

CRAF comments to the Draft RSPG Opinion on the role of radio spectrum policy to help combat climate change

The Committee on Radio Astronomy Frequencies (CRAF) welcomes the opportunity to provide its comments on the Draft RSPG Opinion on the role of radio spectrum policy to help combat climate change. CRAF, On behalf of European radio astronomers, coordinates activities to keep the frequency bands used by radio astronomy and space sciences free from interference.

CRAF supports the initiative by RSPG to involve radio spectrum policy in the fight against climate change. CRAF believes the radio spectrum policy can play an important role in this fight, if the issue received the proper attention from radio spectrum regulators.

1- On RSPG opinion:

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18) Member States should recognize that monitoring of climate change, collecting data for weather forecasting or gathering climate-related data are important tools to provide evidence related to combatting climate change and facilitate the response to its consequences. In consequence Member States and the European Commission should ensure long-term spectrum availability and protection for radio systems supporting them, where appropriate.

19) RSPG notes that bands used for gathering climate-related data by passive sensing require particular protection, as recognized by international regulation.”

Similar to the situation with the passive services EESS, MetSat and MetAids that are used for climate monitoring and weather forecasting, the Radio Astronomy Service (RAS) operations also covers the solar activity observations and forecasts. The longest quantitative record of solar activity is essential for the understanding of the long-term contribution of changing solar activity to global climate change on Earth. The estimation of this contribution is necessary while assessing the contribution from human-produced emissions to the climate change.

Noting that there are several common bands used for the operations of the abovementioned passive services including RAS, in particular the bands protected by ITU RR No 5.340, the protection of these bands requires stricter treatment by the European regulators. The bands covered by ITU RR No 5.340, which prohibits all emissions, are currently under high pressure by industry to create sharing conditions with active services for using them. Rising number of attempts by active services is observed during the last decade to get exceptions on the regional CEPT level to use these passive bands relying on few precedents made before for UWB applications below 10 GHz. Such precedents, even if successful to get an exception, remains in violation to the radio regulations as an international treaty. Hence, CRAF invites RSPG to explicitly mention the ITU RR No. 5.340 under bullet (19) in the draft opinion. A statement can be added that these bands represent essential natural resources and invites Member States to respect their obligations not to deviate from the radio regulations in accordance with the ITU-R Rules of Procedures that prevents sharing these bands, even under article 4.4 of the radio regulations.

Proposed text:

19) RSPG notes that bands used for gathering climate-related data by passive sensing, in particular the bands protected by ITU RR No 5.340, require appropriate protection, in accordance with the international regulations.

2 – On RSPG opinion:

“20) Members States should cooperate actively in order to assess and solve interference which impacts upon weather forecasting, monitoring of climate change or collecting data for weather forecasting, gathering climate-related data. Member States should cooperate actively to implement corrective actions, including at international level as appropriate, in order to avoid long term interference situations. The European Commission and Member States, where appropriate, should cooperate on implementing EU regulatory measures or, as appropriate, improvement of the EU regulatory framework

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CRAF supports the requirement to avoid long term existing interference situations, as well as future situations that could result from the regulatory changes introduced by the WRCs agenda items. Thus preventive as well as corrective actions are required.

The current agenda items at WRC23 involve bands that are essential for solar activity observations. Agenda item 1.5 on UHF spectrum review in region 1 will directly impact the RAS band 606-614 MHz actively used for solar radio astronomy. The band that has a primary allocation status in almost all areas world wide where RAS observations exist, is still under secondary allocation in Europe. The survival of the solar observations in this band could be achieved only through an upgrade to a primary status in Europe similar to the situation worldwide. A sufficient protection level will also need to be provided for space weather sensors under agenda item 9.1 A). CRAF recommends that RSPG specifically guide Member State positions for the WRC agenda items to take into consideration the protection of the relevant bands to passive sensing.

Proposed text:

“ 20) Members States should cooperate actively in order to assess and solve interference which impacts upon weather forecasting, monitoring of climate change or collecting data for weather forecasting, gathering climate-related data. Member States should cooperate actively to implement preventive and corrective actions, including at ITU-R WRCs level as appropriate, in order to avoid long term interference situations. The European Commission and Member States, where appropriate, should cooperate on implementing EU regulatory measures or, as appropriate, improvement of the EU regulatory framework

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3- On RSPG opinion:

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2) RSPG invites the European Commission to always take energy efficiency and other climate related aspects into account when funding research within the wireless sector, such as 6G.

and

6) The RSPG welcomes wireless ECS sector cooperation and coordination to develop energy efficient standards and to design services and equipment based on such standards.

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In addition to 6G, CRAF proposes to add LEO satellite mega-constellations to opinion (2), especially with the plans of the European Commission to launch its own mega-constellation soon for internet services. Such high number of satellite systems, in addition to the optical and radio interference anticipated from them, would contribute by a significant amount of aluminum and carbon deposition in the Earth's high-altitude atmosphere. The long term debris of these mega-constellations could also threaten the operations of space-based passive services infrastructure. More info on the environmental impact of mega-constellations can be found in [1].

Proposed text:

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2) RSPG invites the European Commission to always take energy efficiency and other climate related aspects into account when funding research within the wireless sector, such as 6G and LEO satellite constellations.

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Finally, an indirect element in reducing the emissions could be through promoting the spectrum management meetings to be on hybrid basis. As aviation contributes about 2% of the world's global carbon emissions, the large number of spectrum management meetings at ITU/EC/CEPT-ECC could be held on a hybrid basis for the long term. The recent virtual meetings held during the pandemic , although were perhaps slightly less efficient, proved that travel could be reduced and thus minimizing the transportation emissions.

References:

[1] Boley, A.C., Byers, M. Satellite mega-constellations create risks in Low Earth Orbit, the atmosphere and on Earth. *Sci Rep* **11**, 10642 (2021). <https://doi.org/10.1038/s41598-021-89909-7>