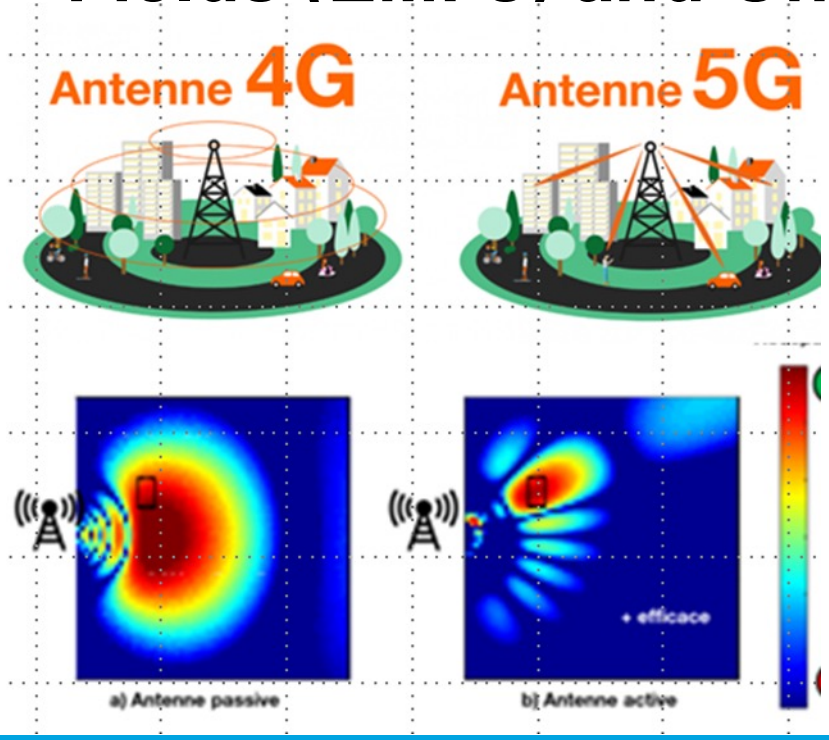
ITU Regional Workshop on EMF harmony: Balancing connectivity and safety in the Arab region

Overview of ITU's activities on Human Exposure to Electromagnetic Fields (EMFs) and Ongoing EMF Standardization Efforts



Dr. Fryderyk Lewicki
Chairman of Working Party 1
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Orange Polska, Poland

orange™

Orange Expert
Energy
& Environment

ITU

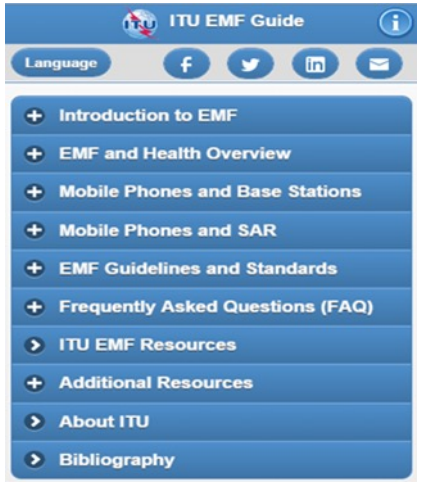
ITU-T Q3/5 Human Exposure to EMF from Digital Technologies – ITU Resolutions

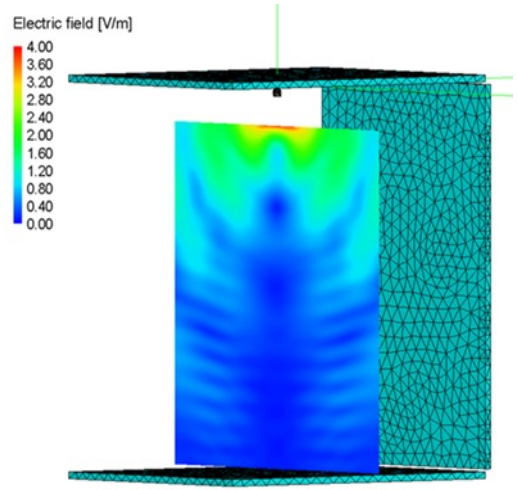
- ITU PP Resolution 176 - "Measurement and assessment concerns related to human exposure to electromagnetic fields"
- WTSA Resolution 72 - "Measurement concerns related to human exposure to electromagnetic fields"
- WTDC Resolution 62 - "Assessment and measurement of human exposure to electromagnetic fields"

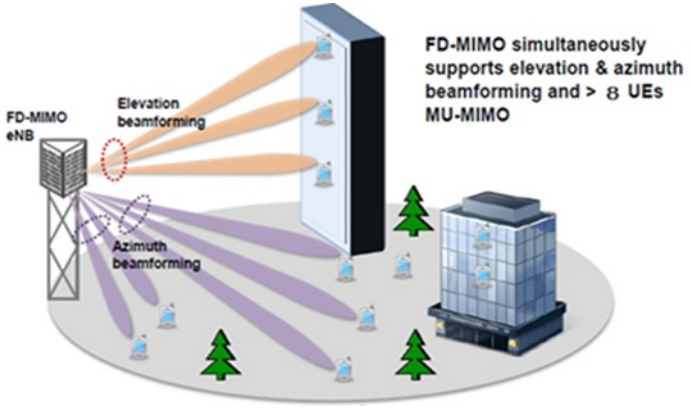
ITU-T Q3/5 – Current deliverables

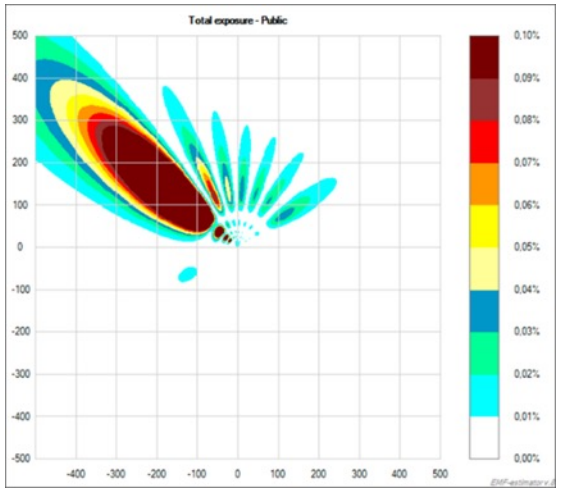
- 12 Recommendations: (ITU-T K.52, K.61, K.70, K.90, **K.91**, K.83, K.100, K.113, K121, K.122, K.145, K.153)
- 10 Supplements: (ITU-T K.Suppl. 1, 4, 9, 13, 14, 16, 19, 20, 29 and 32) and 1 Technical Report
- 2 mobile applications
- 5 Software packages

