



Commission K Triennial Report 2021-2023

Koichi Ito, Chair

Francesca Apollonio, Vice-Chair

Kensuke Sasaki, Early Career Representative

Emily Porter, Early Career Representative

1. Overview of the report

The report overviews the following items in the last two years:

- (1) Scientific domains of activities and interests
- (2) List of Commission Officers and Technical Advisory Committee members
- (3) Contributions to the Radio Science Bulletin (RSB)
- (4) Contributions to the Radio Science Letters (RSL)
- (5) Contributions to AT-AP-RASC 2022
- (6) Sponsoring scientific meetings
- (7) Preparations for GASS2023, August 2023, Sapporo, Japan
- (8) Election for the Triennium 2023-2026

2. Scientific domains of activities and interests

As described in the URSI Commission K website, the Commission is charged with promoting research and development in the following domains:

- Physical interaction of electromagnetic fields (from static to optical) with biological systems;
- Biological effects of electromagnetic fields;
- Mechanisms underlying the effects of electromagnetic fields;
- Exposure systems of experimental electromagnetic fields;
- Assessment of human exposure to electromagnetic fields;
- Medical applications of electromagnetic fields.



These Terms of Reference have not been updated since 2008. We started discussing a necessary update at the Commission Coordinating Activities meetings during URSI GASS 2021. The Commission Technical Advisory Committee has intensively discussed and carefully drafted the update. The drafted update will be sent to the Commission K Official Members in May 2023 for their additional comments/suggestions. Once finalized, updated Terms of Reference will be proposed to the URSI Secretariat for approval at the URSI Council Meeting to be held during GASS 2023.

3. List of Commission Officers and Technical Advisory Committee members

<Commission Officers>

Chair:

Koichi Ito

Chiba University, Japan

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Vice-Chair:

Francesca Apollonio

Sapienza University of Rome, Italy

E-mail: francesca.apollonio@uniroma1.it

Early Career Representatives:

Kensuke Sasaki

NICT, Japan

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Emily Porter

University of Texas at Austin, USA

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<Technical Advisory Committee>

The major roles of the Commission K Technical Advisory Committee are supposed to advise Commission Officers on essential issues relevant to the Commission, to help make up scientific programs of URSI flagship conferences, to promote contributions to the flagship conferences, and to help review papers contributed. The following members were appointed at the last Commission Coordinating Activities meeting held during GASS 2021.



Koichi Ito (Japan) <Chair>
Francesca Apollonio (Italy) <Vice-Chair>
Kensuke Sasaki (Japan) <ECR>
Emily Porter (USA) <ECR>
Joe Wiart (France) <immediate past Chair>
Puyan Mojabi (Canada) <immediate past ECR>
Michal Cifra (Czech Republic)
Lourdes Farrugia (Malta)
Lars Ole Fichte (Germany)
Niels Kuster (Switzerland)
Alexandre Legros (Canada)
Micaela Liberti (Italy)
Lluis Mir (France)
Frank Prato (Canada)
Masao Taki (Japan)
Vijayalaxmi (USA)
Jianqing Wang (Japan)
Tongning Wu (China)
Maxim Zhadobov (France)

4. Contributions to the Radio Science Bulletin (RSB)

Associate Editor:

Emily Porter (USA) has served as an associate editor.

Publications in RSB:

- “Ultra-Low Power System for Atrioventricular Synchronization Using Leadless Pacemakers” by Mirko Maldari, Chadi Jabbour, Youcef (March 2021)
- “Weaponizing the Microwave Auditory Effect and the Havana Syndrome” by James C. Lin (March 2021)
- “A 3D Microwave-Imaging System for Brain Stroke Follow-Up: Review and Experimental Testing” by Jorge A. Tobon V. (June 2021)
- “Safety Guidelines and 5G Communication RF Radiation” by James C. Lin (June 2021)



5. Contributions to the Radio Science Letters (RSL)

Associate Editor:

Kensuke Sasaki (Japan) has served as an associate editor.

