

RSPG Workshop

The future of the 470-694 MHz band within the EU

Panel 3 – Radio Astronomy Service (RAS)
Brussels – 11 April 2025

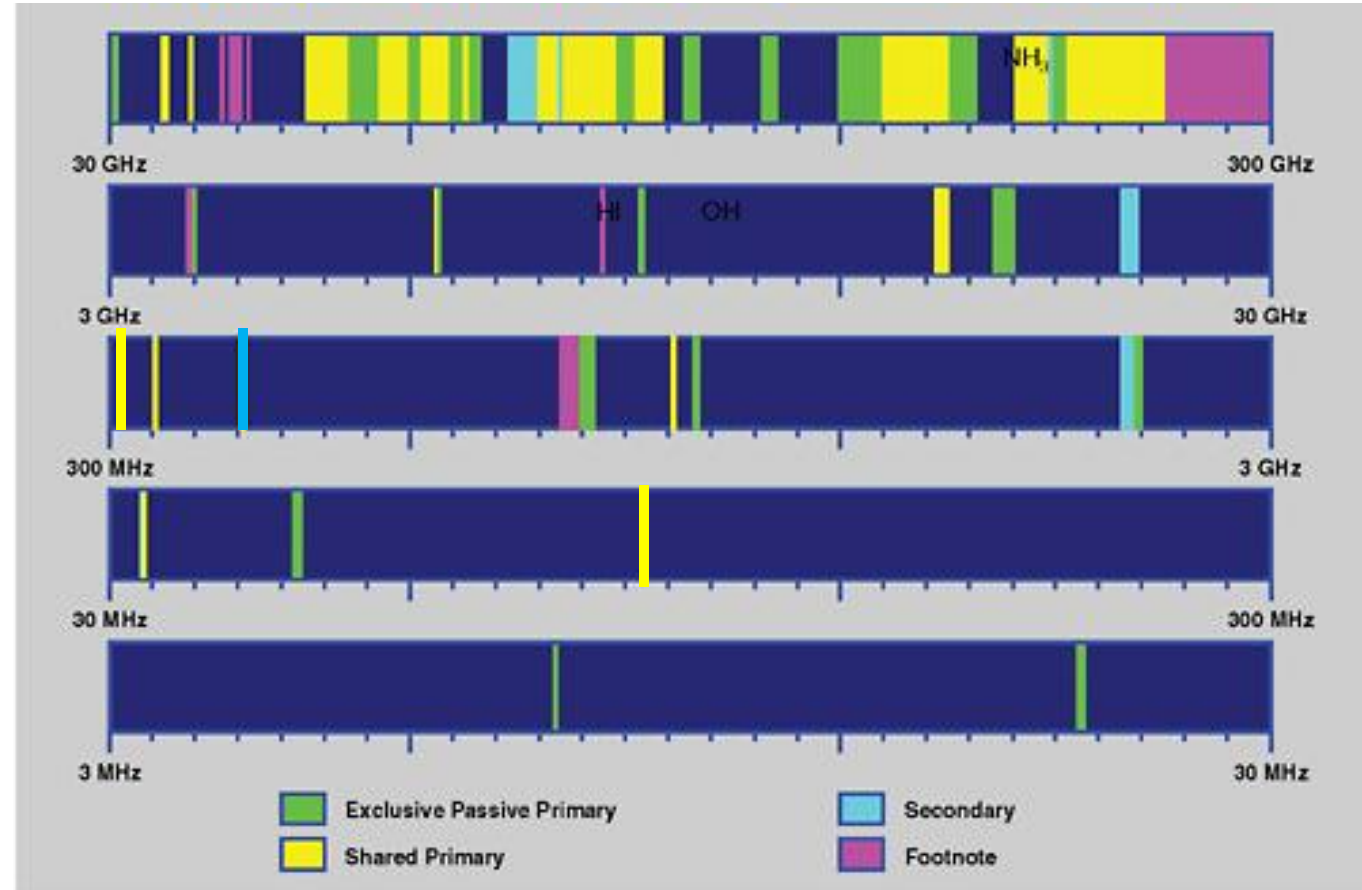
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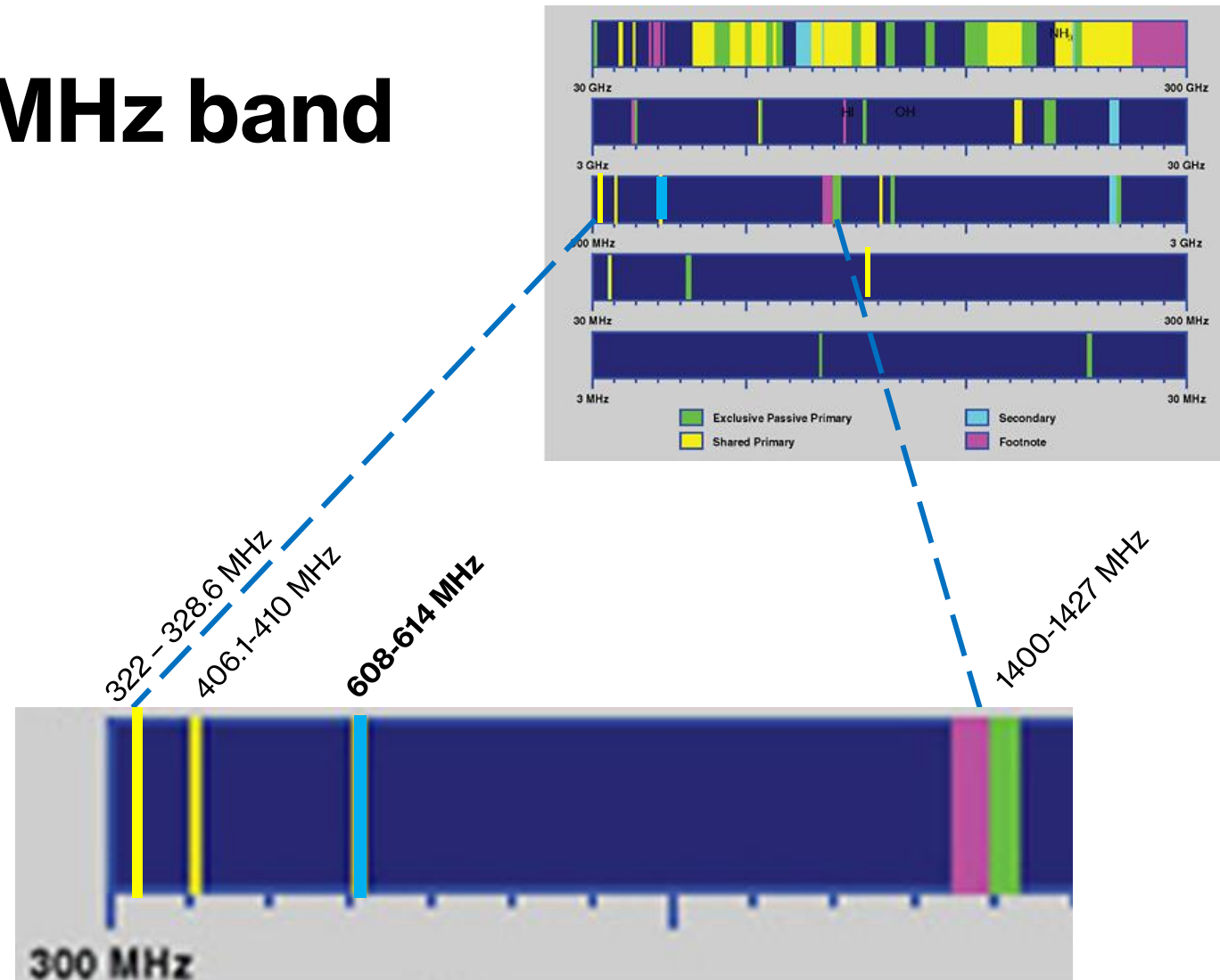
RAS Spectrum