https://www.itu.int/en/ITU-T/studygroups/2022-2024/05/Pages/default.aspx









Recommendation ITU-T K.91 – basic RF EMF Document in ITU-T

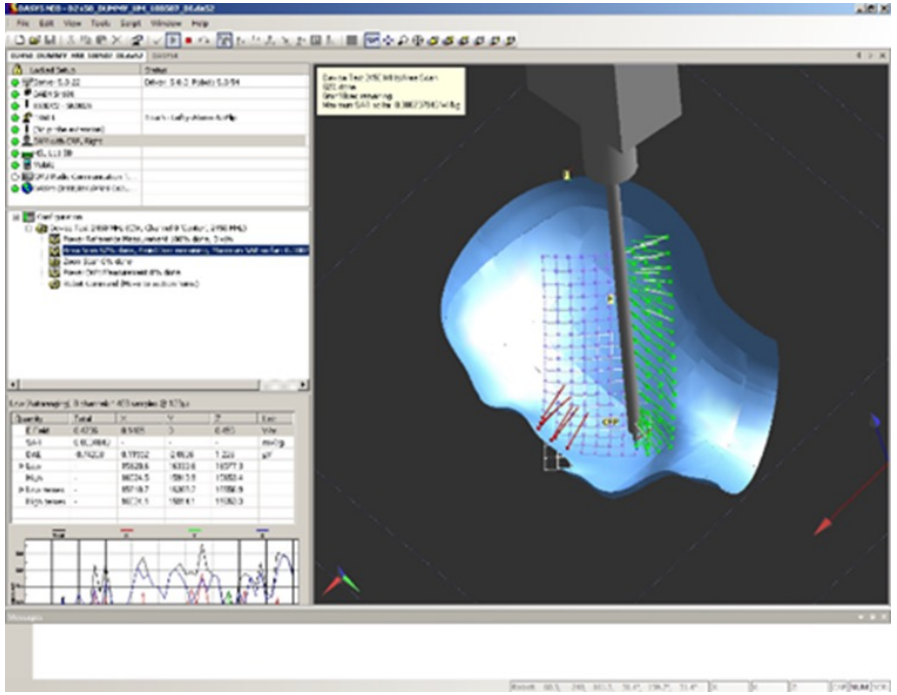
Guidance for assessment, evaluation and monitoring of human exposure to radio frequency electromagnetic fields

- There are plenty of standards concerning human exposure assessment
- Most of the standards are very general or product oriented
- In real environment there are many sources of radiation operating simultaneously
- Recommendation ITU-T K.91 gives guidance on the all issues concerning RF EMF including references to other ITU documents and other international standards

Recommendation ITU-T K.devices

RF EMF exposure assessment of the wireless radiocommunication devices operating close to the human body

The purpose of this Recommendation is to have proper information concerning RF EMF exposure limits in the close proximity of the human body.

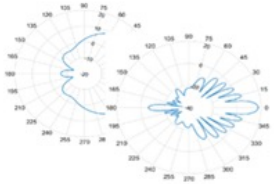


Recommendation ITU-T K.AI&EMF

EMF evaluation method using artificial intelligence in vicinity of 5G NR (IMT-2020) base station

The purpose of this Recommendation is to use advantages of the Artificial Intelligence in the assessmen of the human exposure to RF EMF in the vicinity of radio base stations

