question itu-r 293/4

Antenna radiation diagrams/patterns for small (D/λ[[1]](#footnote-1) around 30) earth station antennas used in fixed-satellite and broadcasting-satellite systems

(2015)

The ITU Radiocommunication Assembly,

*considering*

*a)* that earth station reference antenna patterns for the fixed-satellite service (FSS) and the broadcasting-satellite service (BSS) are used in determination of coordination requirements in accordance with the Radio Regulations;

*b)* that the identification of coordination requirements and/or interference assessments between FSS/BSS networks, as well as between FSS/BSS earth stations and systems of other services sharing the same frequency band, depends on the reference antenna patterns used in analysis;

*c)* that use of unnecessarily conservative reference antenna patterns can lead to an increase in the number of networks identified as potentially affected and thereby make it difficult for the involved administrations to complete coordination;

*d)* that the range of applicability of current and future reference antenna patterns needs to be precisely defined (i.e. the applicable range of input parameters, the applicable frequency bands, etc.);

*e)* that the definition of both antenna patterns and their associated range of applicability needs to be based on measurements;

*f)* that new antenna design and technology (e.g. non‑circular reflectors, special feed horn design) could lead to lower side lobe levels than in the current reference antenna patterns;

*g)* that the new antenna technology such as phased arrays may also be taken into account in the development of new antenna patterns;

*h)* that the ITU Radiocommunication Bureau has developed an antenna pattern software library used in conjunction with all software used in the application of the relevant procedures of the Radio Regulations,

*noting*

*a)* that there are some FSS/BSS earth stations antenna patterns in existing ITU-R Recommendations as for example ITU‑R S.465, ITU-R S.580, ITU-R BO.1213, ITU-R S.1855 that are used for antenna size D/λ around 30;

*b)* that identification for the need of coordination in BR IFIC special sections in many cases refer to satellite networks at very distant positions because of the comparatively high side lobe levels of the FSS/BSS earth stations reference antenna patterns especially at off-axis angles beyond 40 degrees,

*decides* that the following Questions should be studied

1 What are the measured radiation characteristics of small FSS/BSS earth station antennas especially in the vicinity of the off-axis angles of 40 degrees and beyond?

2 What are the reference patterns applicable to FSS/BSS earth station antennas with D/λ around 30?

3 What range of applicability could be associated with any new FSS/BSS reference antenna pattern (frequency bands, antenna diameter, etc.)?

4 Can the range of applicability of existing FSS/BSS reference antenna patterns be extended to small antennas?

5 How could the existing or new small (D/λ around 30) earth station antenna patterns be improved/developed taking into account the recent technological development including the phased array antennas and the measured antenna diagrams?

6 What are the necessary parameters to implement reference antenna patterns in software tools developed by the ITU Radiocommunication Bureau?

 *further decides*

1 that the results of the above studies should be included in appropriate Recommendations and/or Reports;

2that the above studies should be completed by 2023.

Category: S2

1. D is the antenna dimension in the measurement plane (m), λ is the wavelength (m). [↑](#footnote-ref-1)