

## RESOLUTION 176 (REV.WRC-23)

**Studies on the use of the frequency bands 47.2-50.2 GHz (Earth-to-space) and 50.4-51.4 GHz (Earth-to-space), or parts thereof, by aeronautical and maritime earth stations in motion in the fixed-satellite service**

The World Radiocommunication Conference (Dubai, 2023),

*considering*

- a)* that the frequency bands 47.2-50.2 GHz (Earth-to-space) and 50.4-51.4 GHz (Earth-to-space) are globally allocated on a primary basis to the fixed-satellite service (FSS);
- b)* that there is an increasing need for mobile communications, including global broadband satellite services, and that some of this need can be met by allowing aeronautical and maritime earth stations in motion (ESIMs) to communicate with FSS space stations operating in the frequency bands mentioned in *considering a)*;
- c)* that in the FSS, there are geostationary-satellite (GSO) networks and non-geostationary (non-GSO) systems operating and/or planned for near-term operation in the frequency bands mentioned in *considering a)* that are allocated to the FSS;
- d)* that some administrations have already deployed, and plan to expand their use of, ESIMs with operational and future FSS GSO networks and non-GSO systems;
- e)* that the space stations mentioned in *considering c)* in the frequency bands mentioned in *considering a)* are required to be coordinated and notified in accordance with the provisions of Articles 9 and 11;
- f)* that the frequency bands in *considering a)* are also allocated to several other services on a primary basis, the allocated services are used by a variety of different systems in many administrations, and these existing services and their future development should be protected without undue constraints;
- g)* the need to encourage the development and implementation of new technologies in the FSS at frequencies above 30 GHz;
- h)* that advances in technology, including the use of tracking techniques, allow ESIMs to operate within the characteristics of fixed earth stations of the FSS;
- i)* that the operation of ESIMs within the territory, including territorial waters and territorial airspace, of an administration shall be carried out only if authorized by that administration,

*noting*

- a) that Article **21** contains power flux-density (pfd) limits for the space stations mentioned in *considering c*);
- b) that WRC-15 adopted No. **5.527A** and Resolution **156 (WRC-15)\*** with respect to ESIMs communicating with GSO FSS networks in the frequency bands 19.7-20.2 GHz and 29.5-30.0 GHz;
- c) that WRC-19 adopted No. **5.517A** and Resolution **169 (WRC-19)\*\*** with respect to ESIMs communicating with GSO FSS networks in the frequency bands 17.7-19.7 GHz and 27.5-29.5 GHz;
- d) that this conference has adopted Resolution **121 (WRC-23)** with respect to aeronautical ESIMs (A-ESIMs) and maritime ESIMs (M-ESIMs) communicating with GSO space stations in the FSS in the frequency band 12.75-13.25 GHz;
- e) that the ESIMs addressed by this Resolution are not to be used for safety-of-life applications;
- f) that the frequency band 48.2-50.2 GHz (Earth-to-space) in Region 2 is identified for use by high-density applications in the FSS (No. **5.516B**);
- g) that the provisions of No. **5.550B** apply;
- h) that administrations are urged to take all practicable steps to reserve the frequency band 47.2-49.2 GHz for feeder links for the broadcasting-satellite service (BSS) operating in the frequency band 40.5-42.5 GHz (No. **5.552**);
- i) that the use of the frequency bands 47.5-47.9 GHz, 48.2-48.54 GHz and 49.44-50.2 GHz by the FSS (space-to-Earth) is limited to GSO satellites (No. **5.554A**);
- j) that the pfd in the frequency band 48.94-49.04 GHz produced by any GSO space station in the FSS (space-to-Earth) operating in the frequency bands 48.2-48.54 GHz and 49.44-50.2 GHz shall not exceed  $-151.8$  dB(W/m<sup>2</sup>) in any 500 kHz band at the site of any radio astronomy station (No. **5.555B**);
- k) that the frequency band 48.94-49.04 GHz is also allocated to the radio astronomy service (RAS) on a primary basis (No. **5.555**);
- l) that, in the frequency bands 49.7-50.2 GHz, 50.4-50.9 GHz and 51.4-52.6 GHz, Resolution **750 (Rev.WRC-19)** applies, and Nos. **5.338A**, **5.340** and **5.340.1**, among other provisions of the Radio Regulations, apply;
- m) that the fixed and mobile services are allocated on a primary basis in the frequency band 48.2-50.2 GHz on a global basis;
- n) that the frequency band 50.2-50.4 GHz is allocated on a primary basis to the Earth exploration-satellite service (EESS) (passive) and space research service (SRS) (passive);
- o) that the RAS is extremely susceptible to interference from space and airborne transmitters (see No. **29.12**);

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\* *Note by the Secretariat:* This Resolution was revised by WRC-23.

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p) that in the frequency band 48.94-49.04 GHz, administrations are urged to take all practicable steps to protect the RAS from harmful interference, in accordance with No. 5.149,

*recognizing*

a) that the protection of the primary incumbent services in these frequency bands should be studied;

b) that the authorization of land ESIMs remains the prerogative of each administration and, as such, it is not within the scope of this Resolution;

c) that the frequency bands used for reception by A-ESIMs and M-ESIMs shall not impose constraints on other allocated services or claim protection from allocated services operating in accordance with the Radio Regulations,

*resolves to invite the ITU Radiocommunication Sector to complete in time for the 2027 world radiocommunication conference*

1 studies on the spectrum needs and technical and operational characteristics of A-ESIMs and M-ESIMs that plan to operate within FSS allocations in the frequency bands mentioned in *considering a)*, or parts thereof;

2 studies on sharing and compatibility between A-ESIMs and M-ESIMs communicating with space stations in the FSS in the frequency bands mentioned in *considering a)*, or parts thereof, and the stations of primary services allocated in these frequency bands and in adjacent frequency bands, including passive services in adjacent and near-adjacent frequency bands, in order to ensure protection of, and not impose undue constraints on, those services;

3 the development, for M-ESIMs and A-ESIMs, of the technical conditions for their operation, taking into account the results of the studies above;

4 the development, for M-ESIMs and A-ESIMs communicating with GSO networks and non-GSO systems, of regulatory provisions for their operation, taking into account the results of the studies above;

5 consideration of the results of studies within the ITU Radiocommunication Sector (ITU-R) for the development of a new Recommendation for the network control and monitoring centre for ESIM operations;

6 studies on the responsibility of the administrations involved in the operations of the A-ESIMs and M-ESIMs addressed by this Resolution,

*invites the 2027 world radiocommunication conference*

to consider the results of the above studies and take the necessary actions for GSO and non-GSO ESIMs, as appropriate, provided that the results of the studies referred to in *resolves to invite the ITU Radiocommunication Sector to complete in time for the 2027 world radiocommunication conference* are complete and agreed by the ITU-R study groups.