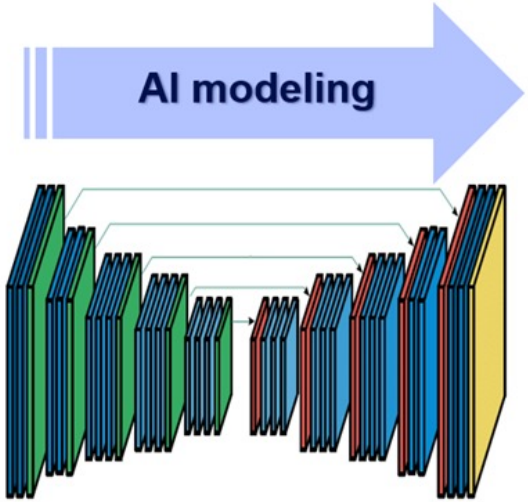
GIS data

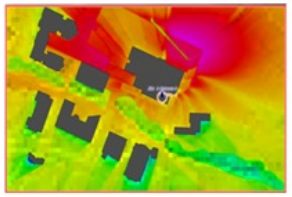


Antenna radiation pattern

Longitude	Latitude
Altitude	PCI
Distance	

Numeric data





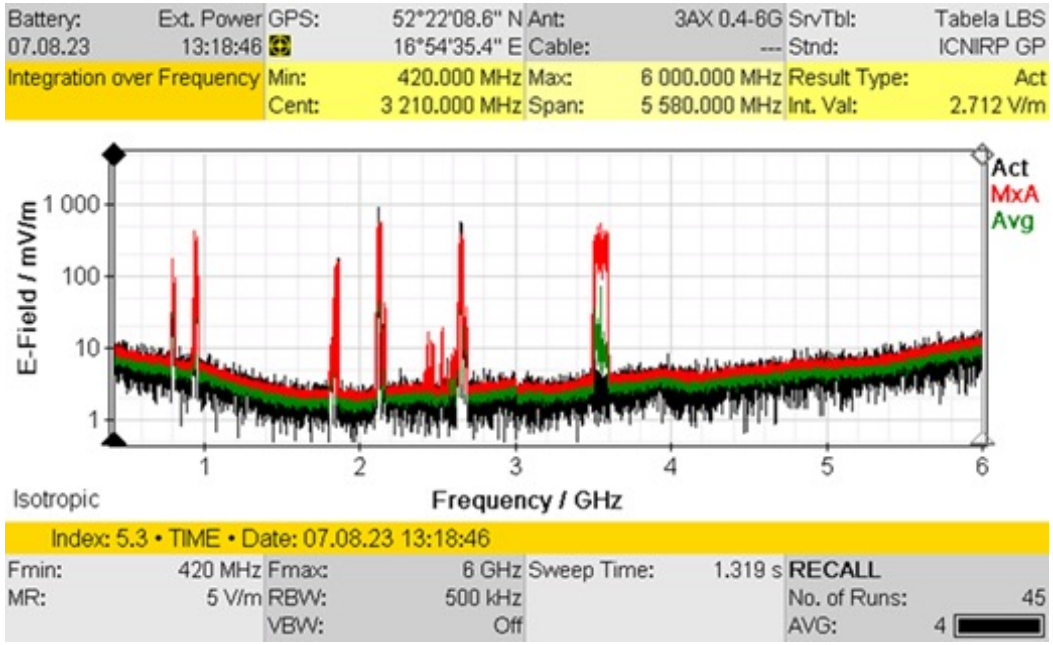
Field strength

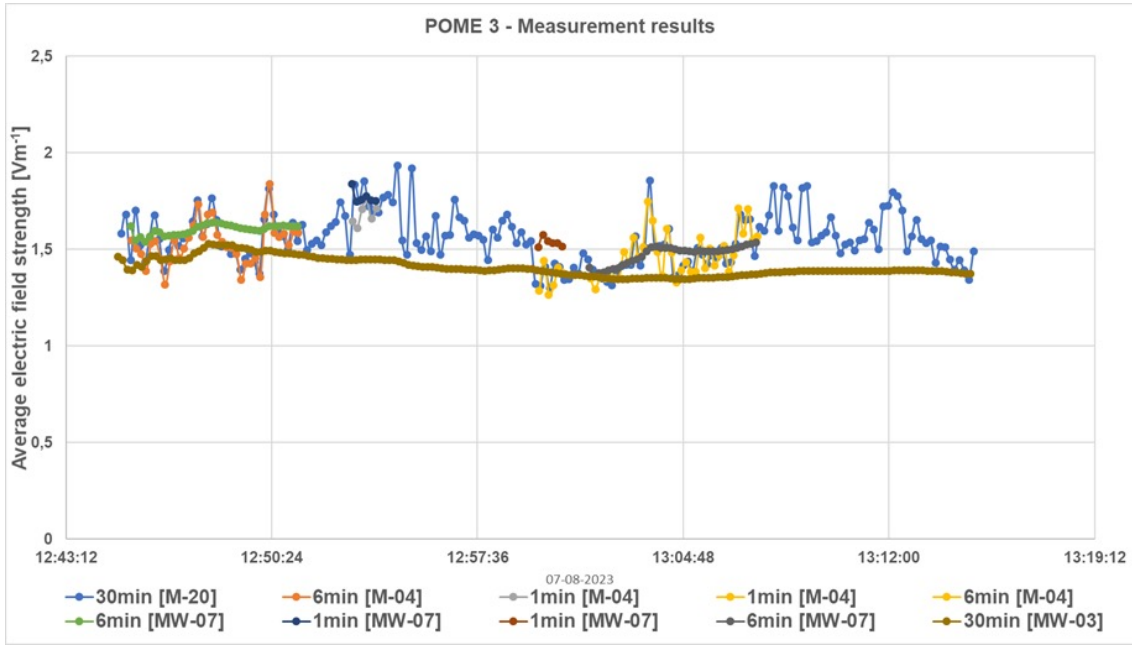
Recommendation ITU-T K. K.peak

Comparison between peak and real exposure in the long-term considerations

Time and spatial averaging in RF-EMF exposure assessment

The purpose of this Recommendation is to give guidance as concerning time and spatial averaging used during RF EMF measurements

