

## RESOLUTION 741 (REV.WRC-15)

**Protection of the radio astronomy service in the frequency band  
4 990-5 000 MHz from unwanted emissions of the radionavigation-satellite  
service (space-to-Earth) operating in the frequency band 5 010-5 030 MHz**

The World Radiocommunication Conference (Geneva, 2015),

*considering*

- a)* that unwanted emissions from space stations of the radionavigation-satellite service (RNSS) operating in the frequency band 5 010-5 030 MHz may cause interference to the radio astronomy service (RAS) in the frequency band 4 990-5 000 MHz;
- b)* that WRC-2000 decided to introduce a provisional power flux-density (pfd) limit in the frequency band 4 990-5 000 MHz to protect the RAS, and invited ITU-R to conduct studies to review this limit;
- c)* that protection requirements for the RAS are given in Recommendations ITU-R RA.769 and ITU-R RA.1513, and are different for geostationary (GSO) and non-GSO satellite systems,

*noting*

- a)* that Recommendation ITU-R M.1583 provides a methodology based on the equivalent pfd (epfd) concept for calculation of interference resulting from unwanted emissions from non-GSO systems of the mobile-satellite service or RNSS into radio astronomy stations;
- b)* that Recommendation ITU-R RA.1631 provides antenna patterns and maximum antenna gain to be used for compatibility analyses between non-GSO systems and RAS stations based on the epfd concept;
- c)* that Recommendation ITU-R RA.1513 recommends acceptable levels of data loss to radio astronomy observations, stating in particular that the percentage of data loss caused by any system should be lower than 2%;
- d)* that as from the end of WRC-03, the Radiocommunication Bureau reviewed all RNSS systems for which complete coordination or notification information, as appropriate, had been received for the frequency band 5 010-5 030 MHz, and revised its findings regarding compliance with No. **5.443B**, taking into account additional information received under *resolves* 4,

*resolves*

- 1 that in order not to cause harmful interference to the RAS in the frequency band 4 990-5 000 MHz, the pfd produced in this frequency band by any GSO RNSS network operating in the 5 010-5 030 MHz frequency band shall not exceed  $-171$  dB(W/m<sup>2</sup>) in a 10 MHz frequency band at any radio astronomy station;

## RES741-2

2 that in order not to cause harmful interference to the RAS in the frequency band 4 990-5 000 MHz, over the whole sky, for elevations higher than the minimum operating elevation angle  $\theta_{min}$ <sup>1</sup> specified for the radio telescope, the epfd produced in this frequency band by all space stations within any non-GSO RNSS system operating in the 5 010-5 030 MHz frequency band shall not exceed  $-245$  dB(W/m<sup>2</sup>) in a 10 MHz frequency band at any radio astronomy station for more than 2% of the time, using the methodology in Recommendation ITU-R M.1583-1 and a reference antenna with a radiation pattern and maximum antenna gain given in Recommendation ITU-R RA.1631-0;

3 that the limits referred to in *resolves* 1 and 2 shall apply to RNSS systems as from 3 June 2000;

4 that administrations planning to operate a GSO or a non-GSO RNSS system in the frequency band 5 010-5 030 MHz, for which complete coordination or notification information, as appropriate, has been received by the Bureau after 2 June 2000, shall send to the Bureau the value of the maximum level of pfd as referred to in *resolves* 1 or the value of the maximum level of epfd as referred to in *resolves* 2, as appropriate.

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<sup>1</sup> Until adoption of a definition of  $\theta_{min}$  by ITU-R, and publication of notified radio astronomy observatory data, a value of 5° should be assumed in appropriate calculations.