

Recommendation ITU-R S.2158-0

(09/2023)

S Series: Fixed-satellite service

Methodology for examining the compliance of an aeronautical earth station in motion communicating with geostationary space stations in the fixed-satellite service in the 27.5-29.5 GHz band with a set of pre-established pfd limits on the Earth's surface

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 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 <https://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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**Methodology for examining the compliance of an aeronautical earth station
in motion communicating with geostationary space stations
in the fixed-satellite service in the 27.5-29.5 GHz band with a set of
pre-established pfd limits on the Earth's surface**

(2023)

Scope

This Recommendation provides a methodology for use by the ITU Radiocommunication Bureau to conduct examination of the characteristics of an aeronautical earth station in motion (A-ESIM) operating with geostationary satellite networks with respect to conformity with power flux-density limits specified in Part II, Annex 3 of Resolution **169 (WRC-19)** of the Radio Regulations.

Keywords

Aeronautical ESIM, A-ESIM, GSO, pfd, methodology

Abbreviations/Glossary

A-ESIM Aeronautical earth station in motion

GSO Geostationary orbit

Related ITU Recommendations, Reports

Recommendation ITU-R P.676 – Attenuation by atmospheric gases and related effects

Report ITU-R M.2221 – Feasibility of MSS operations in certain frequency bands

The ITU Radiocommunication Assembly,

considering

- a) that WRC-19 adopted, in Resolution **169 (WRC-19)** of the Radio Regulations (RR), the power flux-density (pfd) limits applicable to aeronautical earth station in motion (A-ESIM) communicating with geostationary space stations in the fixed-satellite service (FSS) systems in the frequency range 27.5-29.5 GHz in order to ensure the protection of terrestrial services;
- b) that in accordance with *resolves* 1.2.5 of Resolution **169 (WRC-19)**, the Bureau shall examine the characteristics of A-ESIM communicating with GSO FSS satellites with respect to conformity with pfd limits on the Earth's surface as specified in Part II of Annex 3 of Resolution **169 (WRC-19)** and publish the results of such examination in the BR IFIC;
- c) that in the absence of an appropriate methodology, the Bureau is unable to examine the conformity specified in *considering b)*;
- d) that, in Resolution **169 (WRC-19)**, WRC-19 invited the ITU-R to conduct relevant studies to determine a methodology with respect to the examination referred to in *considering b)*,

recognizing

that *resolves* 1.2.4 of Resolution **169 (WRC-19)** stipulates that “the provisions in this Resolution, including Annex 3, set the conditions for the purpose of protecting terrestrial services from unacceptable interference from aeronautical and maritime ESIMs in neighbouring countries in the frequency band 27.5-29.5 GHz; however, the requirement not to cause unacceptable interference to,