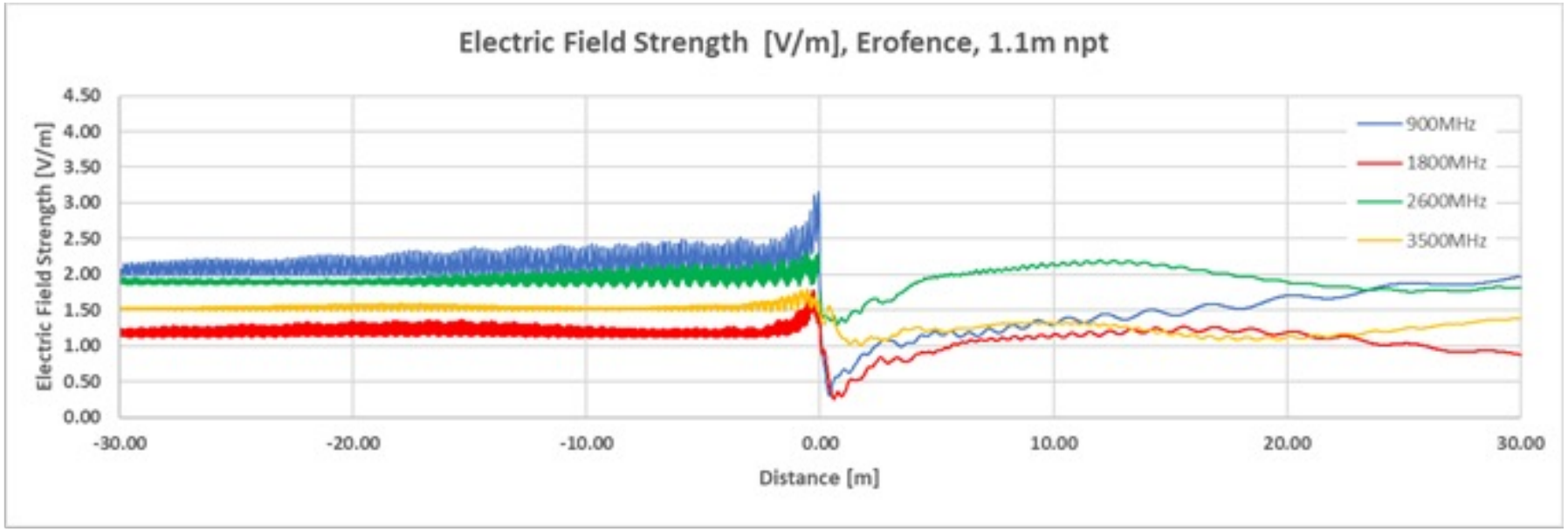


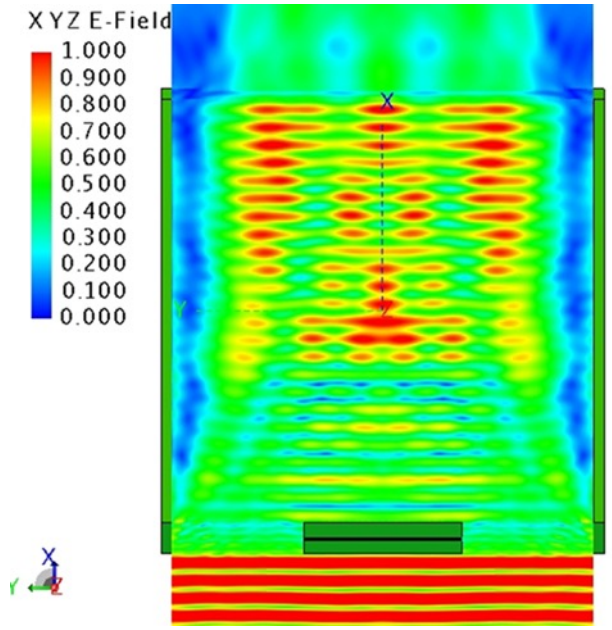


Recommendation ITU-T K. K.reflections

Impact of the metallic structures for the EMF exposure level

The purpose of this Recommendation is to deliver proper information concerning the influence of the metallic object for the results of RF-EMF measurements





Recommendation ITU-T K. K.Suppl. MethDataEMF

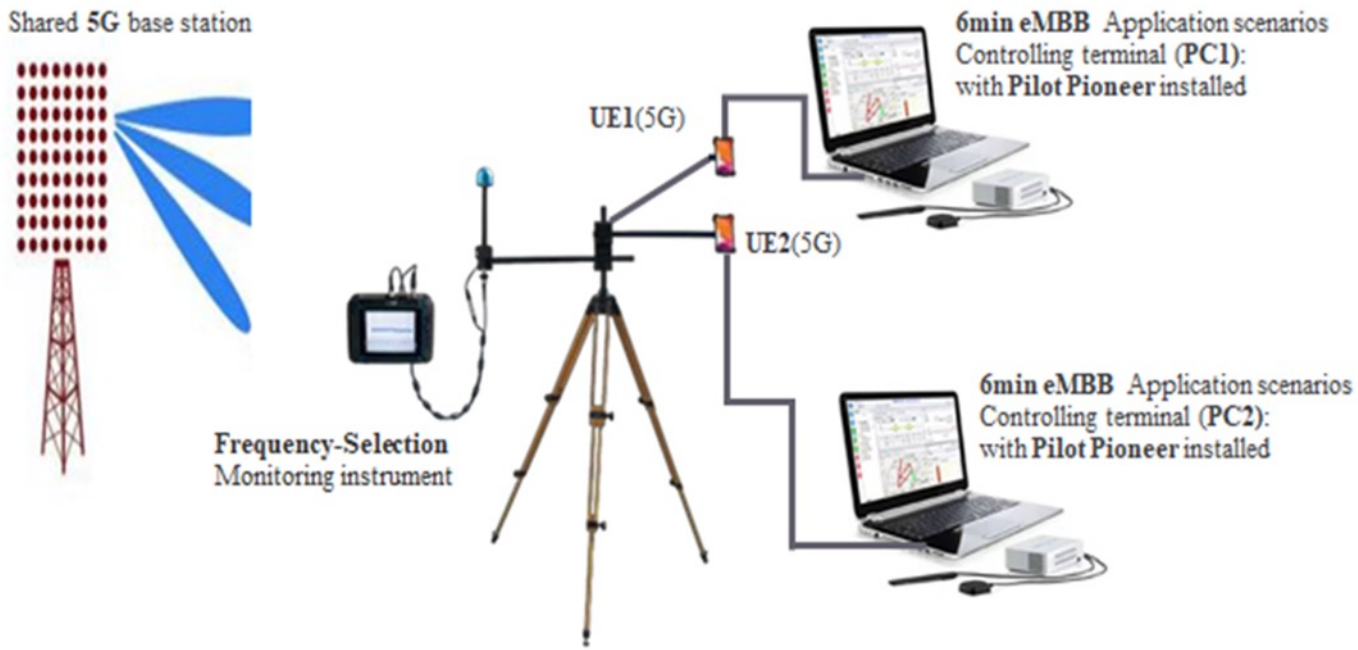
Guidance on Methodologies for RF-EMF Assessments and Responding to Public Concerns regarding human exposure to RF-EMF from Telecommunication Installations

- It will provide comprehensive guidance to ITU member countries seeking to conduct RF-EMF assessments with the use of ITU-T Recommendations or Supplements and other international technical standards (e.g., IEC)
- Development of a framework for harmonized RF-EMF assessment methodologies to EMF measurement and assessments of telecommunication installations (such as cellular and broadcasting).
- Propose development of a format for data collection and sharing of the results of RF-EMF assessments to allow comparability between countries and analysis
- Furthermore, it will develop guidance on addressing public concerns and misconceptions related to RF-EMF exposure from telecom installations