Publications in RSL:

Following 9 papers related to the Commission K topics have been published in the RSL:

- Atsushi Saito, "Fabrication of a Miniature Figure-of-Eight Coil for Micromagnetic Stimulation on Neuronal Tissue," DOI: 10.46620/21-0008
- Yuto Shimizu, Kensuke Sasaki, and Tomoaki Nagaoka, "Design of Coaxial Sensor for Dielectric Measurement of Biological Tissues Below 100 MHz Frequency Range," DOI: 10.46620/21-0040
- Peter Jeschke, Carsten Altek"oster, Ingo B"ommels, Kai Jagielski, Corinna Becker, and Mathias Hoffmann, "Implementation of 2013/35/EU in Germany: Risk Assessment Based on Exposure Limit Values," DOI: 10.46620/21-0028
- A. De Angelis, L. Caramazza, F. M. Andre, C. Merla, L. M. Mir, F. Apollonio, and M. Liberti, "Gaps and Challenges in Microdosimetry: Improvements With Realistic Models of Endoplasmic Reticulum," DOI: 10.46620/22-0003
- Atsushi Saito, Shin Ohtani, Keiji Wada, Yukihisa Suzuki, Kenji Hattori, Akira Ushiyama, and Satoshi Nakasono, "Real-Time Detection of Neuronal Network Activity Under 85 kHz Band High-Intensity Intermediate Frequency-Magnetic Field Exposure," DOI: 10.46620/22-0012
- Brecht De Beelde, Arno Thielens, Reza Aminzadeh, and Wout Joseph, "On-Body Path Loss Modeling in the 110 GHz to 170 GHz Frequency Range," DOI: 10.46620/22-0063
- Kensuke Sasaki and Tomoaki Nagaoka, "Dielectric Modeling of Adipose Tissue as a Function of Water Content From 1 GHz to 100 GHz," DOI: 10.46620/22-0027
- Andrey S. Andrenko, Yuto Shimizu, and Tomoaki Nagaoka, "Specific Absorption Rate Measurement Method for Exposure Assessment and Conformity Evaluation of 2.45 GHz RF Wireless Power Transfer System," DOI: 10.46620/22-0062
- Shuhei Waki, Takuji Nishikawa, Takashi Hikage, and Manabu Yamamoto, "Interference Voltage Estimation for Implantable Cardiac Pacemaker Electromagnetic Interference at Fourth-Generation (4G) and Fifth-Generation (5G) Sub-6 GHz Cellular Frequency Bands," DOI: 10.46620/22-0047



6. Contributions to AT-AP-RASC 2022

At the 3rd URSI Atlantic and Asia Pacific Radio Science Meeting (AT-AP-RASC), held in Gran Canaria, Spain in 2022, Commission K had 12 sessions and 56 talks. Out of the 12 Sessions, 3 sessions have been organized in collaboration with the COST – My Wave, evidencing the good cooperation of the Action with Commission K. One session has been organized in collaboration with Commission B. The conference has been held in a hybrid format, with a good participation in presence for Commission K (more than 75%) with respect to online. The topics covered were related to:

- biological effects and related mechanisms of EMF;
- molecular targets in bioelectromagnetic interaction;
- dosimetry and exposure assessment;
- monitoring of EMF exposure;
- biomedical and therapeutic applications of EMF;
- biomedical imaging and healthcare and rehabilitative applications of EMF.

7. Sponsoring scientific meetings

During this period, Commission K has been involved in giving technical support to the following conferences:

- RADIO 2023
- APMC 2022
- ISAP 2022
- 2022 ICEAA-IEEE APWC dual conference
- URSI-JRSM (Japan Radio Science Meeting) 2022
- BioEM 2022
- EuCAP 2022
- 2021 IEEE AP-S/URSI Conference
- Czech National Committee Radio Science Workshop
- ISAP 2021
- Bioelectrodynamics Webinars (Czech Republic)



8. Preparations for GASS2023, August 2023, Sapporo, Japan

The preparation for the GASS 2023 in Sapporo will be successfully done with 17 Commission K topics and 6 joint topics with partner Commissions A, B, D, and E. At this moment, 155 accepted papers are allocated to oral and poster presentations on-site and video presentations are organized in virtual conference viewers for authors who will be unable to attend the conference on-site. A tutorial lecture will be given by Prof. Alessandra Costanzo (Italy).

Moreover, Commission K has been involved in the organization of the first URSI "Radio Science School for Young Scientists" to be held in Sapporo during the URSI GASS 2023.

9. Election for the Triennium 2023-2026

Election of Vice-Chair

Two candidates have been nominated. Currently, the Commission Official Members are requested to vote on the candidates using the online tool. Voting will be closed right after the first Commission Coordinating Activities meeting to be held during GASS 2023.

Election of Early Career Representative

Two candidates have been nominated. Currently, the Commission Official Members are requested to vote on the candidates using the online tool. Voting will be closed right after the first Commission Coordinating Activities meeting to be held during GASS 2023.