

ITU-R

Radiocommunication Sector of ITU

**Recommendation ITU-R S.1855
(01/2010)**

**Alternative reference radiation pattern for
earth station antennas used with satellites
in the geostationary-satellite orbit for use
in coordination and/or interference
assessment in the frequency range
from 2 to 31 GHz**

**S Series
Fixed-satellite service**



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Foreword

The role of the Radiocommunication Sector is to ensure the rational, equitable, efficient and economical use of the radio-frequency spectrum by all radiocommunication services, including satellite services, and carry out studies without limit of frequency range on the basis of which Recommendations are adopted.

The regulatory and policy functions of the Radiocommunication Sector are performed by World and Regional Radiocommunication Conferences and Radiocommunication Assemblies supported by Study Groups.

Policy on Intellectual Property Right (IPR)

ITU-R policy on IPR is described in the Common Patent Policy for ITU-T/ITU-R/ISO/IEC referenced in Annex 1 of Resolution ITU-R 1. Forms to be used for the submission of patent statements and licensing declarations by patent holders are available from <http://www.itu.int/ITU-R/go/patents/en> where the Guidelines for Implementation of the Common Patent Policy for ITU-T/ITU-R/ISO/IEC and the ITU-R patent information database can also be found.

Series of ITU-R Recommendations

(Also available online at <http://www.itu.int/publ/R-REC/en>)

Series	Title
BO	Satellite delivery
BR	Recording for production, archival and play-out; film for television
BS	Broadcasting service (sound)
BT	Broadcasting service (television)
F	Fixed service
M	Mobile, radiodetermination, amateur and related satellite services
P	Radiowave propagation
RA	Radio astronomy
RS	Remote sensing systems
S	Fixed-satellite service
SA	Space applications and meteorology
SF	Frequency sharing and coordination between fixed-satellite and fixed service systems
SM	Spectrum management
SNG	Satellite news gathering
TF	Time signals and frequency standards emissions
V	Vocabulary and related subjects

Note: This ITU-R Recommendation was approved in English under the procedure detailed in Resolution ITU-R 1.

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RECOMMENDATION ITU-R S.1855

Alternative* reference radiation pattern for earth station antennas used with satellites in the geostationary-satellite orbit for use in coordination and/or interference assessment in the frequency range from 2 to 31 GHz

(2010)

Scope

This Recommendation provides alternative reference radiation patterns to the ones given in Recommendation ITU-R S.465 which may be used for both circular and non-circular earth station antennas used with satellites in the geostationary-satellite orbit (GSO) and which, in the absence of particular information concerning the radiation pattern, may be used for coordination and/or interference assessment between earth stations in the fixed-satellite service (FSS) and stations of other services sharing the same frequency band as well as coordination and/or interference assessment between systems in the FSS.

The ITU Radiocommunication Assembly,

considering

- a) that, for coordination and for the assessment of mutual interference between radiocommunication-satellite systems and between earth stations of such systems and stations of other services sharing the same frequency band, it is convenient to use a commonly agreed upon radiation pattern that is met by most antennas for the earth station antenna;
- b) that, for the determination of coordination distance and for the assessment of interference between earth and terrestrial stations, a radiation pattern based on the level met by all but a small percentage of the side-lobe peaks may be appropriate;
- c) that, for coordination and for the assessment of interference between earth stations and space stations, a radiation pattern for the region near the main beam based on the envelope of the peak gain of the side lobes in this region may be appropriate;
- d) that, at angles relative to the axis of the main beam where effects peculiar to the particular feed system used do not contribute appreciably to the gain in the side lobes, the radiation patterns for numerous existing earth station antennas show only moderate scatter about a simple generalized radiation pattern, at least within the frequency range from 2 to 31 GHz;
- e) that, for antennas of the Cassegrain type over the range of angles relative to the axis of the main beam where contributions to the side-lobe gain occur primarily as a result of spill-over, the patterns of a number of existing antennas also show reasonable agreement;
- f) that, at large off-boresight axis angles, the likelihood of local ground reflections needs to be considered;
- g) that the use of antennas with the best achievable radiation patterns will contribute to a more efficient use of the radio-frequency spectrum and the geostationary-satellite orbit (GSO);

* This Recommendation provides an alternative reference radiation pattern to be considered in those cases where use of this reference pattern results in improved sharing conditions, as compared to Recommendation ITU-R S.465 which also addresses reference earth station radiation pattern for use in coordination and/or interference assessment. See also *noting* c).