ITU-T K. K.Suppl.32

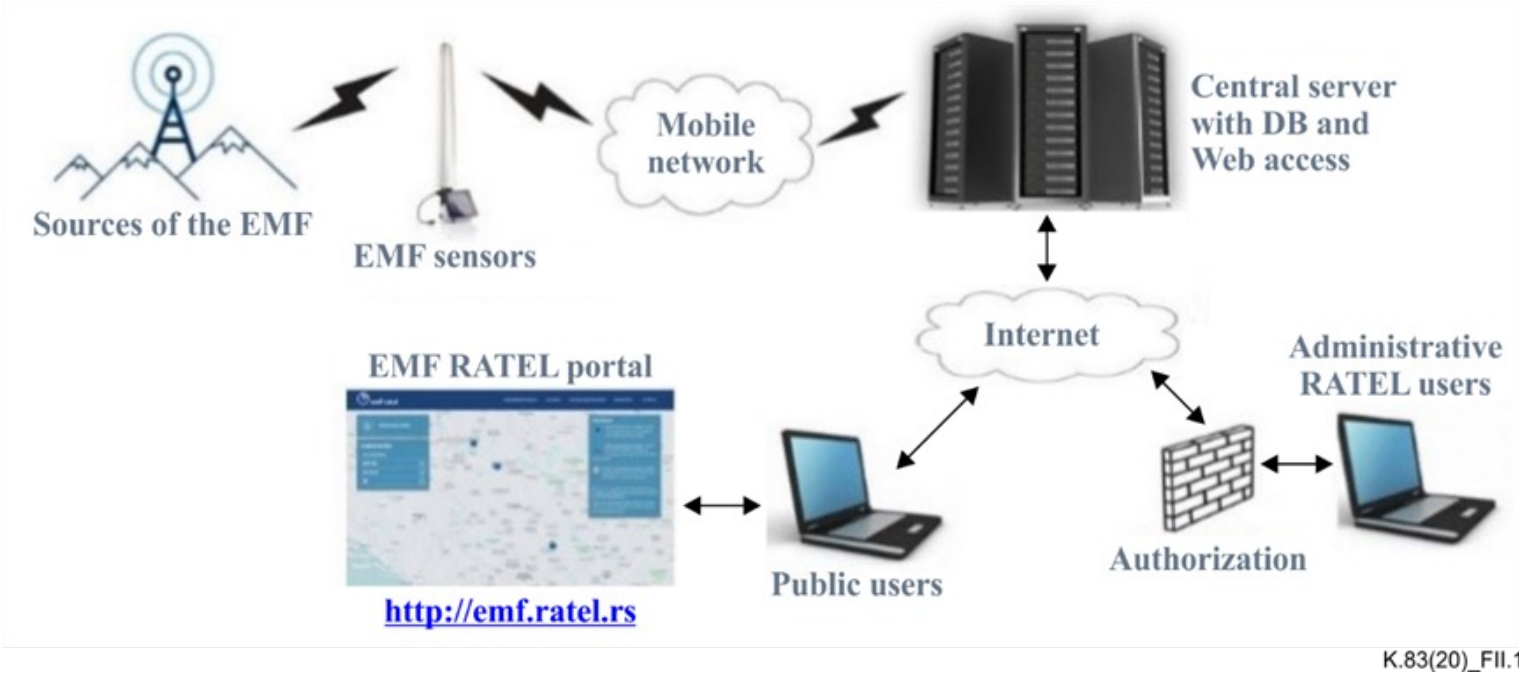
Case studies of radio frequency - electromagnetic field (RF-EMF) assessment

This informative document is under constant update as it include information collected from different entities concerning RF EMF measurements mainly because of specific of 5G systems and beamforming antennas

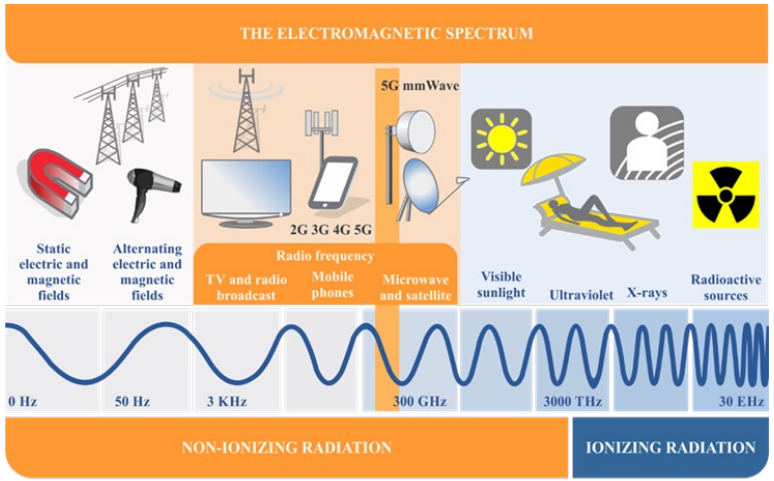


Recommendation ITU-T K.83
Monitoring of electromagnetic field levels

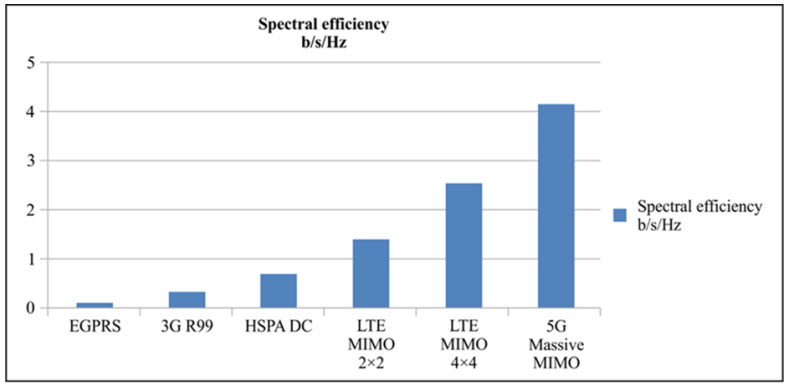
This Recommendation is under constant update as it include information collected from different countries and entities concerning RF EMF monitoring systems and in sharing proper information to the general public



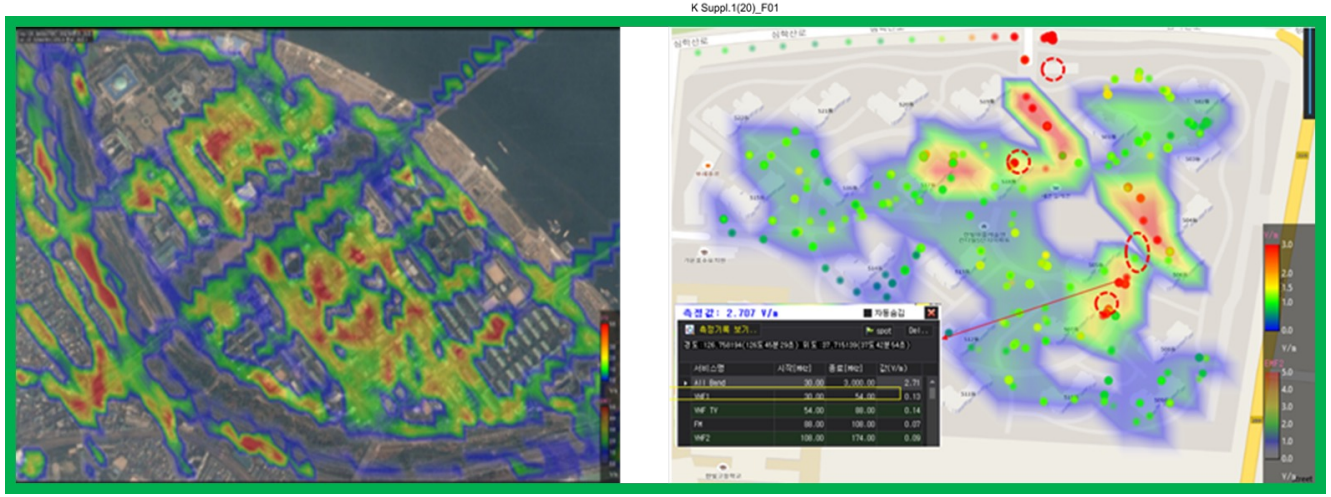
Examples from other ITU-T Recommendations