- Passive use.
- Representative allocations.
- Natural phenomena.
- Permanent, cannot be shifted or replaced.
- High sensitivity to interference.

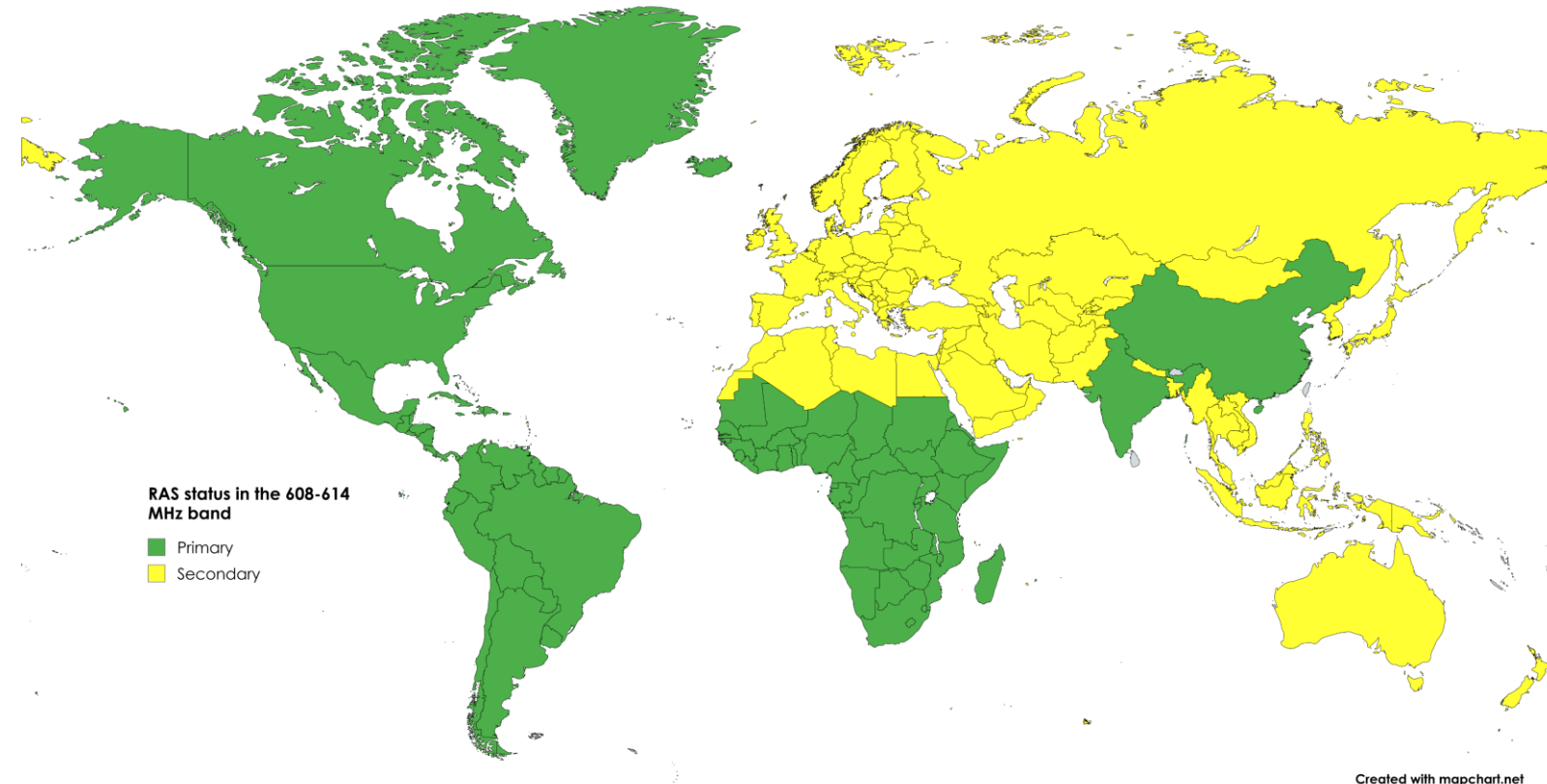


RAS in the 608-614 MHz band

- Fills the gap between the two RAS allocations 406.1-410 MHz and 1400-1427 MHz.
- Scientific importance:
 - High precision timing observations of pulsars (Rep. ITU-R RA.2099-1).
 - Together with the bands 322-328.6 MHz and 1400-1427 MHz, the band is used in observations of linearly polarized extra-terrestrial radio emissions.
 - Solar radio astronomy: Observations of the long-term contribution of changing solar activity to global climate change on the Earth.
 - VLBI observations by the European VLBI Network (EVN).



Regulatory status (RAS 608-614 MHz)



Primary allocation:

- Region 1: African Broadcasting Area (RR 5.304)
- Region 2
- Region 3: China – India (RR 5.305)

Secondary allocation:

- Rest of the world (RR 5.306)

Also covered by RR 5.149

Coexistence with the broadcasting service

- **GE06 agreement**

Contains technical parameters and protection criteria for the compatibility between RAS and the broadcasting services.

- **National arrangements**

In several member states, the tv channel 38 has been disabled to avoid interference into the RAS observations in the 608-614 MHz band.

- **CEPT documentation : ERC Report 85**

Compatibility analysis of radio astronomy in the frequency range 608 – 614 MHz with DVB-T

Coexistence with IMT

ITU-R studies

- Studies under WRC-23 agenda item 1.5.
- Rep. ITU-R RA.2332-0 : Compatibility and sharing studies between the radio astronomy service and IMT systems in the frequency bands 608-614 MHz.

Results

- In-band sharing between will be very difficult, if not impossible.
- Compatibility in the adjacent band can be achieved through separation distances.
- The order of separation distances might not be applicable for the European case.
- Possible mitigation measures: Guard bands, frequency arrangements, or reducing unwanted emission levels.

Separation distances for in-band sharing

Zone	BS (km)	UE (km)
Single-interferer worst-case scenario		
Urban, suburban, rural	744	370
Aggregated scenario		
Uniform deployment (2% / 50%)	1 053 / 1 051	445 / 441
Clustered deployment (2% / 50%)	1 053 / 1 051	445 / 441

Separation distances for adjacent band operation

Zone	BS (km)	UE (km)
Single-interferer worst-case scenario		
Urban, suburban, rural	414	229
Aggregated scenario		
Uniform deployment (2% / 50%)	525 / 523	155 / 147
Clustered deployment (2% / 50%)	525 / 523	155 / 147

— Conclusion

RAS in the 608-614 MHz band

- Permanent usage.
- High Scientific importance.

Current situation

- Protection measures through the GE06 agreement and national arrangements.

Ideal situation for the next decade

- Introduction of new mobile primary allocations should be associated with an upgrade of the RAS secondary allocation in the band 608-614 MHz to a primary allocation.
- The RAS shall not claim additional protection from the existing broadcasting service in that case.
- Harmonized approach is preferred to resolve any cross-border issues.