band for each of the applications/links listed above
- Sharing and compatibility studies are currently in process in WP 7B with the interim results being recorded in the *Working Document towards a Preliminary Draft New Report ITU-R SA.[15 GHz SRS SHARING]* captured in the WP 7B Chairman's Report

  - The current allocation status of this band and adjacent bands is shown in this table

| Allocation to services | | |
|---|---|---|
| **Region 1** | **Region 2** | **Region 3** |
| **14.75-14.8**<br>FIXED<br>FIXED-SATELLITE (Earth-to-space) 5.510<br>MOBILE<br>Space research 5.509G | | **14.75-14.8**<br>FIXED<br>FIXED-SATELLITE (Earth-to-space) 5.509B 5.509C 5.509D 5.509E 5.509F 5.510<br>MOBILE<br>Space research 5.509G |
| **14.8-15.35** | FIXED<br>MOBILE<br>Space research<br>5.339 | |
| **15.35-15.4** | EARTH EXPLORATION-SATELLITE (passive)<br>RADIO ASTRONOMY<br>SPACE RESEARCH (passive)<br>5.340 5.511 | |

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## Upgrade of the secondary SRS allocation in the band 14.8 – 15.35 GHz to primary status

- Sharing studies between the FS and the SRS (s-E),(s-s) are complete
  - Studies consider cases for both co-located and non-co-located ground/earth stations
  - Static and dynamic studies demonstrate sharing feasibility between FS and SRS GSO & NGSO downlinks as well as SRS DRS inter-orbit (s-s) return links
- Studies between the LMS and the SRS (s-E) are largely complete
  - Studies consider cases for both co-located and non-co-located ground/earth stations
  - Static analyses demonstrate sharing feasibility between LMS and SRS downlinks
- Sharing studies between the LMS and SRS DRS (s-s) are in process
- Sharing studies between the AMS and SRS (s-E) and (s-s) are also in process
  - Note that studies performed to date have used AMS system characteristics in ITU-R Recommendation M.2089 identified to WP 7B by WP 5B
  - Additional AMS characteristics for Helicopter Television Transmission Systems (HTTS) provided to WP 7B in a contribution from an administration are also under consideration
  - In-band sharing studies between the SRS NGSO (s-E) and AMS uplinks have been performed and are close to being finalized – demonstrate sharing is feasible
  - Sharing studies for SRS GSO downlink and SRS DRS (s-s) link vs AMS uplink cases as well as all AMS downlink and AMS crosslink cases have been identified in the sharing report and are expected to be submitted to the April 2021 WP 7B meeting

# WRC-23 AI 1.13 (Resolution 661 (WRC-19)

## Upgrade of the secondary SRS allocation in the band 14.8 – 15.35 GHz to primary status

- Out-of-band compatibility studies for the radio astronomy service in the 15.35 – 15.4 GHz band have also been identified in the Report and are expected to be submitted to the April 2022 WP 7B meeting
- No characteristics have been identified for EESS (passive) or SRS (passive) systems operating on a secondary basis in-band in the 15.2 – 15.35 GHz band or on a primary basis in the adjacent 15.35 – 15.4 GHz band
- Development of CPM text was initiated at the September 2021 WP 7B meeting
- Sharing studies and the CPM report are expected to be finalized at the September 2022 meeting

# Study Scenarios

| | Interferer | Victim | Comments |
|---|---|---|---|
| 1 | SRS mission direct data downlink<br>Low-orbiting satellite DL: GSO satellite DL<br>HEO satellite DL,<br>L1/L2 satellite DL | In-band fixed & mobile station<br>Radio astronomy stations | Line-of-sight propagation assumed<br>RAS in adjacent 15.35-15.4 GHz band |
| 2 | SRS DRS forward feeder link<br>DRS earth station UL | | |
| 3 | SRS DRS Return Inter-Orbit Link<br>Low-orbiting satellite IOL | | |