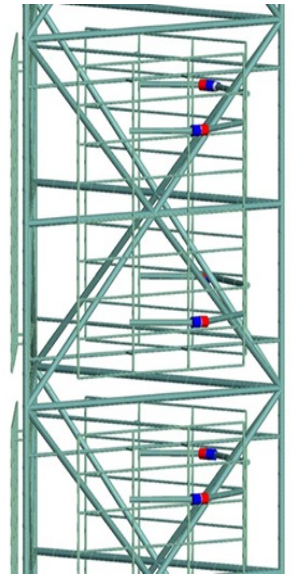


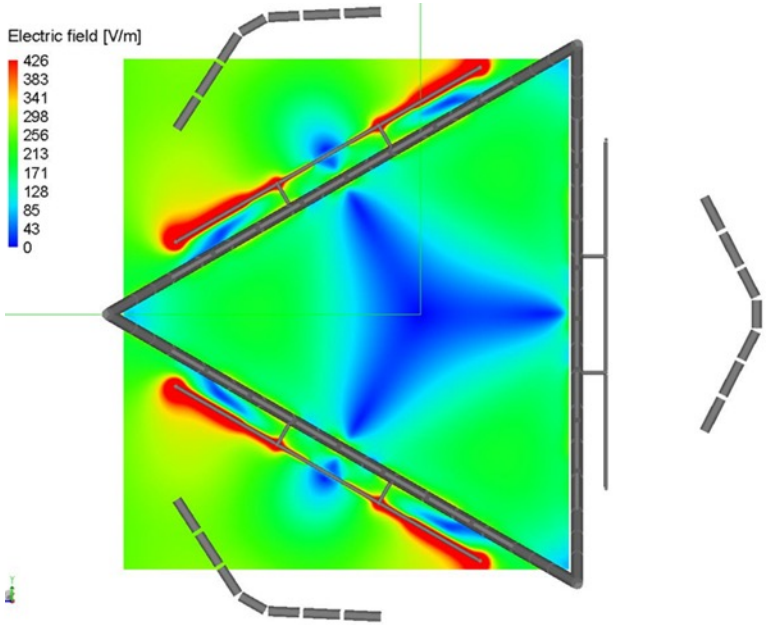
K Suppl.1(20)_F01



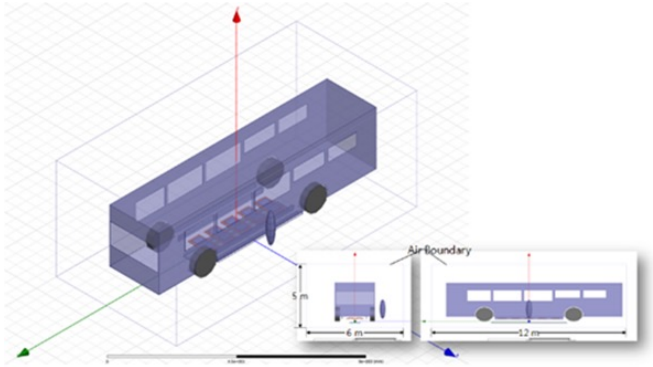
K Suppl.13(18)_F03



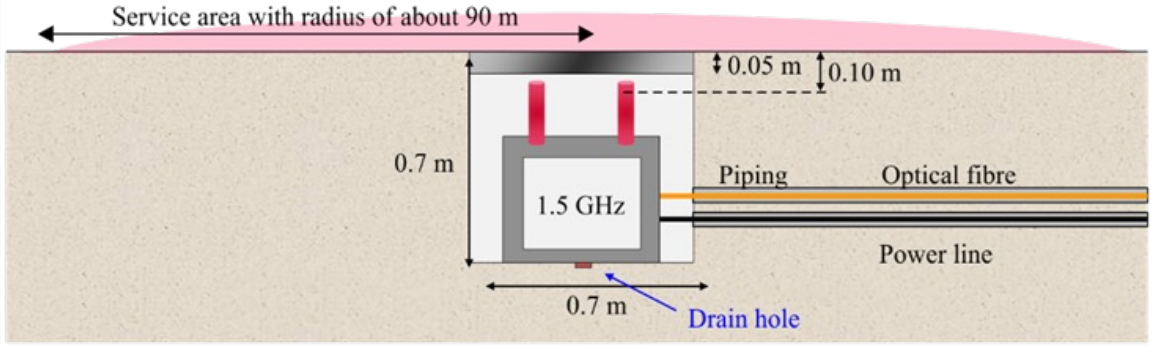




Q3/5 Informative documents: ITU-T Supplements & Reports

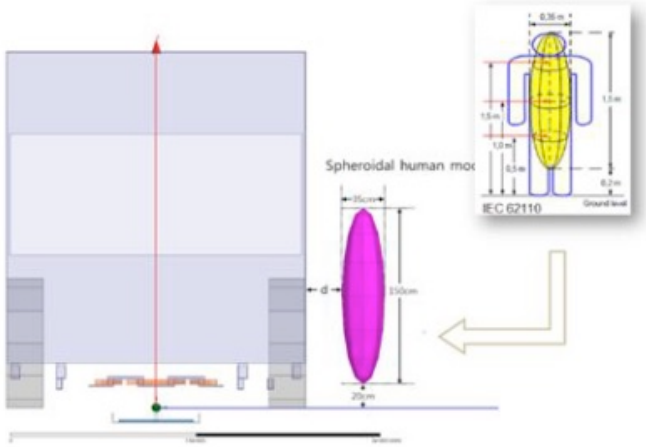


a) Photo



b) Structure and service area

K Suppl.20(20)_F01

