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# IEEE Standard Definitions of Terms for Radio Wave Propagation

IEEE Antennas and Propagation Society

Sponsored by the
Antennas and Propagation Standards Committee

IEEE
3 Park Avenue
New York, NY 10016-5997
USA

**IEEE Std 211™-2018**
(Revision of IEEE Std 211-1997)

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# IEEE Standard Definitions of Terms for Radio Wave Propagation

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Approved 23 October 2018

**IEEE-SA Standards Board**

**Abstract:** Terms and definitions used in the context of electromagnetic wave propagation relating to the fields of telecommunications, remote sensing, radio astronomy, optical waves, plasma waves, the ionosphere, the magnetosphere, and magnetohydrodynamic, acoustic, and electrostatic waves are supplied.

**Keywords:** electromagnetic wave propagation, IEEE 211™, terminology



The Institute of Electrical and Electronics Engineers, Inc.
3 Park Avenue, New York, NY 10016-5997, USA



PDF: ISBN 978-1-5044-5331-8 STD23427
Print: ISBN 978-1-5044-5332-5 STDPD23427

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Everett Farr
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Noriyuki Ikeuchi
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Donald McPherson
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Eric Mokole
Vikass Monebhurrun
Jeffrey Nanz[illegible]
Michael [illegible]ewki[illegible]
Julian [illegible]ir
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[illegible]ker Struppler
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## Introduction

This introduction is not part of IEEE Std 211-2018, IEEE Standard Definitions of Terms for Radio Wave Propagation.

This is the fourth revision of the original IEEE Std 211™-1969, following those of 1977, 1990, and 1997. It is indeed true, as noted in previous Introductions, that the "need for revising a definitions standard transcends its publication date and is essentially continuous." Therefore, as this standard goes to print, work on the fifth revision is already in progress, consisting of adding new terms, refining or deleting old ones, and improving the overall consistency of the standard. This voluntary effort is carried out by the Antennas and Propagation Standards Committee (APS/SC) Subcommittee on Definitions of Terms for Radio Wave Propagation (WG_ P211), which meets once a year at the conference sponsored by the IEEE Antennas and Propagation Socie[illegible] Increasingly, the face to face meeting has been replaced by regular e-mails and conference calls, expanding the opportunity for international participation. The chair of the Subcommittee presenting this revision is Vikas Monebhurrun, who was preceded by David Thiel, who took over from Wolfhard J. Vogel, who took the baton from George H. Hagn, who in turn was preceded by chairs John M. Kelso, C. H. Liu, and Kurt [illegible]man. The individuals with primary responsibility for this fourth revision, as well as those who contributed or made useful comments, are acknowledged below. An invitation is extended to the users of this standard to contribute to the fifth revision whenever they see deficiencies or have ideas for an improvement by communicating with the APS/SC chair via e-mail to vikass.monebhurrun@centralesupelec.fr.

Within the IEEE, the work has been coordinated with the Antennas and Propagation Standards Committee (APS/SC). For the previous revision, it had involved the following societies: EMC, COM, and Instrumentation and Measurements. It was then also coordinated with Study Groups [illegible], 5, and 6 of the International Telecommunication Union (ITU-R) and the U. S. National Body of the International Electrotechnical Commission (IEC).

The fields covered by this standard include the following where pertinent to electromagnetic wave propagation: radio astronomy, optical waves, plasma waves, ionosphere, magnetosphere, and magnetohydrodynamic, acoustic, and electrostatic waves.

## Contents

# IEEE Standard Definitions of Terms for Radio Wave Propagation

## 1. Scope

The standard provides terms and definitions used in the context of electromagnetic wave propagation relating to the fields of telecommunications, sensing, astronomy, optical waves, plasma waves, the ionosphere, the magnetosphere, and magnetohydrodynamic, acoustic, and electrostatic waves. Some obsolete terms and definitions will be removed. The language used for some already existing terms will be refined. The standard will also include some additional terms that are commonly accepted in these fields.

## 2. Normative references

The following referenced documents are indispensable for the application of this document (i.e., they must be understood and used, so each referenced document is cited in text and its relationship to this document is explained). For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments or corrigenda) applies.

IEEE Std 145™-2013, IEEE Standard for Definitions of Terms for Antennas.[1,2]

## 3. Definitions

The $e^{j\omega t}$ convention is used throughout this document, where $j^2 = -1$, $\omega$ is the radian frequency, and $t$ is time. For the purposes of this document, the following terms and definitions apply. The *IEEE Standards Dictionary Online* should be consulted for terms not defined in this clause.[3]

NOTE—The terms defined in IEEE Std 211-2018 should be considered before applying the definitions in IEEE Std 145™-2013.[4,5]

**absorption**: The process of converting electromagnetic energy to heat.

**absorption band**: A band of frequencies for which a medium is considered to be absorbing.

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