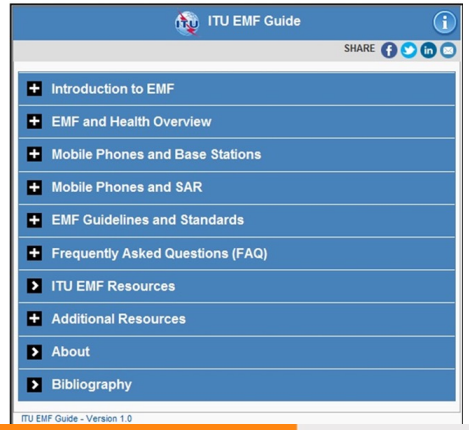


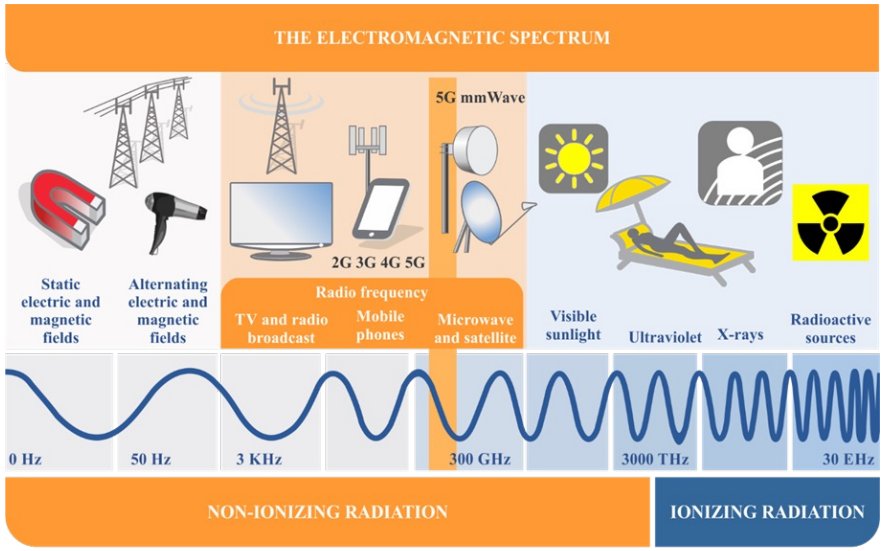
K Suppl.1(20)_F05

K Suppl.19(19)_F01

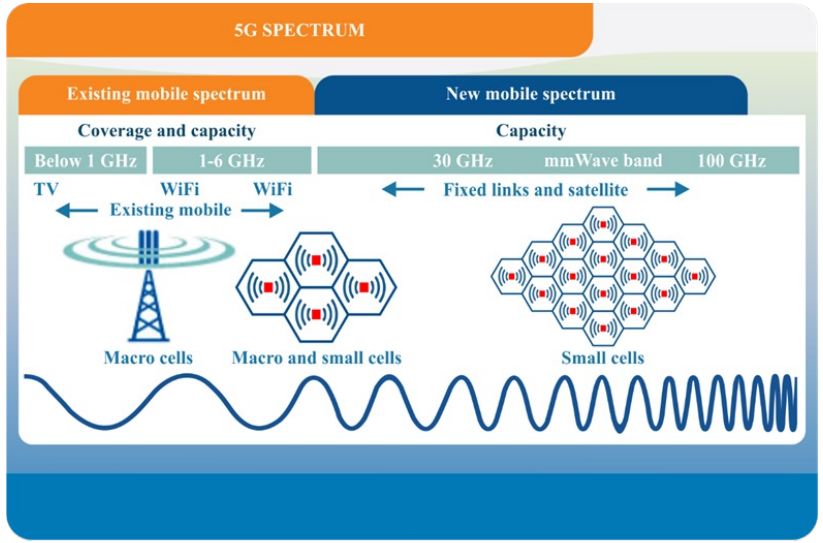
Q3/5 Informative documents: EMF-Guide: mobile App

- Promotes RF EMF information and education resources, available in 6 languages
- Provides the most useful information in helping to clarify uncertainties concerning EMF

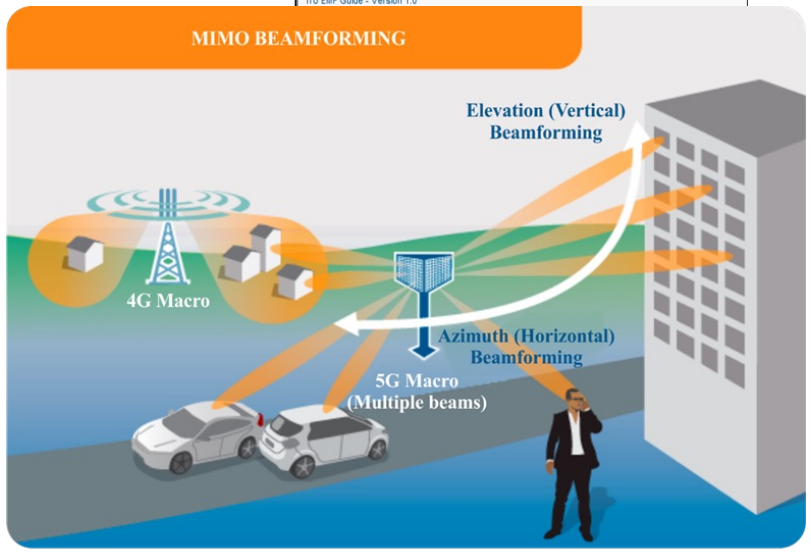




K Suppl.1(20)_F01

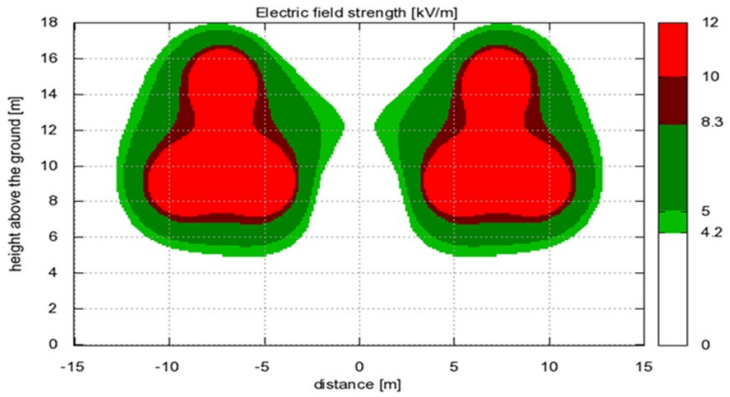


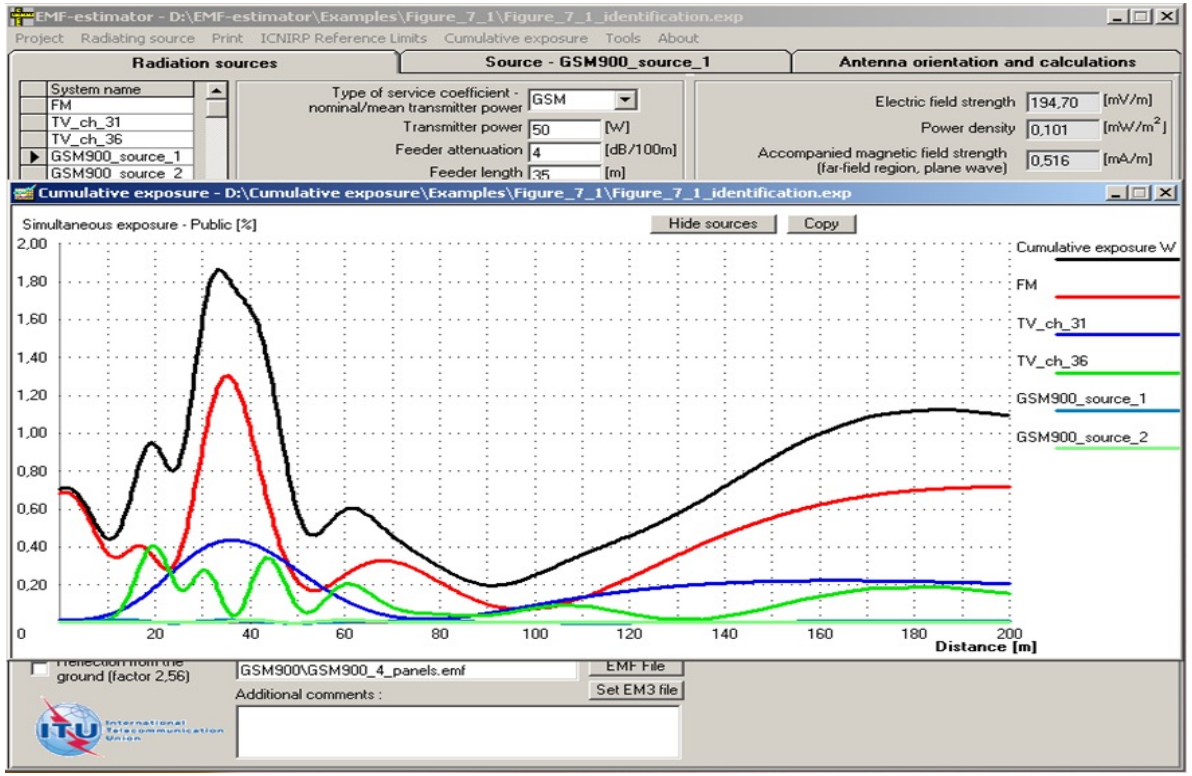
K Suppl.1(20)_F10



K Suppl.1(20)_F11

ITU-T Q3/5 – software tools (EMF-estimator, EMFACDC, …)





Thank you!

Questions? Interested in learning more?
Let us know!

Email

tsbsg5@itu.int

Website

SG5: Environment, EMF & circular economy

ITU-T Recommendations in force

ITU-T Rec. Number	Title	Year
K.52	Guidance on complying with limits for human exposure to electromagnetic fields	2021
K.61	Guidance to measurement and numerical prediction of electromagnetic fields for compliance with human exposure limits for telecommunication installation	2018
K.70	Mitigation techniques to limit human exposure to EMF's within vicinity of radiocommunication stations	2020
K.83	Monitoring of the electromagnetic field levels	2024
K.90	Evaluation techniques and working procedures for compliance with exposure limits of network operator personnel to power-frequency electromagnetic fields	2018
K.91	Guidance for assessment, evaluation and monitoring of the human exposure to radio frequency electromagnetic fields	2022
K.100	Measurement of human exposure levels when a wireless installation is put into service	2021
K.113	Generation of radiofrequency electromagnetic fields (RF-EMF) level maps	2015
K.121	Guidance on the Environmental Management for Electromagnetic Radiation from Radiocommunication Base Stations	2018
K.122	Exposure levels in the close proximity of the radiocommunication antennas	2016
K.145	Assessment and management of compliance with RF EMF exposure limits for workers at radiocommunication sites and facilities	2020
K.153	Guidance on determining the compliance boundaries (exclusion zones) of radio transmitter installations	2023

ITU-T Supplements in force

Work item	Title	Year
K Suppl. 1 to K.91	Guide on electromagnetic fields and health	2021
K. Suppl. 4 to K.91	Electromagnetic field considerations in smart sustainable cities	2018
K Suppl. 9	5G technology and human exposure to RF EMF	2019
K Suppl. 13	Radiofrequency electromagnetic field (RF-EMF) exposure levels from mobile and portable devices during different conditions of use	2021
K Suppl. 14	The impact of RF-EMF exposure limits stricter than the ICNIRP or IEEE guidelines on 4G and 5G mobile network deployment	2019
K Suppl. 16	Electromagnetic field (EMF) compliance assessments for 5G wireless networks.	2022
K Suppl. 19	Electromagnetic field (EMF) strength inside underground railway trains	2019
K Suppl. 20	RF Exposure evaluation around base station installed underground	2021
K Suppl. 29	EMF strength inside and outside of electric vehicle using wireless power transfer (WPT) technology	2022
K Suppl. 32	Case studies of radio frequency- electromagnetic field (RF-EMF) assessment	2023

ITU-T documents under development

ITU-T Rec. Number	Title	Year
K.devices	RF EMF exposure assessment of the wireless radiocommunication devices operating close to the human body	2024
K.peak	Comparison between peak and real exposure in the long-term considerations	2024
K.reflection	Impact of the metallic structures for the EMF exposure level	2024
K.Small	Small base stations - impact on the overall exposure level	2024
K.AI&EMF	EMF evaluation method using artificial intelligence in vicinity of 5G NR (IMT-2020) base station	2026
K.Suppl. MethDataEMF	Guidance on Methodologies for RF-EMF Assessments and Responding to Public Concerns regarding human exposure to RF-EMF from Telecommunication Installations	2026